APPENDIX 6

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

SILVER CITY
ENERGY STORAGE

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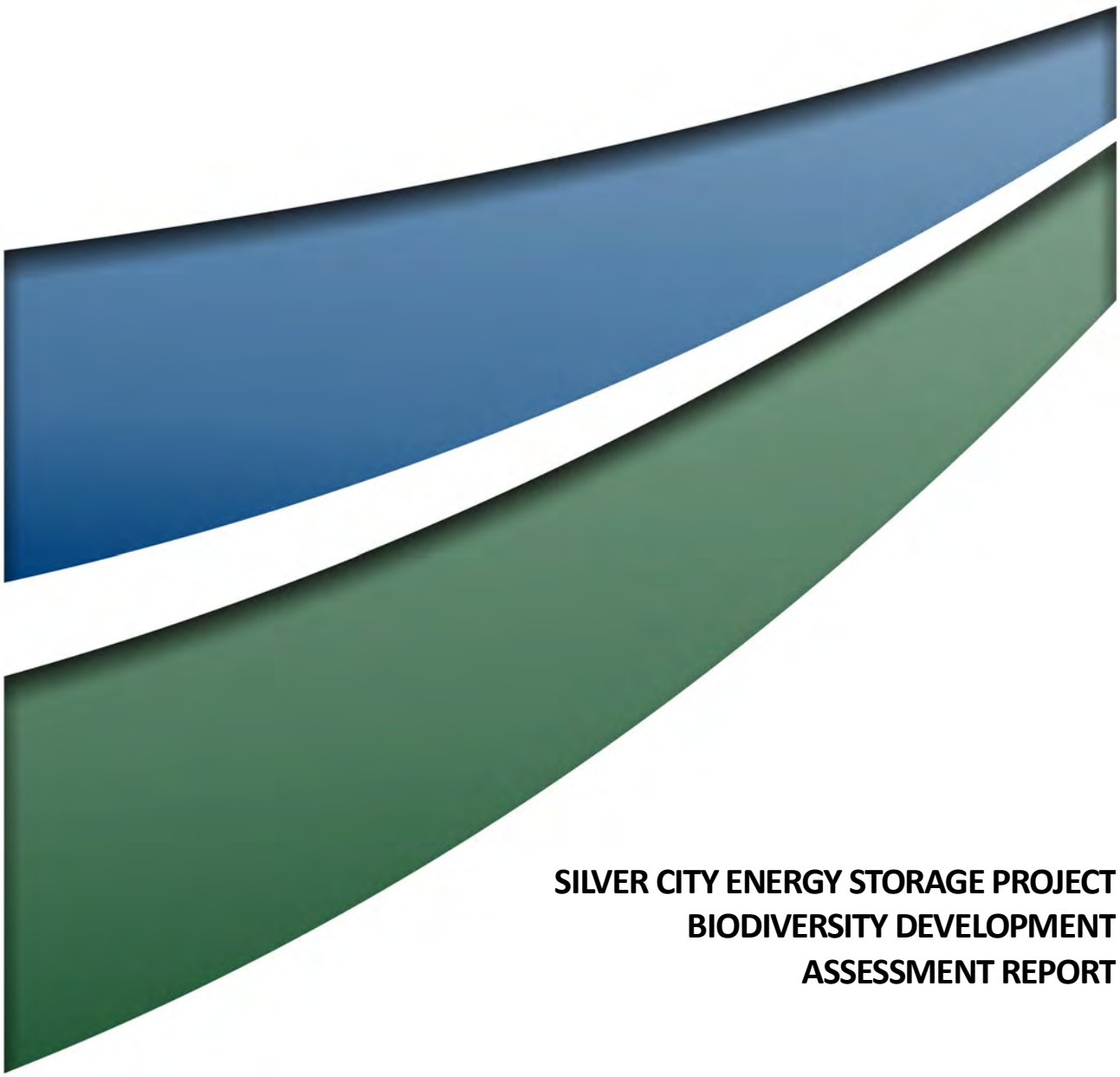

SILVER CITY ENERGY STORAGE PROJECT
BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

FINAL

August 2023

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
A-CAES NSW Pty Ltd

Project Director:	John Merrell
Project Manager:	Penelope Williams
Technical Director:	Shaun Corry
Technical Manager:	Ryan Parsons
Report No.	21982/R04
Date:	August 2023

umwelt
Environmental & Social Consultants

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	Ryan Parsons John Merrell	10 August 2023	John Merrell	10 August 2023

Executive Summary

A-CAES NSW Pty Ltd (the Proponent) engaged Umwelt to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed Silver City Energy Storage Facility (SCES facility) (the Project) co-located within the Potosi Mine, approximately 3 km north-east of Broken Hill.

The Project will involve the establishment of an Advanced Compressed Air Energy Storage Facility (A-CAES) facility to provide large-scale, long duration energy storage for the National Energy Market (NEM) and provide backup supply for the Broken Hill electricity network. The Project will include the construction of a 250,000 m^3 underground storage cavern (forming civil excavation works). The Project will utilise the existing Potosi Mine infrastructure access to construct the cavern.

The Subject Land of the Project, being the disturbance area within the broader Project Area, is approximately 47.61 hectares (ha). Following advice from BCD, the Subject land has been assessed as two separate BAM calculator cases, one as a standard development (SCES facility) (31.68 ha) and the associated Transmission Line as a linear development (15.93 ha).

This BDAR has been prepared by Umwelt for A-CAES NSW to assess the potential biodiversity impacts of the Project in accordance with the NSW Biodiversity Assessment Method (BAM).

Surveys identified the following Plant Community Types (PCTs) and vegetation:

Plant Community Type (PCT)	Area (ha)	
	SCES Facility	Transmission Line
PCT 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone	-	0.62
PCT 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion	5.21	4.14
PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone	3.45	0.20
PCT150 Bottlewasher – Copperburr grassland of the arid zone	-	1.05
PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones	22.40	8.64
PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)	-	0.38
Cleared and Planted Street Trees	0.63	0.89
Total	**31.68***	**15.93***

*note minor rounding discrepancies on totals.

No candidate threatened species credit species were recorded within the Subject Land. The completion of surveys and assessments identified the following threatened ecosystem credit species:

- Redthroat (*Pyrrholaemus brunneus*)
- Little Eagle (*Hieraaetus morphnoides*)
- Spotted Harrier (*Circus assimilis*)
- White-fronted Chat (*Epthianura albifrons*)
- Bolam's Mouse (*Pseudomys bolami*)
- Stripe-Faced Dunnart (*Sminthopsis macroura*).

Impact to biodiversity has been avoided as far as practicable through detailed design and refinement of the proposed disturbance area. Vegetation clearing along the easement associated with the Transmission Line will be contained to the disturbance area and specific locations where vegetation extends above 10 m in height. The vegetation in the remainder of the easements will be unaffected. Monopoles have also been selected to construct the transmission line, the narrow tubular design reduces the materials and footing size required for construction substantially in comparison to alternate tower designs.

Following the application of avoidance and mitigation measures, the following biodiversity credits are required to offset the impacts of the Project. It should be noted that the credit list below identifies a range of species-credit species which have been assumed present in areas where targeted surveys have not been completed. These species have been surveyed across the majority of the Subject Land; however, minor design changes post the completion of relevant seasonal surveys have resulted in changes to the Project Area associated with the Project and further seasonal surveys are proposed to be completed during spring to confirm presence or absence of these species from the added area.

Entity	Credits Required	
	SCES Facility	Transmission Line
PCT 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone	-	11
PCT 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion	111	69
PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone	71	4
PCT150 Bottlewasher - Copperburr grassland of the arid zone	-	13
PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones	300	294
PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)	-	11
Mallee Golden Wattle (assumed present) *Acacia notabilis*	2	-
Creek Wattle (assumed present) *Acacia rivalis*	3	-

Entity	Credits Required	
	SCES Facility	Transmission Line
Showy Indigo (assumed present) *Indigofera longibractea*	6	-
Yellow-Keeled Swainsona (assumed present) *Swainsona flavicarinata*	193	-
Slender Darling Pea (assumed present) ***Swainsona murrayana***	129	-
Creeping Darling Pea (assumed present) ***Swainsona viridis***	282	-

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Abbreviations

Abbreviation	Definition
BAM	Biodiversity Assessment Methodology
BC Act	NSW Biodiversity Conservation Act 2016
BCD	Biodiversity Conservation Division
BDAR	Biodiversity Development Assessment Report
CEEC	Critically Endangered Ecological Community
DCCEEW	Department of Climate Change, Energy, Environment and Water (formerly DAWE)
DNG	Derived Native Grasslands
DPE	Department of Planning and Environment (formerly DPIE)
DPIE	NSW Department of Planning, Industry and Environment
Ecosystem credit	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur within a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at an offset site.
EEC	Endangered Ecological Community
EP	Endangered Population
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
Ha/s	Hectare/s
GIS	Geographical Information System
IBRA	Interim Biogeographic Regionalisation for Australia (Version 7)
LGA	Local Government Area
LLS Act	Local Land Services Act 2013
MGA	Map Grid of Australia
NSW	New South Wales
OEH	NSW Office of Environment and Heritage (now BCD)
PCT	Plant Community Type
PMST	Protected Matters Search Tool
Project Area	The broader area subject to detailed surveys prior to detailed design and the area subject to the Development Application for the Project.
SAII	Serious and Irreversible Impact
SEARs	DPE Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
Species credit	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates.
Strahler Stream Order	Classification system that gives a waterway an 'order' according to the number of tributaries associated with it.
Subject Land	The proposed area within the broader Project Area that will be disturbed by the Project is referred to throughout this report as the Subject Land in accordance with the BAM

Abbreviation	Definition
SCES Facility (SCES)	Silver City Energy Storage Facility. This part of the Project is assessed as a standard development.
Transmission Line	Proposed 220 kV electricity connection and associated powerline (approximately 16 km long). This part of the Project is assessed as a linear development.
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VIS	Vegetation Information System

Declarations

Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).		
Name:	Ryan Parsons	Shaun Corry
Signature:		
Date:	10 August 2023	10 August 2023
BAM Assessor Accreditation No:	BAAS17048	BAAS17048

Details and experience of author/s and contributors

This BDAR was prepared by Ryan Parsons (Principal Ecologist) (BAM Accreditation BAAS17048) and Shaun Corry (Principal Ecologist) (BAM Accreditation Number BAAS17041). Field surveys were undertaken by Belinda Howe, Shaun Corry, Ryan Parsons and a number of other Umwelt ecologists under the guidance of the accredited assessors (refer to table below).

This BDAR was finalised on 10 August 2023 and the BAMC was submitted to the authority within two weeks of the report submission for exhibition as part of the Environmental Impact Statement for the Project. **Appendix F** provides an assessment of compliance with the BAM 2020.

Name	BAM Assessor Accreditation no.	Position/Role	Tasks performed	Relevant qualifications
Shaun Corry	BAAS17041	Principal Ecologist	Biodiversity Surveys, BDAR preparation and BDAR review, and Technical Direction	Bachelor of Science (Biology) Ecological consultant for 15 years
Belinda Howe	BAAS21019	Senior Ecologist	Biodiversity surveys and BDAR preparation	Bachelor of Environmental Science and Management (Hons 1) Ecological Consultant for 5 years
Ryan Parsons	BAAS17048	Principal Ecologist	Biodiversity surveys, PCT Analysis and Review, BDAR preparation and review, and Technical Direction	Bachelor Environmental Science and Management (Hons) Ecological consultant for 15 years
Lachlan Laurie	BAAS18011	Principal Ecologist	Biodiversity surveys	Certificate IV Workplace Training and Assessment Advanced Plant Identification for Research and Development UNSW Farming Small Areas Certificate NSW TAFE
Alexandra Cottle	N/A	Ecologist	Biodiversity surveys	Bachelor Environmental Science and Management

1.0 Introduction

1.1 Background Information

A-CAES NSW Pty Ltd engaged Umwelt, to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed Silver City Energy Storage facility (SCES Facility) (the Project) co-located at the Potosi Mine, located approximately 3 km north-east of Broken Hill.

This BDAR has been prepared as part of the Environmental Impact Statement (EIS) for the Project to address the Secretary's Environmental Assessment Requirements (SEARs) in relation to biodiversity. This Report provides an assessment of the biodiversity values of the Subject Land, documents the application of the avoid, minimise and offset framework and assesses the likely biodiversity impacts of the Project.

This BDAR has been prepared in accordance with the *Biodiversity Conservation Act 2016* (BC Act) and the Biodiversity Assessment Method (BAM) (DPIE 2020a). The Project is a State Significant Development (SSD) under Division 4.7 of Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Project was determined to not be a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). No further assessment under the EPBC Act is required.

1.2 Proposed Development

1.2.1 Location and Subject Land Description

The Project is located approximately 3 km northeast of Broken Hill township which is within the Broken Hill Local Government Area (LGA) of New South Wales (NSW). For the purposes of this report two areas will be referred to throughout: the Project Area and the Subject Land. The Project Area is the larger boundary where Umwelt focused the Biodiversity Assessment. The Subject Land is the smaller boundary, this is the land subject to development as part of the Project. The Subject Land is the area subject to disturbance, within the Project Area, will hereafter be referred to as the Subject Land.

Following advice from BCD, the Subject Land has been assessed as two separate developments in the BAM calculator. The SCES Facility as a standard development and the associated Transmission Line as a linear development, for the purposes of the report, these are referred to as the following:

- SCES Facility.
- Transmission Line.

The boundary for both the Project Area and Subject Land is shown on the Site Map provided as **Figure 1.1** and the Location Map, provided as **Figure 1.2**.

The Project Area is situated within the Broken Hill Complex Interim Biogeographic Regionalisation for Australia (IBRA), and the Barrier Range sub-region. The most proximate national park (NP), state park or Conservation Reserve is the Boolcoomatta Conservation Reserve (located in South Australia), situated approximately 69 km to the west. Following this, Kinchega National Park is located approximately 84 km to the southeast and Mutawintji National Park is located approximately 100 km to the northeast of the Project Area.

The Project Area encompasses land owned by Perilya Pty Ltd, one privately-owned property, two private lease holding of Crown Land, and areas of Crown Land. Land within and surrounding the Subject Land has been subject to historic disturbance, including mining activities, rubbish dumping and vegetation clearing.

1.2.2 Development Overview

The Project involves the construction of the SCES facility at Potosi Mine approximately 3 km northeast of Broken Hill, and associated Transmission Line (refer to **Figure 1.3**). The Project includes:

- Establishment of an advanced compressed air energy storage (A-CAES) facility and associated surface infrastructure to provide large-scale, long duration energy storage for the National Energy Market (NEM) and provide backup supply for the Broken Hill electricity network.
- Establishment of an approximately 250,000 m^3 underground cavern (forming civil excavation works), including a partly utilising existing mine workings and the existing Silver Peak or Potosi Mine portals for subsurface access.
- Construction and use of:
    - a new surface infrastructure site, including an approximately 350 megalitre water storage reservoir, air shaft, water shaft and sump, turbines, compressors, heat storage spheres, an office, laydown area and switchyard and associated access road off the Flying Doctor Haul Road, along with associated facilities
    - a new 220 kV transmission line that has been designed with sections of both overhead and underground line with the overhead line designed at a varying height. The Subject Land comprises disturbance associated with:
        - Access tracks
        - Pole locations
        - Laydown areas
        - Ancillary infrastructure, passing lanes and turning points
        - Maintenance (i.e., trimming) of areas of vegetation taller than 10 metres in height within the easement for the transmission line.
    - Creek diversion and raw water above-ground supply pipeline, connecting to the existing Stephens Creek Reservoir to Broken Hill raw water pipeline.

1.2.3 Previous Ecological Studies

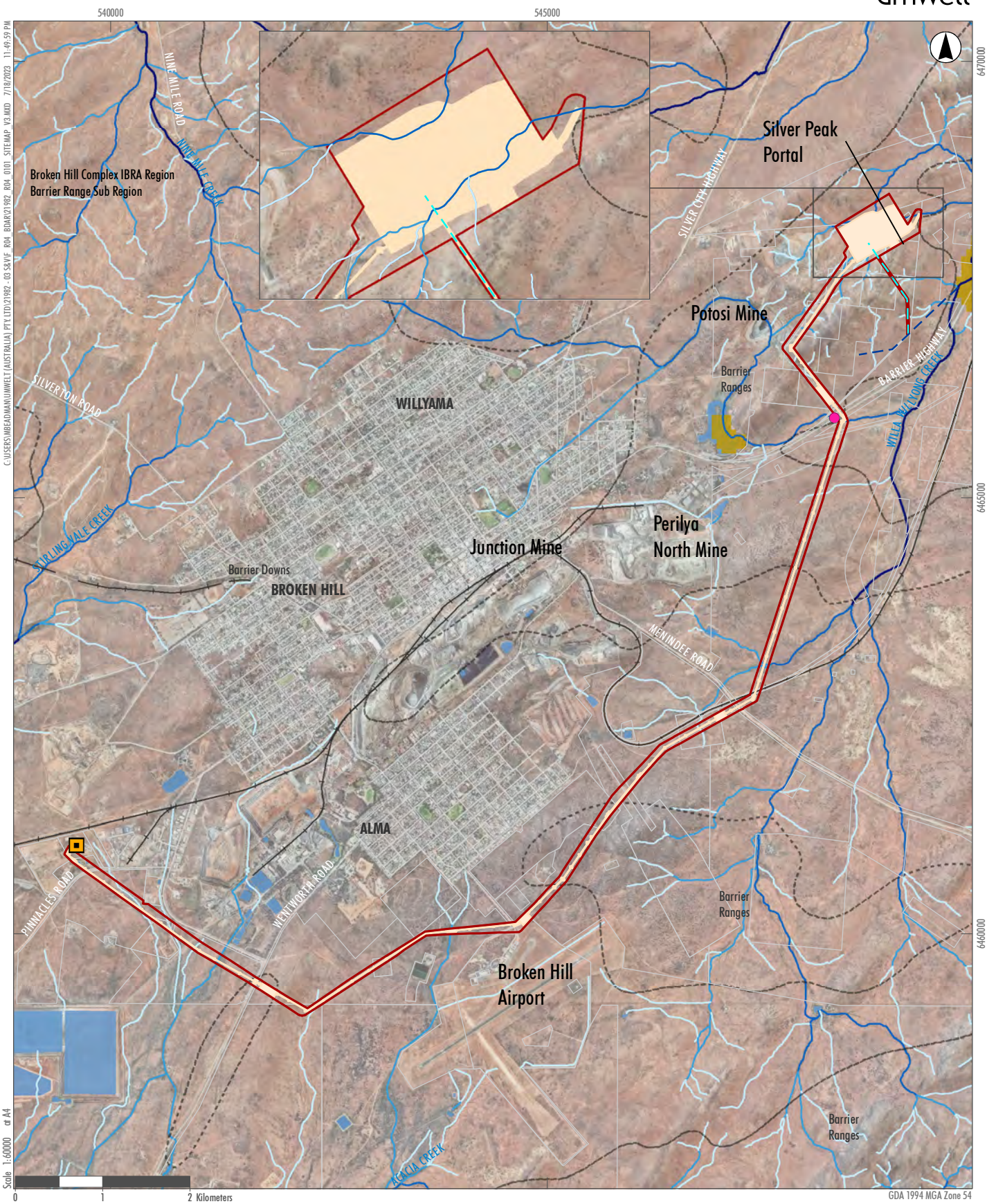
Several biodiversity studies have been completed in proximity to the Project Area. Below is a selected list of assessments relevant to this BDAR. These are:

- Delta Environmental Consulting (2008). Flying Doctor Project Broken Hill: Flora Assessment. Report prepared on behalf of Perilya Broken Hill Limited.

- Environmental & Biodiversity Services (2008). Flying Doctor Project Broken Hill: Fauna Assessment. Report prepared on behalf of Perilya Broken Hill Limited.
- Pasminco Mining (1995) – Environmental Impact Statement: Potosi Project.
- Sinclair Knight Merz (SKM) (2012). Environmental Assessment: Broken Hill Solar Plant. Report prepared for AGL.
- Niche (2021). Biodiversity Development Assessment Report: Broken Hill Battery Energy Storage System Project. Report prepared for AGL Energy Limited.

1.2.4 Other Documentation

Other information sources relied upon are referenced in the text and are listed in the References **Section 12.0** of this Report.



Legend

- Project Area
- Subject Land
- Transgrid Substation
- Existing Stephens Creek Reservoir Water Pipeline (above ground section)
- Proposed Above Ground Water Pipeline
- Site Access Point
- Property Boundaries
- NSW (Mitchell) Landscapes
- Floodplain Wetland
- Waterbodies
- Railway Line
- Road

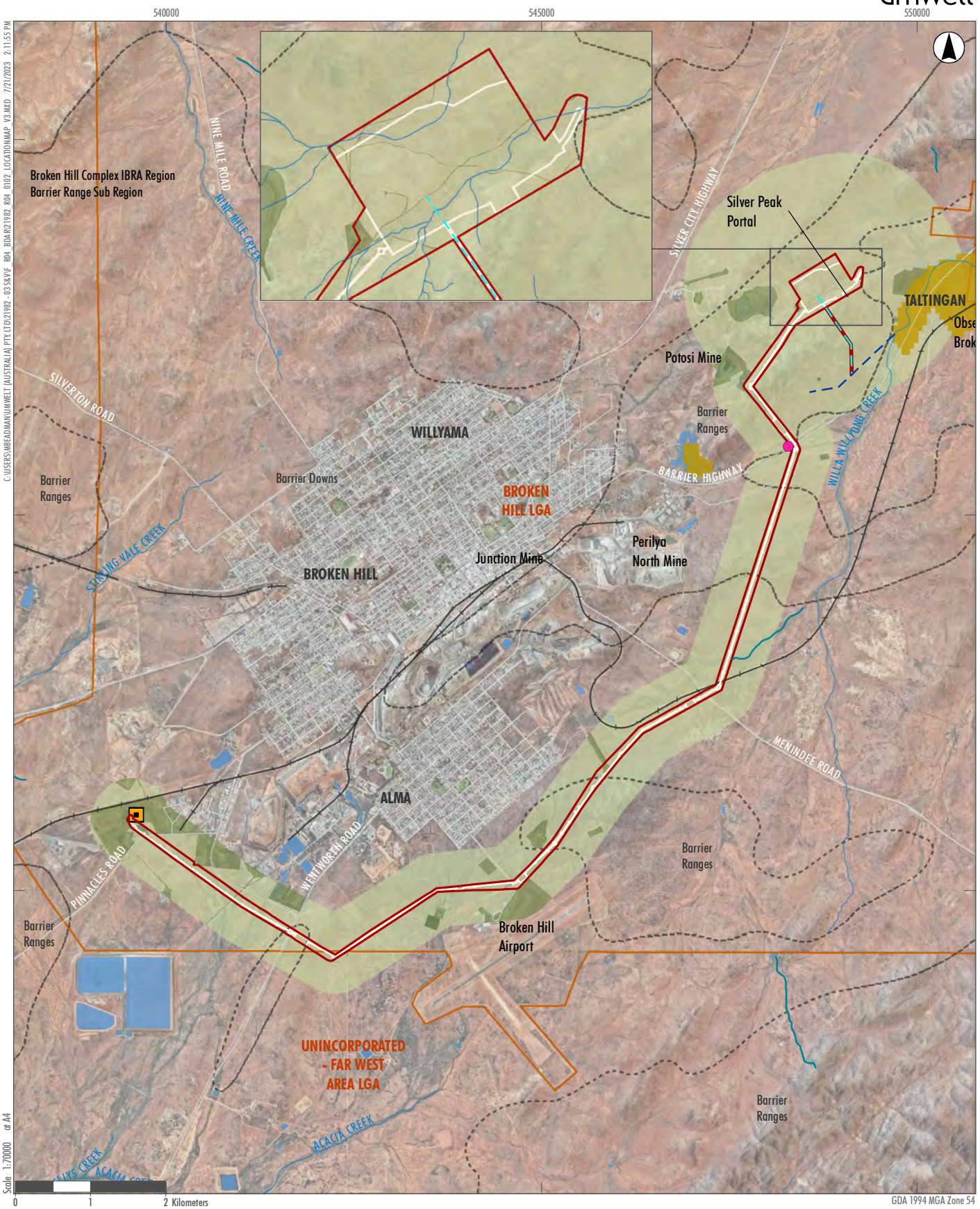
Strahler Stream Order

- 1
- 2
- 3
- 4

FIGURE 1.1

Site Map

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



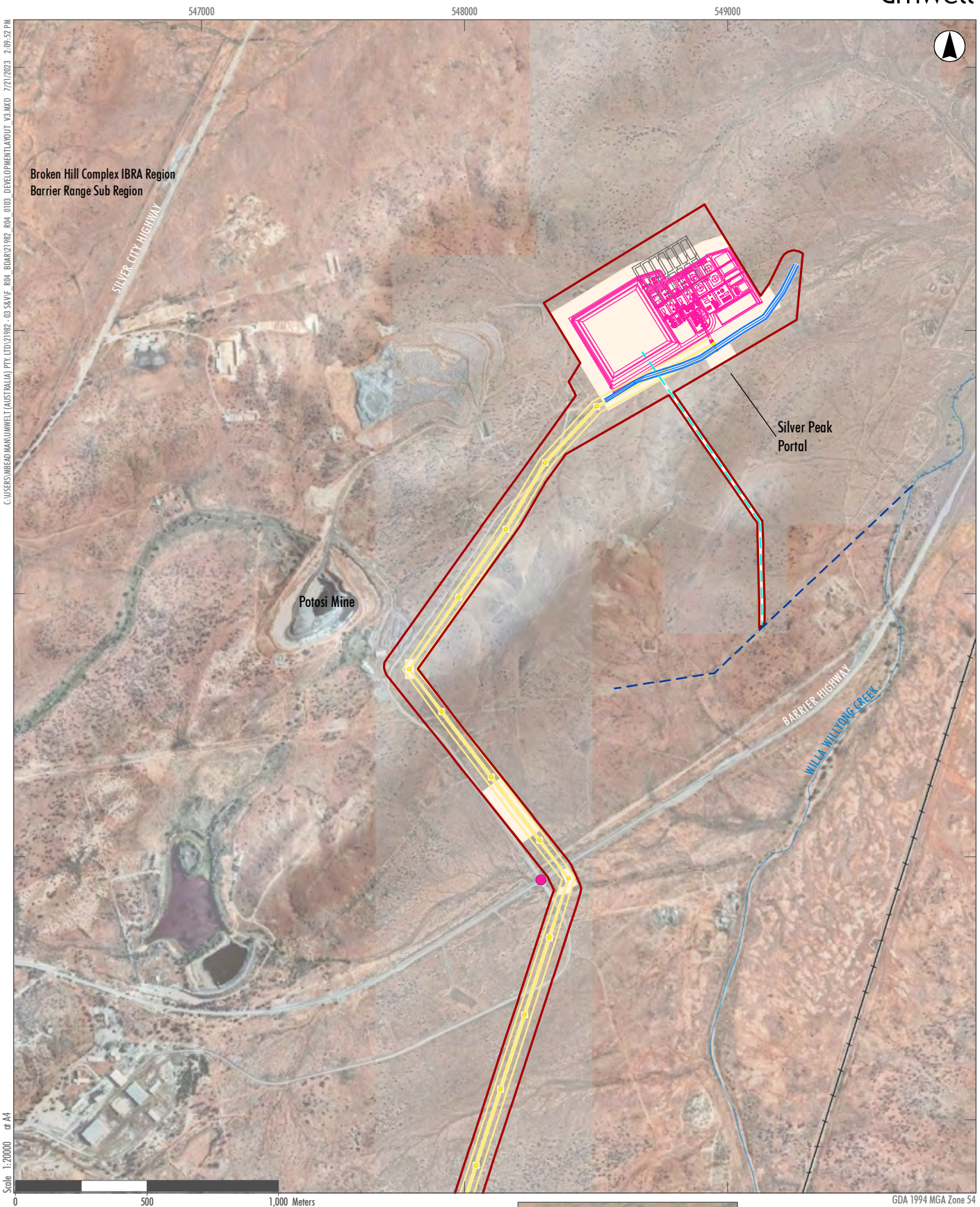
Legend

- Project Area
- Subject Land
- Transgrid Substation
- Existing Stephens Creek Reservoir Water Pipeline (above ground section)
- Proposed Above Ground Water Pipeline
- Site Access Point
- Drainage Line
- Railway Line
- Road
- Local Government Area boundary
- NSW (Mitchell) Landscapes
- Floodplain Wetland
- Waterbodies
- Native vegetation within the assessment area
- Non-native vegetation within the assessment area

FIGURE 1.2

Location Map

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Silver City Energy Storage Facility
- Proposed Transmission Line (Above Ground Section)
- Underground Cavern
- Proposed Creek Diversion
- Existing Stephens Creek Reservoir Water Pipeline (above ground section)
- Proposed Above Ground Water Pipeline
- Site Access Point
- Drainage Line
- Railway Line
- Road

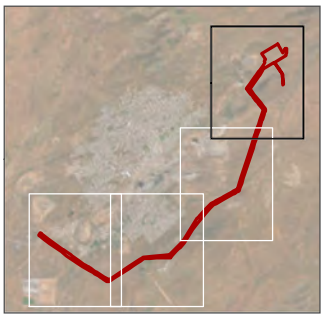


FIGURE 1.3A

Development Layout

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Proposed Transmission Line (Above Ground Section)
- Proposed Transmission Line (Underground Section)
- Drainage Line
- Railway Line
- Road

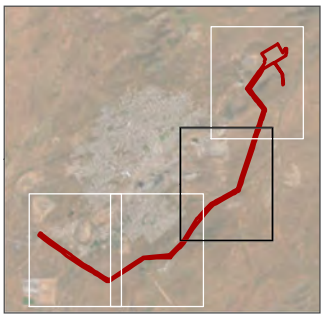


FIGURE 1.3B

Development Layout

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Proposed Transmission Line (Above Ground Section)
- Proposed Transmission Line (Underground Section)
- Railway Line
- Road

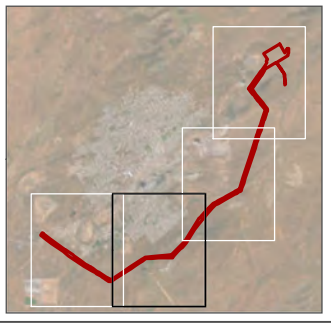


FIGURE 1.3C

Development Layout

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Proposed Transmission Line (Above Ground Section)
- Proposed Transmission Line (Underground Section)
- Transgrid Substation
- Railway Line
- Road

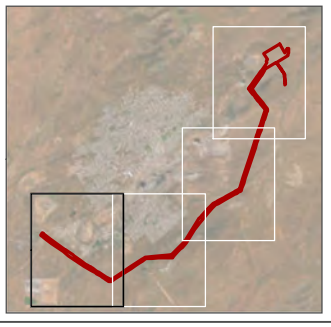


FIGURE 1.3D

Development Layout

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

1.3 Biodiversity Offset Scheme Entry

The biodiversity offset scheme (BOS) applies to all SSD projects and the SEARs require a BDAR to be prepared for the Project in accordance with Section 7.9 of the BC Act. Biodiversity Values (riparian areas) on the Biodiversity Values Map occur in the vicinity of the Subject Land, as shown in **Figure 1.4**.

1.4 Excluded Impacts

Clause 6.8(3) of the BC Act specifies that the BAM is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (as defined in Part 5A of the *Local Land Services Act 2013* (LLS Act), other than prescribed impacts (as defined in clause 6.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation)).

No land within the Subject Land is excluded from impacts.

1.5 Matters of National Environmental Significance

A referral was submitted to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 27 February 2023 and it was determined that the Project was not a controlled action (EPBC 2022/09415) on 20 June 2023. The referral considered the Proposed Action is unlikely to result in a significant impact to Matters of National Environmental Significance (MNES) listed threatened species, migratory species or threatened ecological communities (TECs) (Umwelt 2023) and this finding was confirmed when the Project was determined to not be a controlled action.

As the Project is not a Controlled Action under Section 75 of the EPBC Act, MNES have not, beyond that required by a BDAR, been further assessed in this report.

1.6 SEARs Requirements

A scoping report was prepared for the Project and SEARs were issued on 30 September 2022. **Table 1.1** details the SEARs (September 2022) provided by DPE relevant to this biodiversity assessment along with BCD recommended environmental assessment requirements.

Table 1.1 Biodiversity Specific SEARs and BCD Recommended Environmental Assessment Requirements

Requirements	Relevant Report Section
SEARs - Biodiversity	
Biodiversity – including: • an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 (NSW), the Biodiversity Assessment Method 2020 (BAM) and documented in a Biodiversity Development Assessment Report (BDAR), including a detailed description of the proposed regime for avoiding, minimising, managing and reporting on the biodiversity impacts of the development over time, and a strategy to offset any residual impacts of the development in accordance with the BC Act; required), and a description of the measures to minimise and rehabilitate impacts, including impacts to Willa Willyong Creek;	This Document

Requirements	Relevant Report Section
• an assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities scheduled under the Fisheries Management Act 1994 (if required), and a description of the measures to minimise and rehabilitate impacts, including impacts to Willa Willyong Creek;	**Appendix D**
• if an offset is required, details of the measures proposed to address the offset obligations.	**Section 11.0**
BCD Recommended Environmental Assessment Requirements	
Biodiversity impacts related to the proposed development are to be assessed in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 using the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the Biodiversity Conservation Act 2016 (s6.12), Biodiversity Conservation Regulation 2017 (s6.8) and the BAM, unless DPE determines that the proposed development is not likely to have any significant impact on biodiversity values.	This Document
The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the BAM.	**Section 7.0**
The BDAR must include details of the measures proposed to address the offset obligation as follows: • The total number and classes of biodiversity credits required to be retired for the development/project; • The number and classes of like-for-like biodiversity credits proposed to be retired; • The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules; • Any proposal to fund a biodiversity conservation action; • Any proposal to make a payment to the Biodiversity Conservation Fund. If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.	**Section 11.0**
The BDAR must be submitted with all spatial data associated with the survey and assessment as per Appendix 11 of the BAM.	Not part of this document, to be provided separately to DPE
The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the *Biodiversity Conservation Act 2016.*	Introduction to report.

1.7 Information Sources

The following key resources, policies and documents were used during the preparation of this BDAR:

- Biodiversity Assessment Method 2020 (DPIE 2020a)
- Biodiversity Assessment Method Operational Manual (Stage 1) (DPE 2022a)
- Biodiversity Assessment Method Operational Manual (Stage 2) (DPE 2023b)

- Biodiversity Assessment Method Calculator (BAMC)
- NSW Bionet (DPE 2023a) including:
    - BioNet Atlas,
    - Bionet Vegetation Database and
    - Threatened Species Data Collection, last accessed June 2023.
- Surveying Threatened Plants and Their Habitats (DPIE 2020b)
- Threatened reptiles Biodiversity Assessment Method survey guide (DPE) (2022b)
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (DCCEEW 2023), last accessed 22 May 2023.

Other information sources relied upon are referenced in the text and are listed in the References **Section 12.0** of this Report.

Legend

- Project Area
- Subject Land
- Transgrid Substation
- Drainage Line
- Railway Line
- Road
- Biodiversity Values

FIGURE 1.4

Biodiversity Values Map

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

2.0 Methods

The detailed methodology for all surveys undertaken as part of the biodiversity assessment is described in **Appendix A** and as directed by **Table 2.1** below.

Table 2.1 Biodiversity assessment methods for Silver City Energy Storage Facility

Methods Undertaken	Relevant Appendix A Section
Site Context Methods	**Section A1.1**
Landscape Features	Section A1.1.1
Native Vegetation, Threatened Ecological Communities and Vegetation Integrity Methods	**Section A1.2**
Existing Information	Section A1.2.1
Mapping Native Vegetation Extent	Section A1.2.2
Plot-based Vegetation Survey	Section A1.2.3
Vegetation Integrity Survey	Section A1.2.4
Rapid Vegetation Assessments	Section A1.2.5
Meandering Transects	Section A1.2.6
Digital Aerial Photo Interpretation	Section A1.2.7
Plant Identification and Nomenclature Standards	Section A1.2.8
Threatened Ecological Community Delineation	Section A1.2.9
Plant Community Type Allocation	Section A1.2.10
Threatened Flora Survey Methods	**Section A1.3**
Review of Existing Information	Section A1.3.1
Habitat Constraints Assessment	Section A1.4.2
Field Surveys	Section A1.4.3
Threatened Fauna Survey Methods	**Section A1.4**
Review of Existing Information	Section A.1.4.1
Habitat Constraints Assessment	Section A1.4.2
Field Surveys	Section A1.4.3
Threatened Fungi	Section A1.5
Weather Conditions	Section A1.6
Limitations	Section A1.7

3.0 Site Context

3.1 Project Area

3.2 Landscape Features

Landscape features identified within the Subject Land are shown on the Site Map provided as **Figure 1.1** and landscape features in the Project Area are shown on the Location Map provided as **Figure 1.2.** Further information on landscape features is provided in **Sections 3.2.1** to **3.2.7**.

3.2.1 IBRA Bioregions and IBRA Subregions

The Subject Land is located within the Broken Hill Complex Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and Barrier Range IBRA subregion.

3.2.2 Rivers, Streams, Estuaries and Wetlands

The locations of the streams within the Subject Land are shown on the Site Map provided as **Figure 1.1** and the locations of streams and rivers within and surrounding the Project Area are shown on the Location Map provided as **Figure 1.2**. Additionally, there are no Wetlands of International Importance within the Subject Land. The Project Area is located within the broader Darling River catchment and the Project surface facilities as located within the immediate catchment of Willa Willyong Creek which drains in a north-easterly direction to Stephens Creek Reservoir. NSW government hydroline mapping indicates that all streams within the Project Area and immediately downstream (including Willa Willyong Creek, Kellys Creek and Acacia Creek) are ephemeral. It is noted that the Project Area occurs within an arid region with low annual rainfall. As shown on **Figure 1.1**, Floodplain Wetland is mapped upstream and downstream of the Project Area according to NSW Wetlands mapping by DPE. The upstream occurrence is an artificial water storage area.

3.2.3 Habitat Connectivity

Figure 1.1 and **Figure 1.2** displays the habitat connectivity surrounding the Subject Land. It can be seen that the Subject land will not significantly interrupt habitat connectivity. The Transmission Line will continue to facilitate habitat connectivity given the low height of the majority of the vegetation.

3.2.4 Karst, Caves, Crevices, Cliffs, Rocks or Other Geological Features of Significance

Areas of exposed rocks with small crevices and rocky habitat (including small overhangs) were identified within the Project Area during surveys.

No significant geological features are expected to occur within the Subject Land.

3.2.5 Areas of Outstanding Biodiversity Value

The Subject Land and Project Area do not contain any areas of outstanding biodiversity value, as identified under the BC Act.

3.2.6 NSW (Mitchell) Landscapes

The Subject Land is mapped as occurring within the Barrier Downs and Barrier Ranges Mitchell Landscape.

3.2.7 Additional Landscape Features Identified in the SEARS

There are no specific additional landscape features identified for assessment in the SEARs.

3.3 Native Vegetation Cover

The native vegetation cover within the Project Area was determined through site surveys of the Subject Land and aerial photograph interpretation using GIS software, comprising esri satellite imagery (dated 2021) accessed in August 2022 and June 2023, with refinement based on a Nearmap aerial photograph dated 17 October 2022. As requested by BCD, the Subject Land has been split to allow the SCES facility to be assessed as a standard development and the Transmission Line as a linear project.

Table 3.1 and **Table 3.2** contains the extent of native vegetation cover within the buffer assessment area and **Figure 1.2** shows the extent of native vegetation cover within the buffer assessment area.

Table 3.1 Native Vegetation Cover in the Buffer Assessment Area – SCES Facility

Native Vegetation Cover	
1500m buffer Assessment Area (ha)	1012 ha
Total area of native vegetation cover (ha)	948 ha
Percentage of native vegetation cover (%)	94%
Class (0-10, >10-30, >30-70 or >70 %)	>70 %

Table 3.2 Native vegetation cover in the Buffer Assessment Area – Transmission Line

Native Vegetation Cover	
500m buffer Assessment Area (ha)	1668 ha
Total area of native vegetation cover (ha)	1481 ha
Percentage of native vegetation cover (%)	89%
Class (0-10, >10-30, >30-70 or >70 %)	>70 %

4.0 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

4.1 Native Vegetation Extent

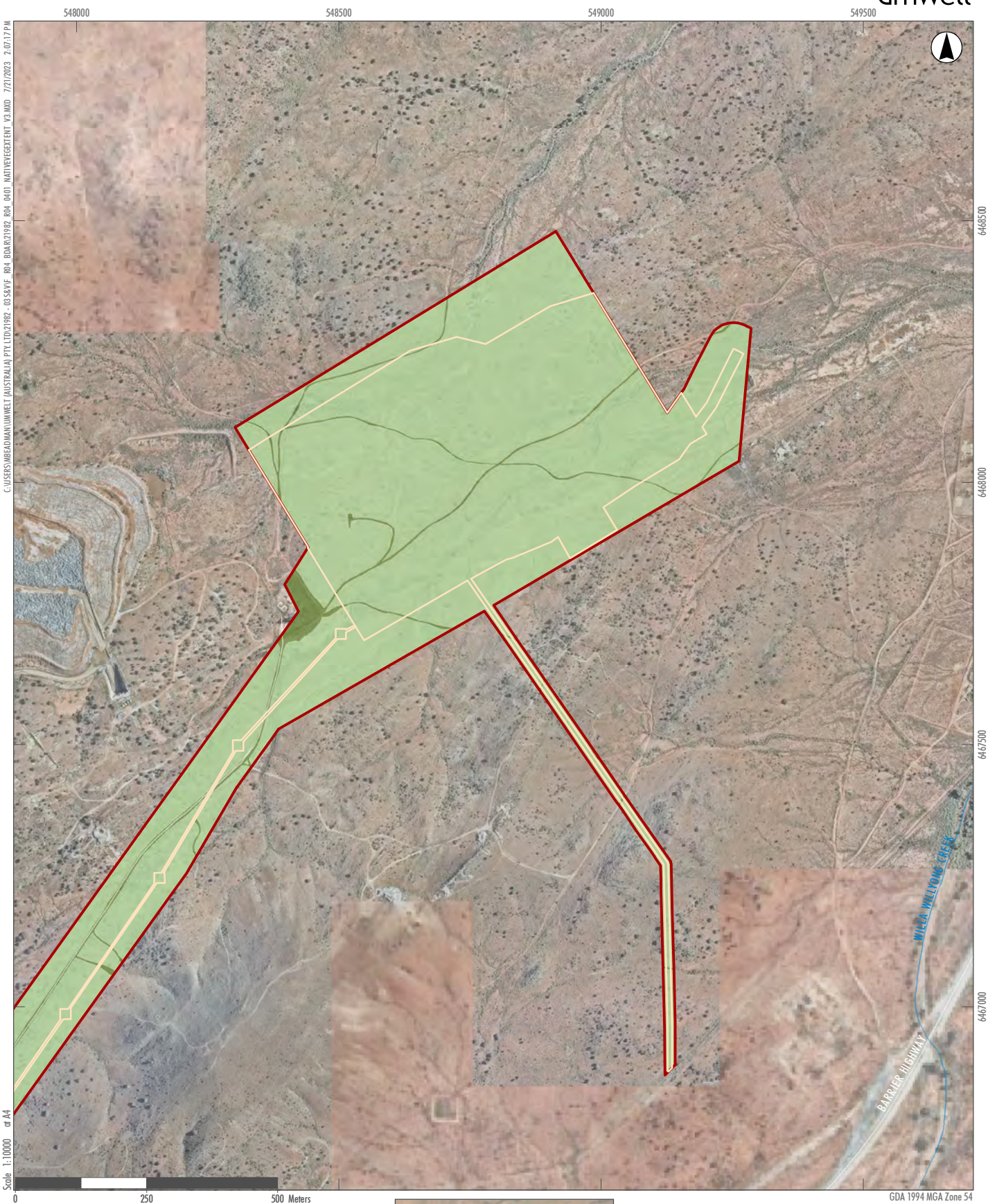
The parts of the Subject Land assessed as native vegetation for the purposes of the vegetation integrity surveys are shown in **Figure 4.1.** In addition, **Figure 4.1** displays the native vegetation mapped within the 500 m (Transmission Line) and 1,500 m (SCES Facility) buffers.

4.1.1 Changes to the Mapped Native Vegetation Extent

No notable changes were observed during surveys to the mapped native vegetation extent visible on the aerial imagery utilised for this assessment.

4.1.2 Areas that are not Native Vegetation

Areas of non-native vegetation cover were identified during desktop surveys as well as during site surveys. The Project Area contains areas of non-native vegetation, which includes areas of infrastructure, roads (sealed and unsealed), areas of historic mining disturbance, and areas of land where rubbish dumping is present. The creek lines throughout the Project Area generally have a high level of exotic flora species present.



Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

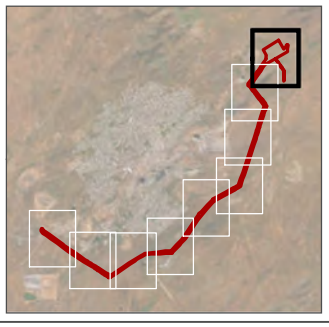


FIGURE 4.1A

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE 4.1B

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

FIGURE 4.1C

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

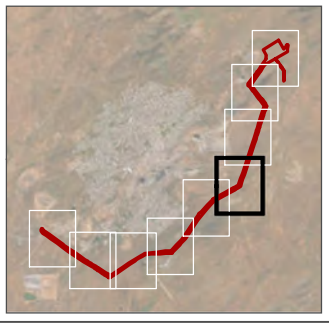


FIGURE 4.1D

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

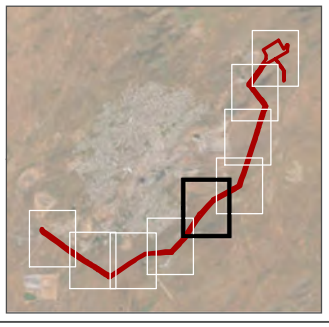


FIGURE 4.1E

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

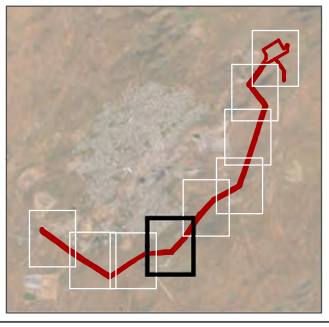


FIGURE 4.1F

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

FIGURE 4.1G

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

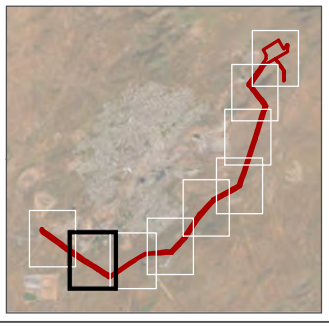


FIGURE 4.1H

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Native vegetation within the assessment area
- Not native vegetation within the assessment area

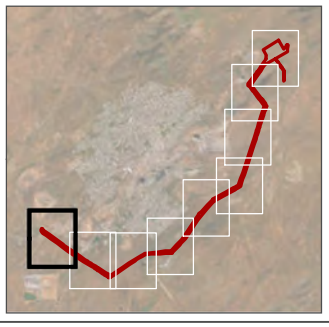


FIGURE 4.1I

Native Vegetation Extent

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

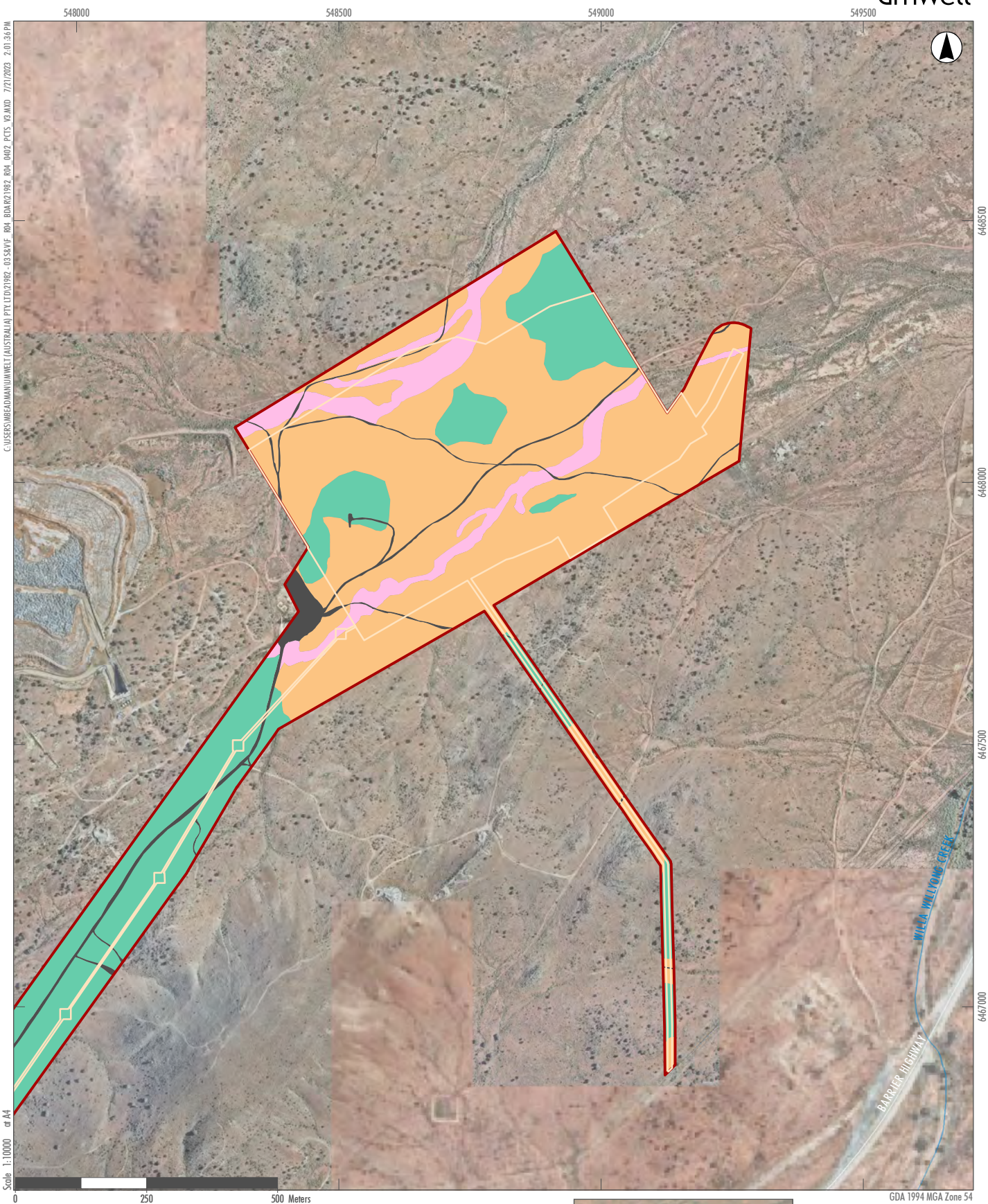
4.2 Plant Community Types

4.2.1 Overview

Vegetation within the Subject Land has been assessed as aligning with the BioNet VIS Classification Plant Community Types (PCTs) identified within **Table 4.1** and their extent is shown in **Figure 4.2.** The Subject Land has been divided in two BAM calculator assessments to account for a standard (SCES Facility) and linear development design (Transmission Line) and as such have been presented separately in **Table 4.1** below. Detailed descriptions of each PCT are provided in the following subsections.

Table 4.1 Plant community types identified within the Subject Land

PCT ID	Plant Community Type	Vegetation Zone and Condition	Area (ha) in Development		
			SCES Facility	Transmission	Total
41	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone	Derived Shrubland	0	0.05	0.05
41		High Weed Cover	0	0.47	0.47
41		Planted	0	0.11	0.11
123	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion	Dieback	0	0.22	0.22
123		Good	5.21	3.92	9.13
136	Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone	Disturbed – High Weed Cover	0	0.11	0.11
136		Good	3.45	0.09	3.54
150	Bottlewasher - Copperburr grassland of the arid zone	Good	0	1.05	1.05
155	Bluebush shrubland on stony rises and downs in the arid and semi-arid zones	Disturbed	0	0.87	0.87
155	Bluebush shrubland on stony rises and downs in the arid and semi-arid zones	Good	22.40	7.77	30.17
158	Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)	Good	0	0.38	0.38
Nil	Cleared		0.63	0.72	1.35
	Planted Street Trees		0	0.17	0.17
Total Vegetation			**31.68**	**15.93**	**47.61**



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- Cleared

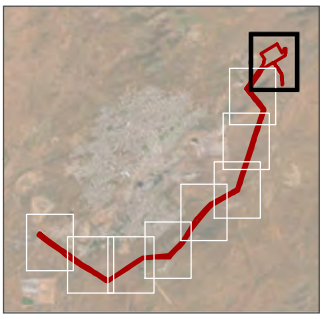


FIGURE 4.2A

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
- Cleared

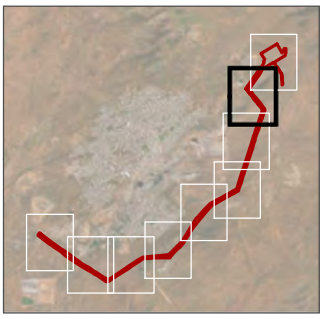
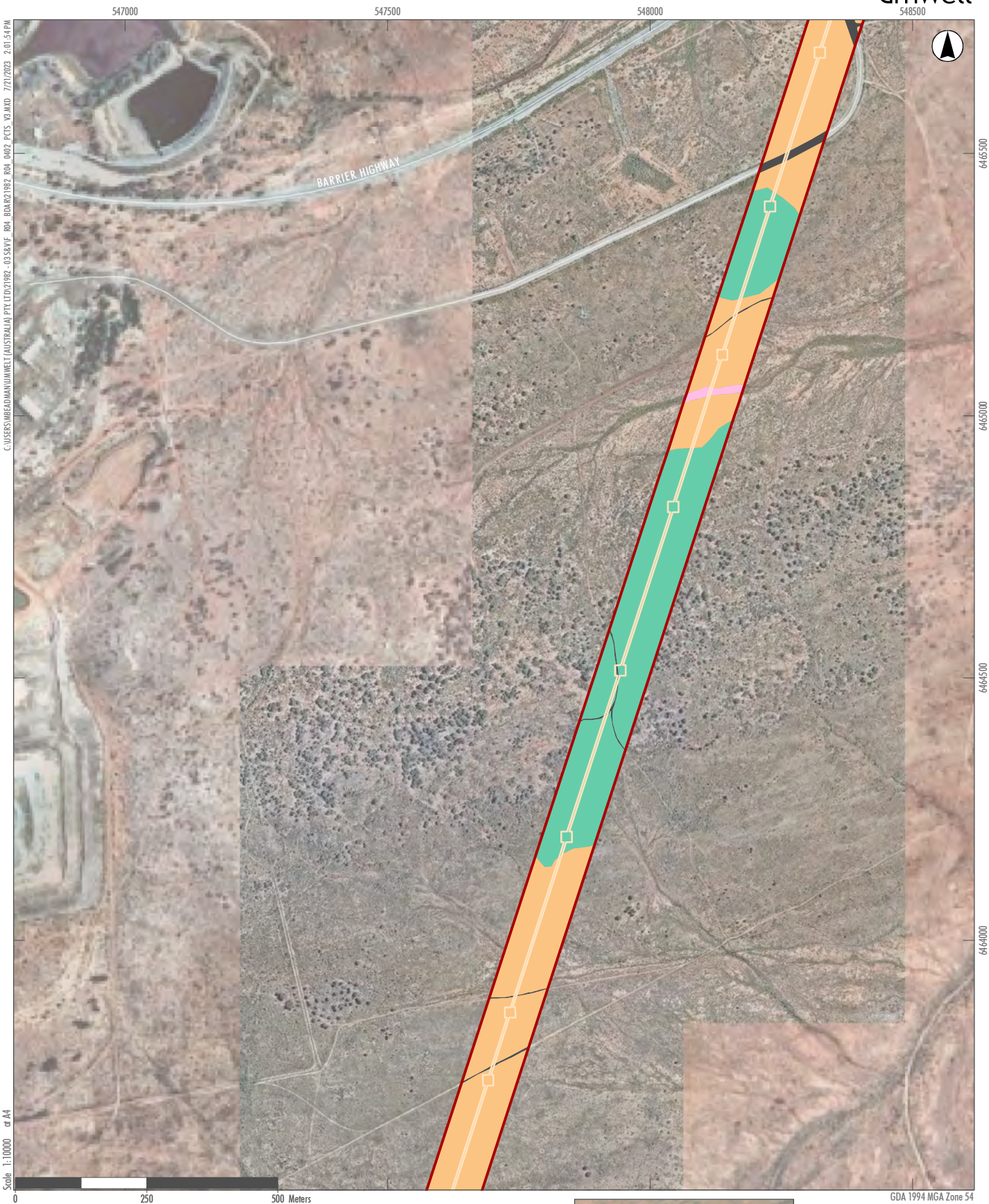


FIGURE 4.2B

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- Cleared

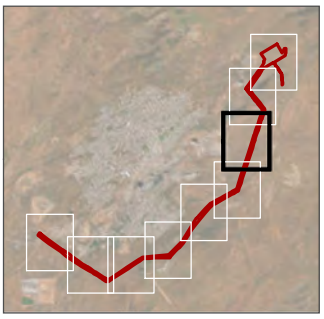


FIGURE 4.2C

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
- 150 - Bottlewasher - Copperburr grassland of the arid zone
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- Cleared

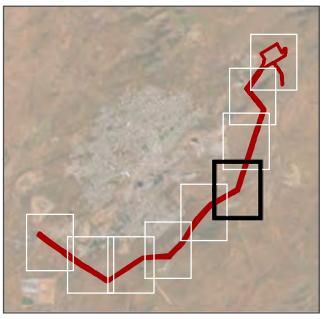


FIGURE 4.2D

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 150 - Bottlewasher - Copperburr grassland of the arid zone
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- Cleared

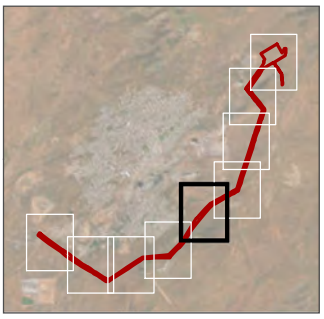
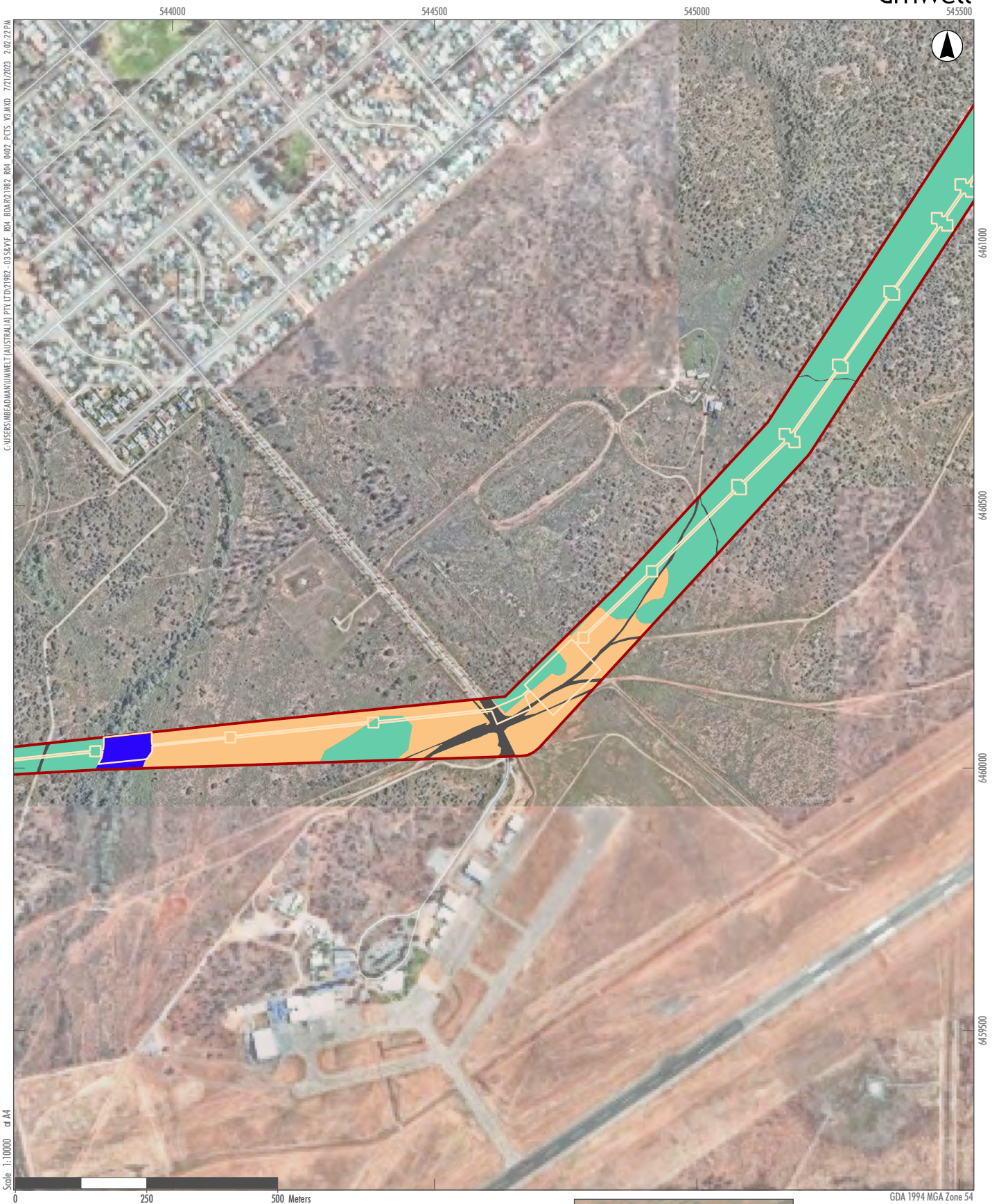


FIGURE 4.2E

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- Cleared

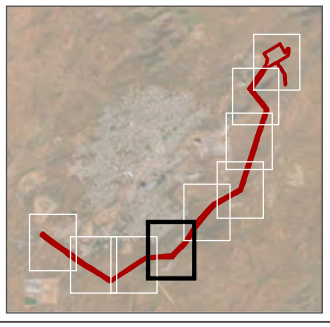


FIGURE 4.2F

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- Cleared

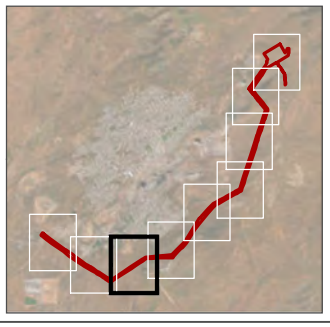
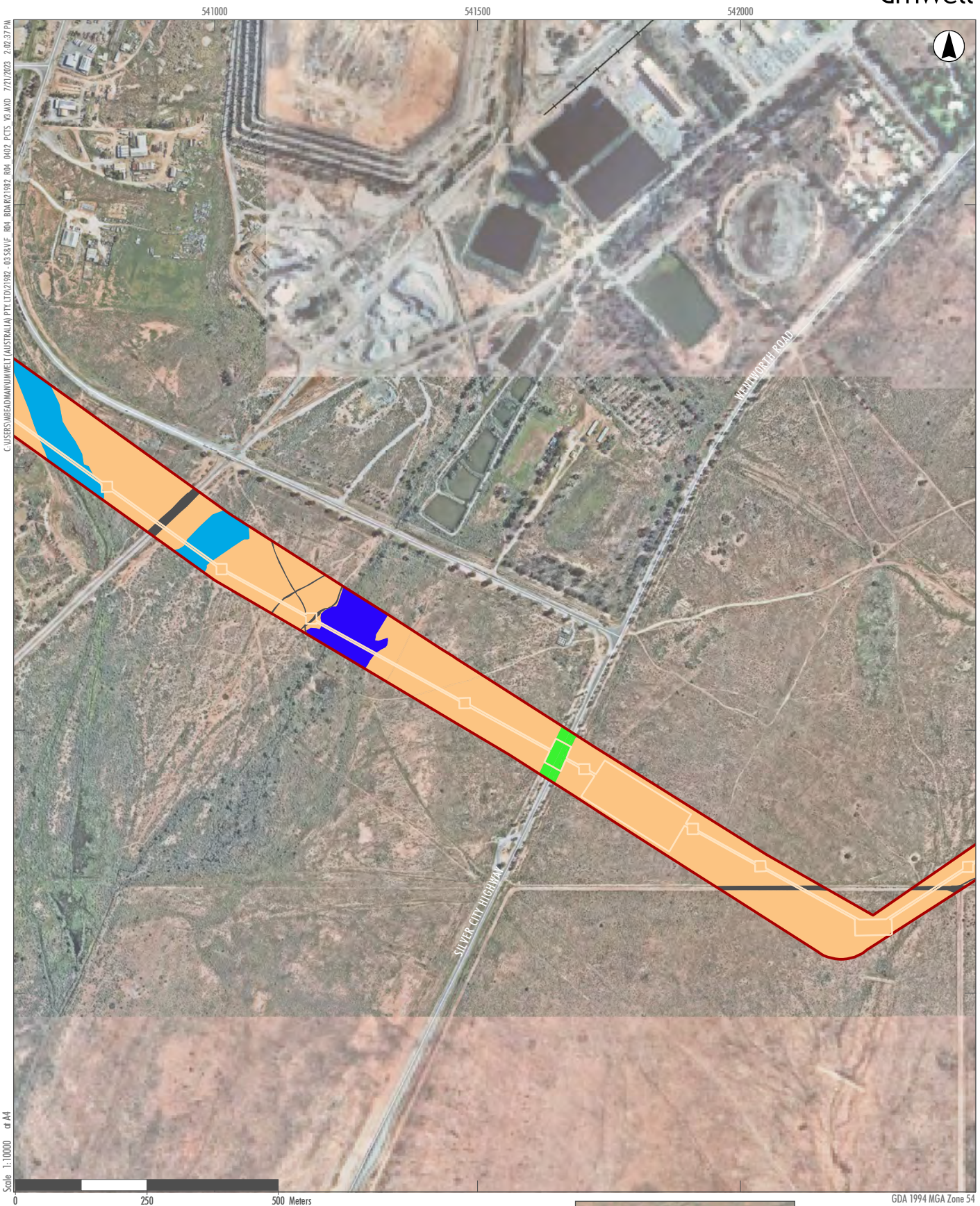


FIGURE 4.2G

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name)

- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
- Cleared
- Planted Street Trees

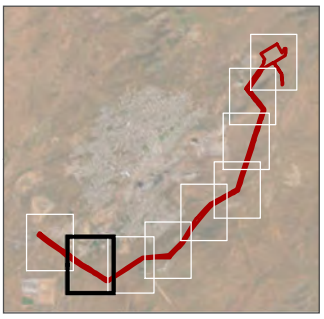


FIGURE 4.2H

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Transgrid Substation

Plant Community Type (PCT ID - Name)

- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
- Cleared

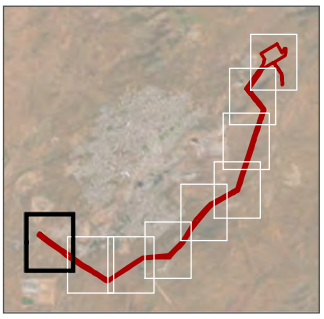


FIGURE 4.2I

Plant Community Types

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

4.2.2 Detailed Descriptions of Justification of Plant Community Types Present

4.2.2.1 PCT 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone

Table 4.2 details the vegetation formation, class, per cent cleared and extent for PCT 41 within the Subject Land.

Table 4.2 PCT41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone

PCTID	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
PCT name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
Vegetation formation	Semi-arid Woodlands (Grassy sub-formation)
Vegetation class	North-west Floodplain Woodlands
Per cent cleared value (%)	13.00
Extent within Disturbance Area (ha)- SCES Facility	0
Extent within Disturbance Area (ha) – Transmission Line	0.62
Total within combined (ha) Disturbance Area	0.62

PCT 41 occurs in the following vegetation zones within the Project Area as detailed in **Table 4.3**, **Table 4.4** and **Table 4.5**.

Table 4.3 PCT 41 - Derived Shrubland

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
BAM C PCT Number	PCT 41
Vegetation Condition Zone	1 – PCT 41 Derived Shrubland
Extent within Subject Land (ha)- SCES Facility	0
Extent within Subject Land (ha) - Transmission Line	0.05
Plots Completed	1 Plot (P_21982_021)
Formation	Semi-arid Woodlands (Grassy sub-formation)
Class	North-west Floodplain Woodlands

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
Photo	
Location	This vegetation zone occurs in the southwest of the Transmission Line component of the Subject Land in an area of lower lying topography associated with an unnamed drainage line.
Canopy Description	The upper stratum is comprised of scattered *Acacia salicina*.
Shrub Description	Common shrubs include *Maireana pyramidata*, *Rhagodia spinescens*, *Atriplex nummularia* and *Senna artemisioides* <--> *zygophylla*, with occurrences of *Enchylaena tomentosa* and *Sclerolaena diacantha.*
Ground Cover Description	The groundcover is dominated by grasses and chenopods, including, *Austrostipa nitida*, *Sida fibulifera*, and *Enneapogon avenaceus*. Other species include, *Solanum esuriale* and *Aristida personata*.
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include, *Carrichtera annua, Medicago minima, Vicia monantha, Sonchus oleraceus* and *Malvastrum americanum*.
PCT Allocation Justification	**Location/Landscape Position**: Within the Project Area this vegetation zone occurs on a sandy creek line on the lower slopes on the Barrier Range region. PCT 41 is described in the VIS as occurring in sandy creeks on sandplains of lower slopes of rises or hills in the arid climate zone of far north-western NSW in the Broken Hill Complex, Simpson-Strzlecki Dunefields, western Mulga Lands and Channel Country Bioregions, occurring in sandy creeks on sandplains of the lower slopes of rises or hills. This description corresponds with the area assigned to this PCT. **Community structure**: PCT 41 is described in the VIS as an open woodland or a tall open woodland to 15 m high with a sparse shrub layer and ground stratum comprised of chenopods and native grasses. The vegetation zone exists in a disturbed state and may not reflect characteristics described in the VIS; however PCT identification was based on landscape position, species assemblage and similarities with Vegetation Zone 2 (which exists in a more intact state). **Species assemblage**: This vegetation zone supports 13 characteristic species for PCT 41, as identified by the VIS classification. These characteristic species have been identified above. Additionally, a single

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
	Eucalyptus camaldulensis was recorded upstream of this vegetation zone close to the Project Area. **Other PCTs considered**: PCT 128 was identified by the VIS classification as a potential PCT match for this Vegetation Zone. It was discounted as a potential match due to species assemblage and landscape position. Vegetation Zone 1 had 10 characteristic species matches to PCT 128 VIS profile. The VIS describes PCT 128 as occurring on flats or undulating sandplains of far central and southwestern NSW in the semi-arid zone. PCT 136 was identified by the VIS classification as a potential PCT match for this Vegetation Zone. It was discounted as a potential match due to species assemblage and landscape position. Vegetation Zone 1 had 9 characteristic species matches to PCT 136 VIS profile. The VIS describes PCT 136 as occurring on the Barrier Range near Broken Hill and on rolling stony downs in other places in far north-western NSW.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

Table 4.4 PCT 41 - High Weed Cover

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
BAM C PCT Number	PCT 41
Vegetation Condition Zone	2 – PCT 41 High Weed Cover
Extent within Subject Land (ha) - SCES Facility	0
Extent within Subject Land (ha) - Transmission Line	0.47
Plots Completed	1 Plot (P_21982_019)
Formation	Semi-arid Woodlands (Grassy sub-formation)
Class	North-west Floodplain Woodlands
Photo	
Location	This vegetation zone occurs along the Transmission Line component of the Subject Land along an area of lower lying topography associated with an unnamed drainage line.
Canopy Description	The canopy is dominated by *Eucalyptus camaldulensis.*
Shrub Description	Common shrubs include *Senna artemisioides <--> zygophylla, Rhagodia spinescens, Myoporum montanum* and *Acacia victoriae* with occurrences of *Acacia aneura* and *Atriplex nummularia.*
Ground Cover Description	The groundcover is comprised of *Euphorbia peplus, Verbena africana, Cynodon dactylon* and *Convolvulus remotus.*

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include *Conyza bonariensis*, *Fumaria capreolata, Solanum nigrum, Dimorphotheca ecklonis,* and *Rumex crispus.*
PCT Allocation Justification	**Location/Landscape Position**: PCT 41 is described in the VIS Classification as occurring in sandy creeks on sandplains of lower slopes of rises or hills in the arid climate zone of far northwestern NSW in the Broken Hill Complex, Simpson-Strzlecki Dunefields, western Mulga Lands and Channel Country Bioregions. Occurs in sandy creeks on sandplains of the lower slopes of rises or hills. **Community structure**: PCT 41 is described in the VIS as an open woodland or a tall open woodland to 15 m high with a sparse shrub layer and ground stratum comprised of chenopods and native grasses. Vegetation Zone 2, though in a disturbed state, aligns with this description. **Species assemblage**: The dominant species per stratum are identified above. Out of the 13 native species recorded in the vegetation zone, 6 are characteristic for PCT 41. Characteristic species include *Senna artemisioides <--> zygophylla, Rhagodia spinescens, Myoporum montanum, Acacia victoriae, Eucalyptus camaldulensis* and *Acacia salicina*. **Other PCTs considered**: PCT 10 and PCT 36 were identified by the VIS as potential PCT matches for this Vegetation Zone, however, both were discounted as they did not occur within the IBRA subregion. PCT 136 was also identified by the VIS as a potential PCT match for this Vegetation Zone, however, it was discounted due to the absence of *Eucalyptus camaldulensis* in the PCT profile.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

Table 4.5 PCT 41 - Planted

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
BAM C PCT Number	PCT 41
Vegetation Condition Zone	3 – PCT 41 Planted
Extent within Subject Land (ha) - SCES Facility	0
Extent within Subject Land (ha) - Transmission Line	0.11
Plots Completed	1 Plot (P_21982_006)
Formation	Semi-arid Woodlands (Grassy sub-formation)
Class	North-west Floodplain Woodlands

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
Photo	
Location	This vegetation zone occurs in the northeast of the transmission line component of the Project Area in an area of lower lying topography associated with an unnamed drainage line.
Canopy Description	The canopy is comprised of planted *Eucalyptus camaldulensis*.
Shrub Description	Common shrubs include *Acacia victoriae, Atriplex vesicaria* and *Rhagodia spinescens* with occurrences of *Atriplex nummularia* and *Myoporum montanum*.
Ground Cover Description	The ground cover is comprised of grasses and chenopods, including, *Chrysocephalum apiculatum, Austrostipa nitida, Cyperus gymnocaulos* and *Aristida personata*.
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include, *Limonium lobatum, Medicago* sp., *Asphodelus fistulosus, Sonchus oleraceus* and *Vicia monantha*.
PCT Allocation Justification	**Location/Landscape Position**: PCT 41 is described in the VIS as occurring in sandy creeks on sandplains of lower slopes of rises or hills in the arid climate zone of far northwestern NSW in the Broken Hill Complex, Simpson-Strzlecki Dunefields, western Mulga Lands and Channel Country Bioregions, occurring in sandy creeks on sandplains of the lower slopes of rises or hills. **Community structure**: PCT 41 is described in the VIS as an open woodland or a tall open woodland to 15 m high with a sparse shrub layer and ground stratum comprised of chenopods and native grasses. The vegetation zone exists in a disturbed state and may not reflect characteristics described in the VIS classification, however PCT identification was based on landscape position, species assemblage and similarities with Vegetation Zone 2 (which exists in a more intact state). **Species assemblage**: This vegetation zone supports 4 characteristic species for PCT 41, as identified by the VIS. Characteristic species include *Eucalyptus camaldulensis, Acacia victoriae, Atriplex vesicaria* and *Rhagodia spinescens*.

PCT Name	River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone
	Other PCTs considered: PCT 36, PCT 37, PCT 66 and PCT 51 were identified by the VIS classification as potential PCT matches for this vegetation zone. All PCT's were discounted as they did not occur within the IBRA subregion of the Project Area. PCT 123, PCT 139, PCT 143, PCT 155, PCT 207 and PCT 215 were identified by the VIS as potential PCT matches for this Vegetation Zone. They were discounted as they all lacked *Eucalyptus camaldulensis* in the canopy and had fewer floristic similarities than PCT 41. PCT 59 was identified by the VIS as a potential a PCT match for this Vegetation Zone, however, it was discounted due to the absence of *Eucalyptus camaldulensis* in the PCT profile.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

4.2.2.2 PCT 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion

Table 4.6 details the vegetation formation, class, per cent cleared and extent for PCT 123 within the Subject Land.

Table 4.6 PCT 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion

PCTID	123
PCT name	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
Vegetation formation	Arid Shrublands (Acacia sub-formation)
Vegetation class	Stony Desert Mulga Shrublands
Per cent cleared value (%)	17.00
Extent within Subject Land (ha) – SCES Facility	5.21
Extent within Subject Land (ha) – Transmission Line	4.14
Total within combined (ha) Disturbance Area	9.35

PCT 123 occurs in the following vegetation zones within the Project Area as detailed in **Table 4.7** and **Table 4.8**.

Table 4.7 PCT 123 - Dieback

PCT Name	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
BAM C PCT Number	PCT 123
Vegetation Condition Zone	4 – PCT 123 Dieback
Extent within Subject Land (ha) – SCES Facility	0
Extent within Subject Land (ha) – Transmission Line	0.22
Plots Completed	1 Plot (P_21982_011)
Formation	Arid Shrublands (Acacia sub-formation)
Class	Stony Desert Mulga Shrublands

PCT Name	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
Photo	
Location	This vegetation zone occurs in the along the transmission line component of the Subject Land, on a low stoney rise.
Canopy Description	The canopy is dominated by *Acacia aneura.*
Shrub Description	Common shrubs include *Acacia aneura, Acacia tetragonophylla, Enchylaena tomentosa, Senna artemisioides <--> zygophylla* and *Solanum sturtianum* with occurrences of *Sclerolaena obliquicuspis* and *Maireana decalvans*.
Ground Cover Description	The ground cover is dominated by *Austrostipa nitida* with occurrences from *Enneapogon intermedius, Zygophyllum iodocarpum* and *Brachyscome ciliaris*.
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include A*sphodelus fistulosus* and *Carrichtera annua*.
PCT Allocation Justification	**Location/Landscape Position**: PCT 123 is described in the VIS as occurring on skeletal or shallow, stony, red earth soils on crests and steep slopes and terraced lats on stony hills and outcrops in far northwestern NSW from Milparinka in the north to its main occurrence on the Barrier Range and near Mutawintji in the south. It also occurs on the Peery Range and towards Tilpa in the east and extends to westwards to the Olary Sur and eastern Flinders Ranges in South Australia. Occurs on low hills. **Community structure**: PCT 123 is described in the VIS classification as a tall open shrubland, dominated by Mulga (*Acacia aneura*) and Dead Finish (*Acacia tetragonophylla*), with a typically sparse understorey, dominated by a range of *Acacia* spp. and *Eremophila* spp., and the ground layer variable depending on the soil condition, dominated by a range of native grasses and chenopods.

PCT Name	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
	Species assemblage: This vegetation zone supports 6 characteristic species for PCT 123, as identified by the VIS classification. Characteristic species include *Acacia aneura, Acacia tetragonophylla, Enchylaena tomentosa, Senna artemisioides <--> zygophylla, Solanum sturtianum* and *Austrostipa nitida.* Identification of this vegetation zone was also based on similarities with vegetation zone 5 (PCT 123 Good) which exists in a more intact state than this vegetation zone. **Other PCTs considered**: PCT 59 and PCT 69 were considered using the VIS classification, however, they were discounted due to having fewer floristic similarities than PCT 123.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

Table 4.8 PCT123 - Good

PCT Name	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
BAM C PCT Number	PCT 123
Vegetation Condition Zone	5 – Good
Extent within Subject Land (ha) – SCES Facility	5.21
Plots Completed SCES Facility	3 Plots (P_21982_031, P_21982_032, P_21982_033)
Extent within Subject Land (ha) – Transmission Line	3.92
Plots Completed Transmission Line	5 Plots (P_21982_004, P_21982_008, P_21982_016, P_21982_017, P_21982_018)
Formation	Arid Shrublands (Acacia sub-formation)
Class	Stony Desert Mulga Shrublands

PCT Name	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
Photo	
Location	This vegetation zone occurs on stoney rises and is present across much of the Project Area.
Canopy Description	The canopy is dominated by *Acacia aneura.*
Shrub Description	Common shrubs include *Acacia tetragonophylla, Senna artemisioides* subsp. X *artemisioides, Prostanthera striatiflora, Maireana triptera, Acacia brachystachya, Enchylaena tomentosa, Ptilotus obovatus, Sida petrophila, Abutilon fraseri, Acacia victoriae, Dodonaea lobulata* and.
Ground Cover Description	The ground cover is comprised of *Austrostipa nitida, Aristida contorta, Cheilanthes sieberi* subsp. *sieberi, Calotis hispidula, Cheilanthes lasiophylla, Digitaria brownii, Einadia nutans* subsp. *nutans* and *Zygophyllum iodocarpum*.
Introduced Species	Exotic cover is present in this vegetation zone but not dominant. Exotic species include *Carrichtera annua, Echium plantagineum* and *Sonchus oleraceus*.
PCT Allocation Justification	**Location/Landscape Position**: PCT 123 is described in the VIS classification as occurring on skeletal or shallow, stony, red earth soils on crests and steep slopes, stony hills and outcrops in far north western NSW from Milparinka in the north to its main occurrence on the Barrier Range and near Mutawintji in the south. It also occurs on the Peery Range and towards Tilpa in the east and extends to westwards to the Olary Sur and eastern Flinders Ranges in South Australia. Occurs on low hills. This vegetation zone complies with this description. **Community structure**: PCT 123 is described in the VIS as a tall open shrubland, dominated by Mulga (*Acacia aneura*) and Dead Finish (*Acacia tetragonophylla*), with the understorey is usually sparse, dominated by a range of *Acacia* spp. and *Eremophila* spp., and the ground layer variable depending on the soil condition, dominated by a range of native grasses and chenopods. **Species assemblage**: The out of the 61 native species recorded in this vegetation zone, 21 are characteristic species for PCT 123, as identified by the VIS classification. Characteristic species include *Acacia aneura, Acacia tetragonophylla, Senna artemisioides* subsp. X *artemisioides, Prostanthera striatiflora, Maireana triptera, Acacia brachystachya, Enchylaena tomentosa,*

PCT Name	Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
	Ptilotus obovatus, Sida petrophila, Abutilon fraseri, Acacia victoriae, Dodonaea lobulata, Solanum sturtianum, Austrostipa nitida, Aristida contorta, Cheilanthes sieberi subsp. *sieberi, Calotis hispidula, Cheilanthes lasiophylla, Digitaria brownii, Einadia nutans* subsp. *nutans* and *Zygophyllum iodocarpum*. **Other PCTs considered**: PCT 59, PCT 156 and PCT 220 were considered in the VIS classification. They were discounted as they had fewer floristic similarities compared to PCT 123.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

4.2.2.3 PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone

Table 4.9 details the vegetation formation, class, per cent cleared and extent for PCT 136 within the Subject Land.

Table 4.9 PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone

PCTID	136
PCT name	Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
Vegetation formation	Arid Shrublands (Chenopod sub-formation)
Vegetation class	Gibber Chenopod Shrublands
Per cent cleared value (%)	20
Extent within Subject Land (ha) – SCES Facility	3.45
Extent within Subject Land (ha) – Transmission Line	0.20
Total within combined (ha) Disturbance Area	3.65

PCT 136 occurs in the following Vegetation Zones within the Project Area as detailed in **Table 4.10** and **Table 4.11**.

Table 4.10 PCT136 - Disturbed

PCT Name	PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
BAM C PCT Number	PCT 136
Vegetation Condition Zone	6 – PCT 136 Disturbed– High Weed Cover
Extent within Subject Land (ha) – SCES Facility	0
Extent within Subject Land (ha) – Transmission Line	0.11
Plots Completed Transmission Line	2 Plots (P_21982_023, P_21982_024)
Formation	Arid Shrublands (Chenopod sub-formation)
Class	Gibber Chenopod Shrublands

PCT Name	PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
Photo	
Location	This vegetation zone occurs on sandy creek lines and is associated with a drainage line in the southern portion of the Transmission Line.
Canopy Description	The canopy is dominated by *Acacia victoriae*.
Shrub Description	Common shrubs include *Maireana pyramidata*, *Atriplex nummularia*, *Rhagodia spinescens*, *Acacia victoriae*, *Sclerolaena tricuspis* and *Myoporum montanum*.
Ground Cover Description	The ground cover is comprised of *Cynodon dactylon* and *Leiocarpa tomentosa* with occurrences of *Austrostipa nodosa* and *Senecio quadridentatus.*
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include, *Asphodelus fistulosus, Carrichtera annua, Echium plantagineum* and *Galenia pubescens*.
PCT Allocation Justification	**Location/Landscape Position**: PCT 136 is described in the VIS classification as occurring on stony, loam-clayey soil derived from sedimentary or metamorphic rocks along drainage lines on rises or low hills on the Barrier Range near Broken Hill and on rolling stony downs in other places in far north-western NSW extending into south Australia. Occurs on low hills and rises. This vegetation zone is consistent with this description. **Community structure**: The VIS classification describes PCT 136 as a shrubland dominated by Prickly Wattle (*Acacia victoriae*), with an understory of chenopods including Black Bluebush (*Maireana pyramidata*), *Maireana brevifolia*, Thorny Saltbush (*Rhagodia spinescens*) and Bladder Saltbush (*Atriplex vesicaria*) occurring along drainage lines. The structure of this vegetation zone aligns with that of the VIS classification description of PCT 136. **Species assemblage**: Of the 25 species recorded in this vegetation zone, 7 are characteristic species for PCT 136, as identified by the VIS classification. Characteristic species include *Acacia oswaldii, Atriplex nummularia, Rhagodia spinescens, Acacia victoriae, Sclerolaena tricuspis, Myoporum montanum, Cynodon dactylon* and *Leiocarpa tomentosa*.. Identification of this vegetation

PCT Name	PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
	zone was also based on similarities with vegetation zone 7 (PCT 136 Good) which exists in a more intact state than this vegetation zone. **Other PCTs considered**: PCT 143 was considered in the VIS classification, however, it was discounted as the description does not specify creek lines. PCT 143 was also discounted as it generally occurs on sandplains and low sandy rises of dune fields in semi-arid and arid zones which does not fit the vegetation zone. PCT 153 was also considered in the VIS classification. It was discounted due to an absence of Prickly Wattle (*Acacia victoriae*) in the VIS classification PCT description.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

Table 4.11 PCT136 - Good

PCT Name	PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
BAM C PCT Number	PCT 136
Vegetation Condition Zone	7 – Good
Extent within Subject Land (ha) – SCES Facility	3.45
Plots Completed SCES Facility	3 Plots (P_21982_003, P_21982_029, P_21982_030)
Extent within Subject Land (ha) – Transmission Line	0.09
Plots Completed Transmission Line	1 Plot (P_21982_010)
Formation	Arid Shrublands (Chenopod sub-formation)
Class	Gibber Chenopod Shrublands

PCT Name	PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
Photo	
Location	This vegetation zone occurs on sandy creek lines and is present across much of the Project Area.
Canopy Description	The canopy is dominated by *Acacia victoriae*.
Shrub Description	Common shrubs include *Maireana pyramidata, Sclerolaena diacantha, Ptilotus obovatus, Rhagodia spinescens, Dissocarpus paradoxus, Sclerolaena obliquicuspis* and *Maireana brevifolia*.
Ground Cover Description	The ground cover is comprised of *Sida fibulifera, Cymbopogon ambiguus* and *Enneapogon avenaceus* with occurrences of *Austrostipa nitida, Aristida personata* and *Enneapogon intermedius*.
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include, *Sisymbrium irio, Carrichtera annua, Medicago* sp.*, Asphodelus fistulosus* and *Echium plantagineum*.
PCT Allocation Justification	**Location/Landscape Position**: PCT 136 is described in the VIS classification as occurring on stony, loam-clayey soil derived from sedimentary or metamorphic rocks along drainage lines on rises or low hills on the Barrier Range near Broken Hill and on rolling stony downs in other places in far north-western NSW extending into south Australia. PCT 136 occurs on low hills and rises. This vegetation zone complies with this description. **Community structure:** The VIS classification describes PCT 136 as a shrubland dominated by Prickly Wattle (*Acacia victoriae*), with an understory of chenopods including Black Bluebush (*Maireana pyramidata*), *Maireana brevifolia*, Thorny Saltbush (*Rhagodia spinescens*) and Bladder Saltbush (*Atriplex vesicaria*) occurring along drainage lines. The structure of this vegetation zone aligns with that of the VIS classification description of PCT 136. **Species assemblage:** Out of the 48 native species recorded in this vegetation zone, 11 are characteristic species for PCT 136, as identified by the VIS classification. These characteristic species include *Maireana pyramidata, Sclerolaena diacantha, Acacia victoriae, Ptilotus obovatus, Rhagodia spinescens,*

PCT Name	PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone
	Dissocarpus paradoxus, Sclerolaena obliquicuspis, Maireana brevifolia, Sida fibulifera, Cymbopogon ambiguus and *Enneapogon avenaceus.* **Other PCTs considered**: PCT 59 was considered in the VIS classification, however it was discounted as it does not occur on creek lines. It occurs on level to undulating sandplains and sandy rises, whereas this vegetation zone occurs in low lying area along creek lines. PCT 128 was considered in the VIS classification, however it was discounted as it does not occur on creek lines. It occurs on flat or undulating sandplains in central and southwestern NSW. PCT 139 was considered in the VIS classification, however it was discounted as it had fewer floristic similarities to PCT 136. PCT 143 was also considered in the VIS classification, however it was discounted as it does not occur on creek lines, as it occurs on sandplains and low sandy rises of dune fields.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

4.2.2.4 PCT150 Bottlewasher - Copperburr grassland of the arid zone

Table 4.12 details the vegetation formation, class, per cent cleared and extent for PCT 150 within the Subject Land.

Table 4.12 PCT150 Bottlewasher - Copperburr grassland of the arid zone

PCTID	150
PCT name	Bottlewasher - Copperburr grassland of the arid zone
Vegetation formation	Arid Shrublands (Chenopod sub-formation)
Vegetation class	Gibber Chenopod Shrublands
Per cent cleared value (%)	5.00
Extent within Subject Land (ha) – SCES Facility	0
Extent within Subject Land (ha) – Transmission Line	1.05
Total within combined (ha) Disturbance Area	1.05

PCT 150 occurs as a single condition type, as detailed in **Table 4.13**.

Table 4.13 PCT150 - Good

PCT Name	PCT150 Bottlewasher - Copperburr grassland of the arid zone
BAM C PCT Number	PCT 150
Vegetation Condition Zone	8 – Good
Extent within Subject Land (ha) – SCES Facility	0
Extent within Subject Land (ha) – Transmission Line	1.05
Plots Completed	2 Plots (P_21982_012, P_21982_013)
Formation	Arid Shrublands (Chenopod sub-formation)
Class	Gibber Chenopod Shrublands

PCT Name	PCT150 Bottlewasher - Copperburr grassland of the arid zone
Photo	
Location	This vegetation zone occurs in the centre of the transmission line component of the Subject Land.
Canopy Description	No canopy present in this vegetation zone.
Shrub Description	common shrubs include *Maireana pyramidata, Maireana triptera, Acacia tetragonophylla, Enchylaena tomentosa, Salsola australis* and *Abutilon halophilum*.
Ground Cover Description	The ground cover is comprised of *Swainsona fissimontana, Einadia nutans* subsp. *nutans* and *Solanum esuriale* with occurrences of *Enneapogon avenaceus, Enneapogon intermedius, Austrostipa nitida* and *Zygophyllum iodocarpum*.
Introduced Species	Exotic cover is present in this vegetation zone but not dominant. Exotic species include, *Carrichtera annua, Asphodelus fistulosus, Medicago* sp. and *Sonchus oleraceus*.
PCT Allocation Justification	**Location/Landscape Position:** PCT 150 is described in the VIS classification as occurring on moderately saline, deep, calcareous sandy brown, loam soils with quartz gravel sometimes present on the surface. The soils are often derived from limestone or calcareous sedimentary rocks. Restricted to undulating downs or stony flats in the arid zone. Occurs on low hills and rises. This vegetation zone generally consistent with this description. **Community structure**: PCT 150 is described by the VIS classification as a low tussock open grassland dominated by a number of bottle washer grasses and copperburr species with scattered shrubs. This vegetation zone aligns with the VIS classification description of PCT 150. **Species assemblage**: This vegetation zone supports 9 characteristic species for PCT 150, as identified by the VIS classification. Characteristic species include *Maireana pyramidata, Maireana triptera, Acacia tetragonophylla, Enchylaena tomentosa, Salsola australis, Abutilon halophilum, Swainsona fissimontana, Einadia nutans* subsp. *nutans* and *Solanum esuriale.*

PCT Name	PCT150 Bottlewasher - Copperburr grassland of the arid zone
	Other PCTs considered: PCT 153 and PCT 156 were both considered in the VIS classification. They were discounted as they had fewer floristic similarities than PCT 150.
BC Act Status	This PCT does not correspond with any BC Act listed ecological communities.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

4.2.2.5 PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones

Table 4.14 details the vegetation formation, class, per cent cleared and extent for PCT 155 within the Subject Land.

Table 4.14 PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones

PCTID	PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
PCT name	Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
Vegetation formation	Arid Shrublands (Chenopod sub-formation)
Vegetation class	Gibber Chenopod Shrublands
Per cent cleared value (%)	50.00
Extent within Subject Land (ha) – SCES Facility	22.40
Extent within Subject Land (ha) – Transmission Line	8.65
Total within combined (ha) Disturbance Area	31.04

PCT 155 occurs in the following Vegetation Zones within the Project Area as detailed in **Table 4.15** and **Table 4.16**.

Table 4.15 PCT155 - Disturbed

PCT Name	PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
BAM C PC Number	PCT 155
Vegetation Condition Zone	9 – PCT 155 Disturbed
Extent within Subject Land (ha) – SCES Facility	0
Extent within Subject Land (ha) – Transmission Line	0.90
Plots Completed	2 Plots (P_21982_014, P_21982_015)
Formation	Arid Shrublands (Chenopod sub-formation)
Class	Gibber Chenopod Shrublands

PCT Name	PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
Photo	
Location	This vegetation zone occurs on stoney rises and flats and is present across much of the Project Area.
Canopy Description	A canopy layer is absent from this vegetation zone.
Shrub Description	Common shrubs include *Acacia victoriae, Sclerolaena tricuspis, Sclerolaena obliquicuspis, Maireana pyramidata, Abutilon halophilum, Sida intricata, Senna artemisioides* subsp. X *artemisioides, Senna artemisioides, Atriplex stipitata* and *Rhagodia spinescens*.
Ground Cover Description	The ground cover is comprised of *Austrostipa nitida* and *Erodium crinitum* with occurrences of *Zygophyllum iodocarpum* and *Atriplex holocarpa*.
Introduced Species	Given the previous disturbance of this vegetation zone, it has higher exotic plant cover. Exotic species include *Carrichtera annua, Medicago* sp., *Asphodelus fistulosus* and *Sisymbrium irio*.
PCT Allocation Justification	**Location/Landscape Position**: PCT 155 is described in the VIS classification as occurring on red or brown clays, calcareous red loams and skeletal soils derived from shales, ferruginous sandstone and other substrates, often containing gibbers on undulating gibber plains, stony rises, adjoining slopes and associated drainage lines. Distributed in the Barrier Ranges north of Broken Hill and the Noonthorangee Range west of White Cliffs in the arid zone of far north-western NSW and extending into South Australia. Occurs on low hills and rises. This vegetation zone is consistent with this description. **Community structure**: The VIS classification describes PCT 155 as a mid-high open shrubland dominated by bluebushes, mainly Black Bluebush (*Maireana pyramidata*). This vegetation zone aligns with the VIS classification description of PCT 155. **Species assemblage**: Out of the 47 species recorded in this vegetation zone, 17 are characteristic species for PCT 155, as identified by the VIS classification. Characteristic species include *Sclerolaena tricuspis, Sclerolaena obliquicuspis, Acacia victoriae, Maireana pyramidata, Abutilon halophilum, Sida intricata, Senna artemisioides* subsp. X *artemisioides, Senna artemisioides, Atriplex stipitata, Rhagodia spinescens, Austrostipa nitida* and *Erodium crinitum.*

PCT Name	PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
	Other PCTs considered: PCT 154 was considered in the VIS classification, however, it was discounted as it had fewer floristic similarities to PCT 155. PCT 143 was considered in the VIS, while this PCT had a high number of species matches for this vegetation zone it was discounted because the vegetation zone is not dominated by Narrow-leaved Hopbush (*Dodonaea viscosa subsp. angustissima*).
BC Act Status	*Acacia loderi* shrublands Endangered Ecological Community is 'in part' associated with PCT 155. During PCT mapping surveys ecologists searched this vegetation zone for *Acacia loderi.* No individuals were observed. Due to the absence of *Acacia loderi* it was determined that this ecological community does not occur within the Project Area.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

Table 4.16 PCT155 - Good

PCT Name	PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
BAM C PCT Number	PCT 155
Vegetation Condition Zone	10 – PCT 155 Good
Extent within Subject Land (ha) – SCES Facility	22.40
Plots completed SCES Facility	4 plots (P_21982_001, P_21982_002, P_21982_027, P_21982_028)
Extent within Subject Land (ha) – Transmission Line	7.77
Plots completed Transmission Line	5 plots (P_21982_007, P_21982_009, P_21982_020, P_21982_025, P_21982_026)
Formation	Arid Shrublands (Chenopod sub-formation)
Class	Gibber Chenopod Shrublands
Photo	
Location	This vegetation zone occurs on stoney rises and flats and is present across much of the Project Area.
Canopy Description	The canopy is sparse in with vegetation zone, however there are occurrences of Acacia victoriae.
Shrub Description	Common shrubs include *Sclerolaena tricuspis, Maireana pyramidata, Atriplex vesicaria, Sclerolaena obliquicuspis, Maireana sedifolia, Rhagodia spinescens, Sida intricata, Maireana sclerolaenoides, Acacia tetragonophylla, Atriplex stipitata* and *Enchylaena tomentosa*.
Ground Cover Description	The ground cover is comprised of *Austrostipa nitida, Brachyscome ciliaris, Calotis hispidula*. and *Sida corrugata,* and *Sida intricata*.
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include *Carrichtera annua, Medicago* sp.*, Asphodelus fistulosus* and *Sisymbrium irio*.

PCT Name	PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
PCT Allocation Justification	**Location/Landscape Position**: PCT 155 is described in the VIS classification as occurring on red or brown clays, calcareous red loams and skeletal soils derived from shales, ferruginous sandstone and other substrates, often containing gibbers on undulating gibber plains, stony rises, adjoining slopes and associated drainage lines. Distributed in the Barrier Ranges north of Broken Hill and the Noonthorangee Range west of White Cliffs in the arid zone of far north-western NSW and extending into South Australia. Occurs on low hills and rises. This vegetation zone is consistent with this description. **Community structure**: The VIS classification describes PCT 155 as a mid-high open shrubland dominated by bluebushes mainly Black Bluebush (*Maireana pyramidata*). This vegetation zone aligns with the VIS classification description of PCT 155. **Species assemblage**: Out of the 78 species recorded in this vegetation zone, 17 are characteristic species for PCT 155, as identified by the VIS classification. Characteristic species include *Sclerolaena tricuspis, Maireana pyramidata, Atriplex vesicaria, Sclerolaena obliquicuspis, Maireana sedifolia, Rhagodia spinescens, Acacia victoriae, Sida intricata, Maireana sclerolaenoides, Acacia tetragonophylla, Atriplex stipitata, Enchylaena tomentosa, Austrostipa nitida, Brachyscome ciliaris, Calotis hispidul*a, *Sida corrugata* and *Sida intricata*. **Other PCTs considered**: PCT 154 was considered in the VIS classification, however it was discounted as it had fewer floristic similarities than PCT 155. PCT 169 was also considered in the VIS classification. It was discounted as this PCT has mallee eucalypts in its description, across the vegetation zone no mallees were observed.
BC Act Status	*Acacia loderi* shrublands Endangered Ecological Community is 'in part' associated with PCT 155. During PCT mapping surveys ecologists searched this vegetation zone for *Acacia loderi*. No individuals were observed. Due to the absence of *Acacia loderi* it was determined that this ecological community does not occur within the Project Area.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

4.2.2.6 PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)

Table 4.17 details the vegetation formation, class, per cent cleared and extent for PCT 158 within the Subject Land.

Table 4.17 PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)

PCTID	PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
PCT name	Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
Vegetation formation	Arid Shrublands (Chenopod sub-formation)
Vegetation class	Riverine Chenopod Shrublands
Per cent cleared value (%)	88.00
Extent within Subject Land (ha) – SCES Facility	0
Extent within Subject Land (ha) – Transmission Line	0.38
Total within combined (ha) Disturbance Area	0.38

PCT 158 occurs as a single condition type, as detailed in **Table 4.18**.

Table 4.18 PCT158 - Good

PCT Name	PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
BAM C PCT Number	PCT 158
Vegetation Condition Zone	11 – Good
Extent within Subject Land (ha) – SCES Facility	0
Extent within Subject Land (ha) – Transmission Line	0.38
Plots Completed Transmission Line	2 Plots (P_21982_005, P_21982_022).
Formation	Arid Shrublands (Chenopod sub-formation)
Class	Riverine Chenopod Shrublands

PCT Name	PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
Photo	
Location	This vegetation zone occurs on low lying flats and unnamed drainage lines within the Project Area.
Canopy Description	No canopy species present in this vegetation zone.
Shrub Description	Common shrubs include *Atriplex nummularia, Sclerolaena obliquicuspis, Dissocarpus paradoxus* and *Rhagodia spinescens*.
Ground Cover Description	The ground cover is comprised of *Daucus glochidiatus, Sida intricata and Rhodanthe moschata with occurrences of Austrostipa nitida, Convolvulus remotus* and *Tetragonia moorei*.
Introduced Species	Exotic cover is present in this vegetation zone. Exotic species include *Medicago polymorpha, Carrichtera annua, Lotus australis, Sisymbrium erysimoides* and *Sisymbrium irio*.
PCT Allocation Justification	**Location/Landscape Position**: PCT 158 is described in the VIS classification as occurring in restricted patches on grey clay or texture contrast sandy clay soils on periodically inundated alluvial plains and rises on or adjacent to floodplains in the upper Darling, Paroo and Bulloo Rivers and other rivers in northwestern NSW. Also occurs on heavy clays on the beds of pans between dunes in dunefield country along with Canegrass (*Eragrostis australasica*) - for example in the Bulloo Overflow. Occurs on alluvial plain and flood plain. **Community structure**: The VIS classification describes PCT 158 as a tall shrubland to two metres high, dominated by Old Man Saltbush (*Atriplex nummularia*). This vegetation zone is dominated by *Atriplex nummularia*. **Species assemblage**: Out of the 37 species recorded in this vegetation zone, 7 are characteristic species for PCT 158, as identified by the VIS classification. Characteristic species include *Atriplex nummularia, Sclerolaena obliquicuspis, Dissocarpus paradoxus, Rhagodia spinescens, Daucus glochidiatus, Sida intricata and Rhodanthe moschata with occurrences of Austrostipa nitida, Convolvulus remotus* and *Tetragonia moorei.*

PCT Name	PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)
	Other PCTs considered: PCT 58, PCT 143 and PCT 220 were all considered in the VIS classification. They were discounted as they were lacking *Atriplex nummularia* in their description which is a dominant species in the vegetation zone in the Subject Land.
BC Act Status	The Artesian Springs Ecological Community in the Great Artesian Basin Critically Endangered Ecological Community CEEC is 'in part' associated with PCT 158. It was determined that the vegetation zone does not conform to the CEEC as the Project Area is not within the Great Artesian Basin.
EPBC Act Status	This PCT does not correspond with any EPBC Act listed ecological communities.

4.3 Threatened Ecological Communities

None of the PCTs identified in the Project Area conform to any TECs listed under the BC Act or EPBC Act.

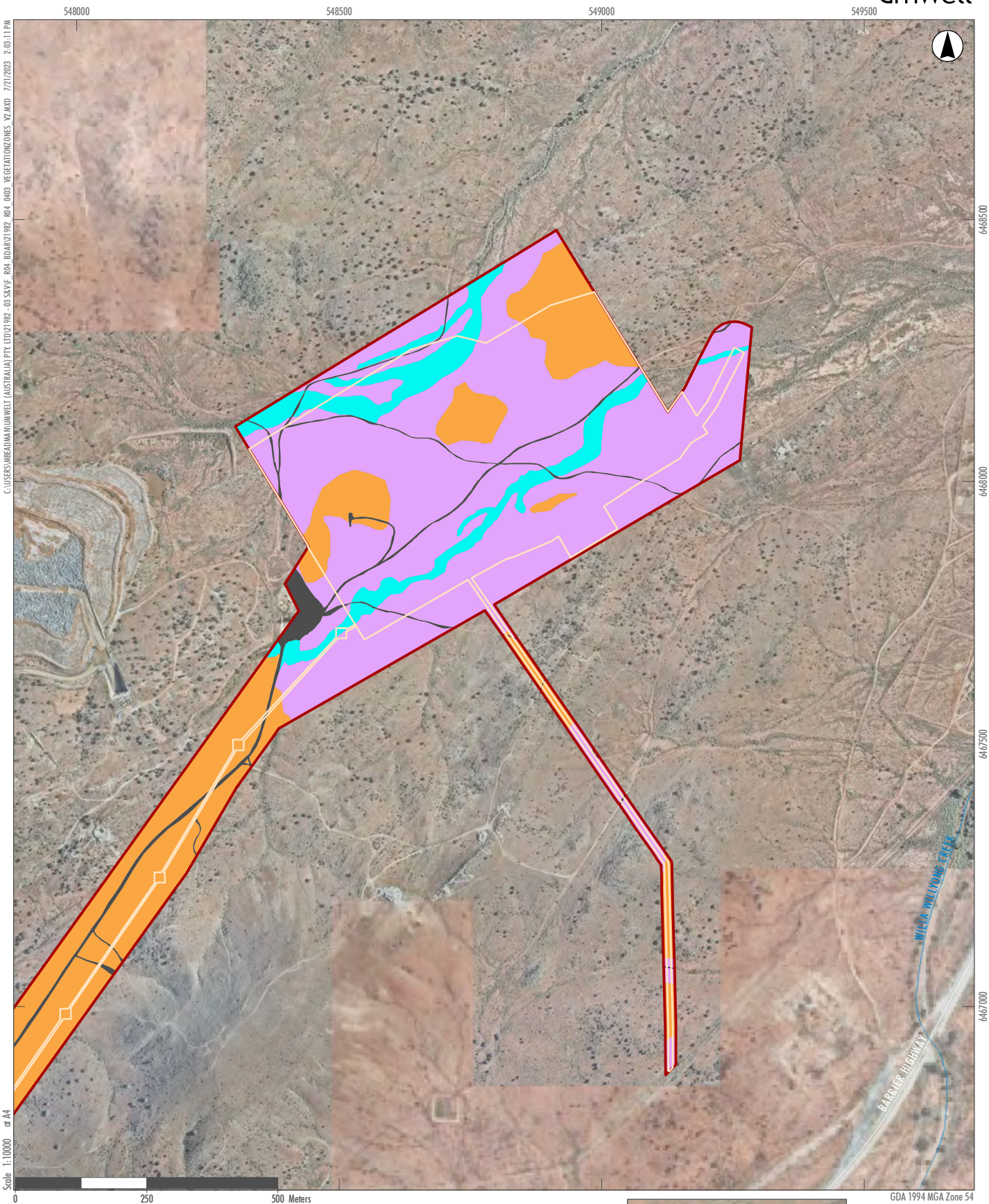
4.4 Vegetation Zones

A description of each Vegetation Zone within the Subject Land is provided in **Section 4.2** of this Report. A map of the Vegetation Zones is provided in **Figure 4.3** and the details of each Vegetation Zone including area, patch size class and the BAM survey plots required and completed are provided in **Table 4.19**.

Table 4.19 Vegetation Condition Zones and patch sizes

Vegetation Condition Zone ID	Plant Community Type ID and Name	Vegetation Zone Condition	Patch Size Class		No. vegetation integrity plots required		No. vegetation integrity plots completed			Plot ID of vegetation integrity plots used in assessment		
			SCES Facility	Transmission Line	SCES Facility	Transmission Line	SCES Facility	Transmission Line	Total	SCES Facility	Transmission Line	Total
1	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone	Derived Shrubland	NA	100 ha	0	1	NA	1	1	NA	P21982_021	1
2		High Weed Cover	NA	100 ha	0	1	NA	1	1	NA	P21982_019	1
3		Planted	NA	100 ha	0	1	NA	1	1	NA	P21982_006	1
4	123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion	Die back	NA	100 ha	0	1	NA	1	1	NA	P21982_011	1
5		Good	100 ha	100 ha	3	2	3	5	8	P21982_031, P21982_032, P21982_033	P21982_004, P21982_008, P_21982_016, P21982_017, P21982_018	8
6	136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone	Disturbed (High Weed Cover)	NA	100 ha	0	1	NA	2	2	NA	P21982_023, P21982_024	2
7		Good	100 ha	100 ha	2	1	3	1	4	P_21982_003, P21982_029, P21982_030	P21982_010	4
8	150 Bottlewasher - Copperburr grassland of the arid zone	Good	NA	100 ha	0	1	NA	2	2	NA	P21982_012, P21982_013	2
9	155 Bluebush shrubland on stony	Disturbed	NA	100 ha	0	1	NA	2	2	NA	P21982_014, P21982_015	2

Vegetation Condition Zone ID	Plant Community Type ID and Name	Vegetation Zone Condition	Patch Size Class		No. vegetation integrity plots required		No. vegetation integrity plots completed			Plot ID of vegetation integrity plots used in assessment		
			SCES Facility	Transmission Line	SCES Facility	Transmission Line	SCES Facility	Transmission Line	Total	SCES Facility	Transmission Line	Total
10	rises and downs in the arid and semi-arid zones	Good	100 ha	100 ha	4	3	4	5	9	P21982_002, P21982_027, P21982_028, P21982_001	P21982_007, P21982_009, P21982_020, P21982_025, P21982_026,	9
11	158 Old Man Saltbush – mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)	Good	NA	100 ha	0	1	NA	2	2	NA	P_21982_005, P_21982_022	2



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

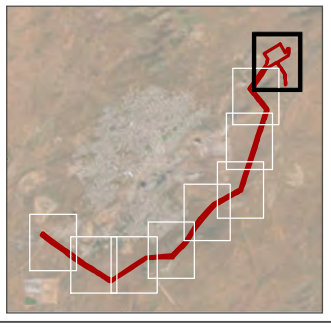


FIGURE 4.3A

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Planted
- Cleared

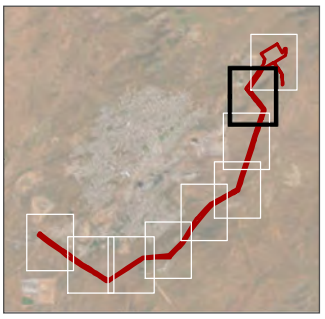


FIGURE 4.3B

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

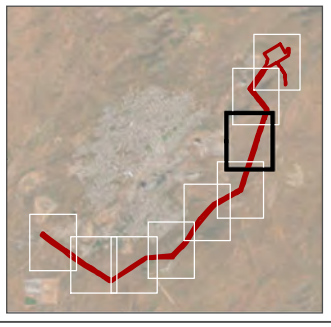
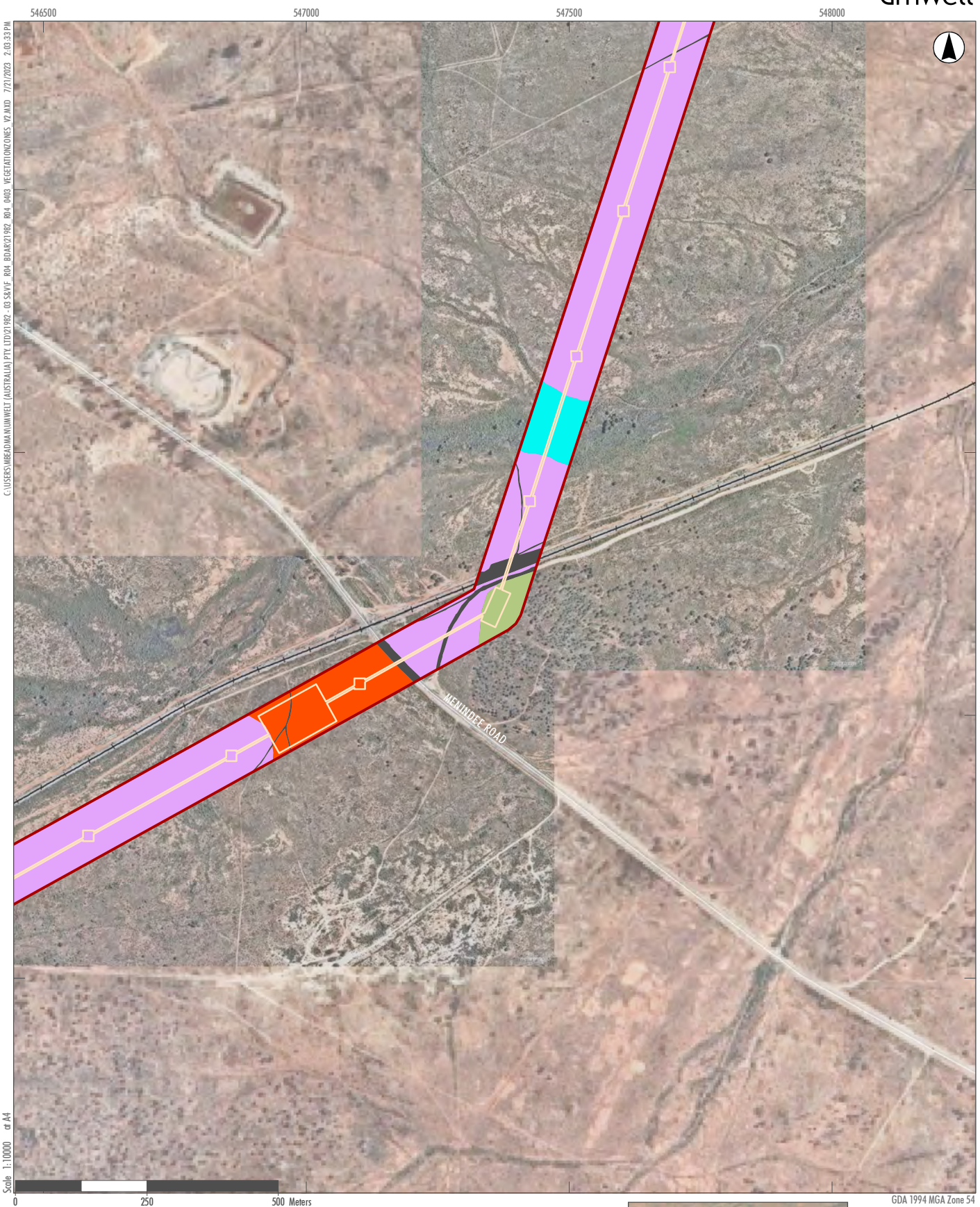


FIGURE 4.3C

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Dieback
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

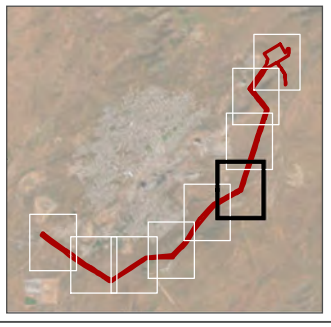


FIGURE 4.3D

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

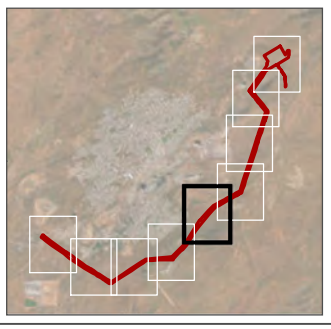
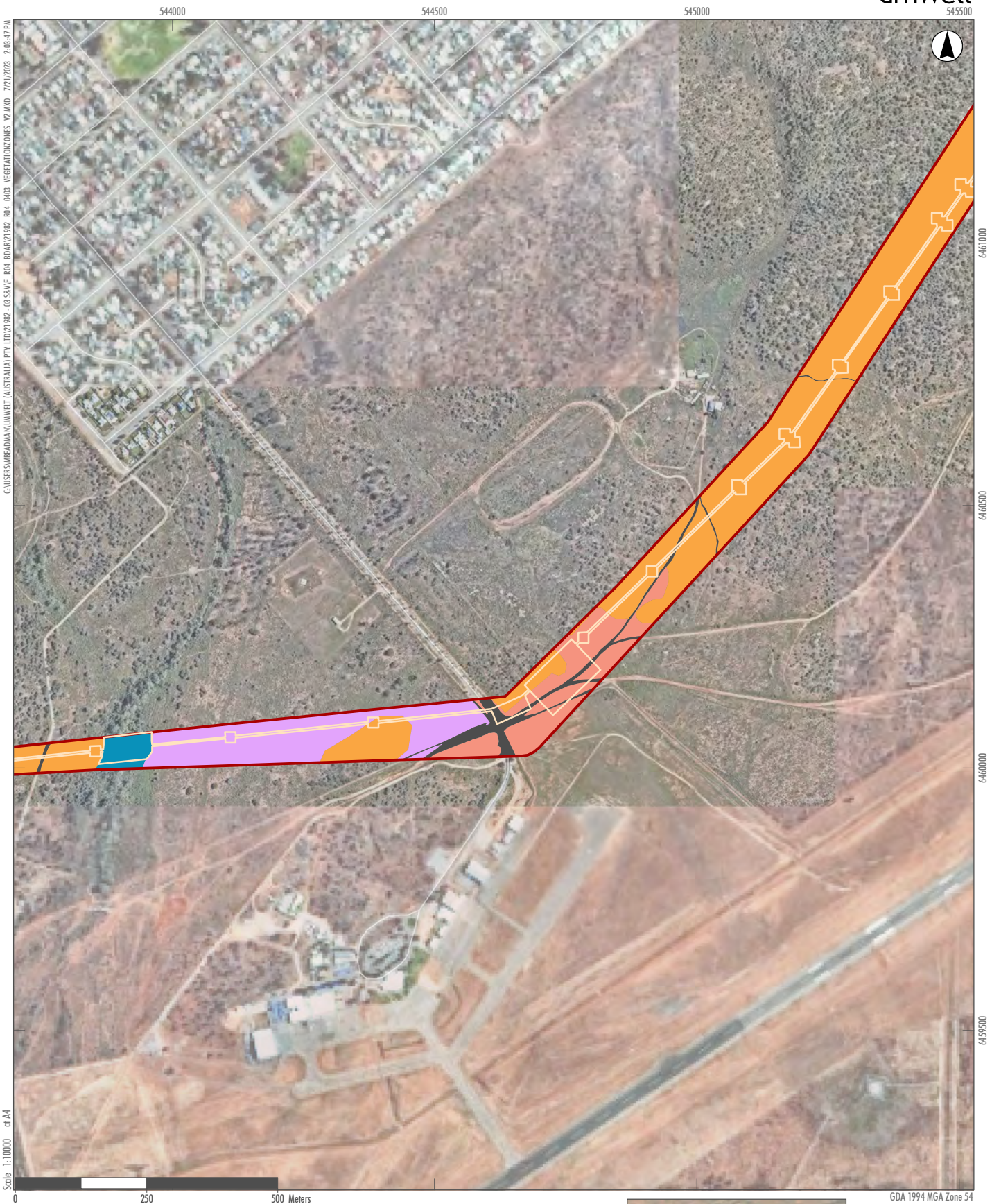


FIGURE 4.3E

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

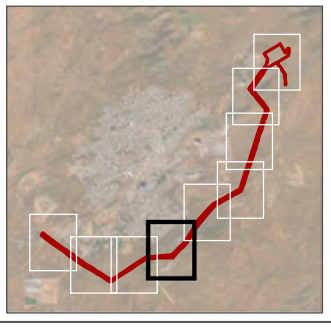


FIGURE 4.3F

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

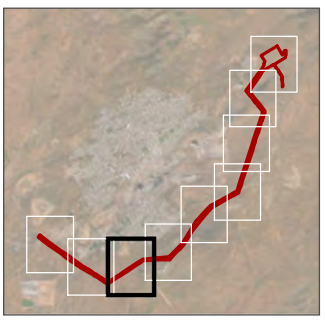
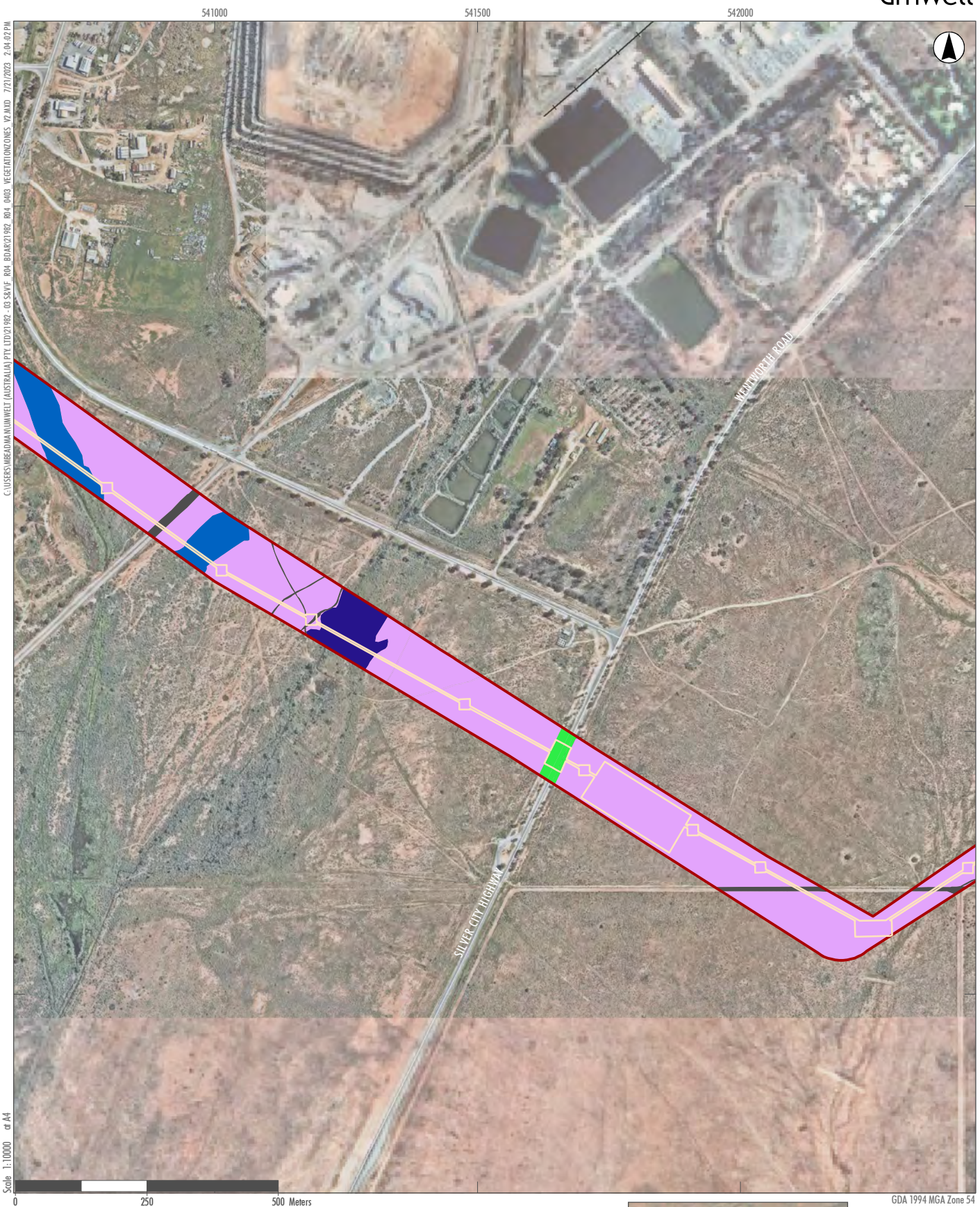


FIGURE 4.3G

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Derived Shrubland
- Cleared
- Planted Street Trees

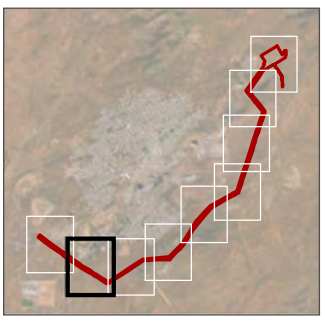
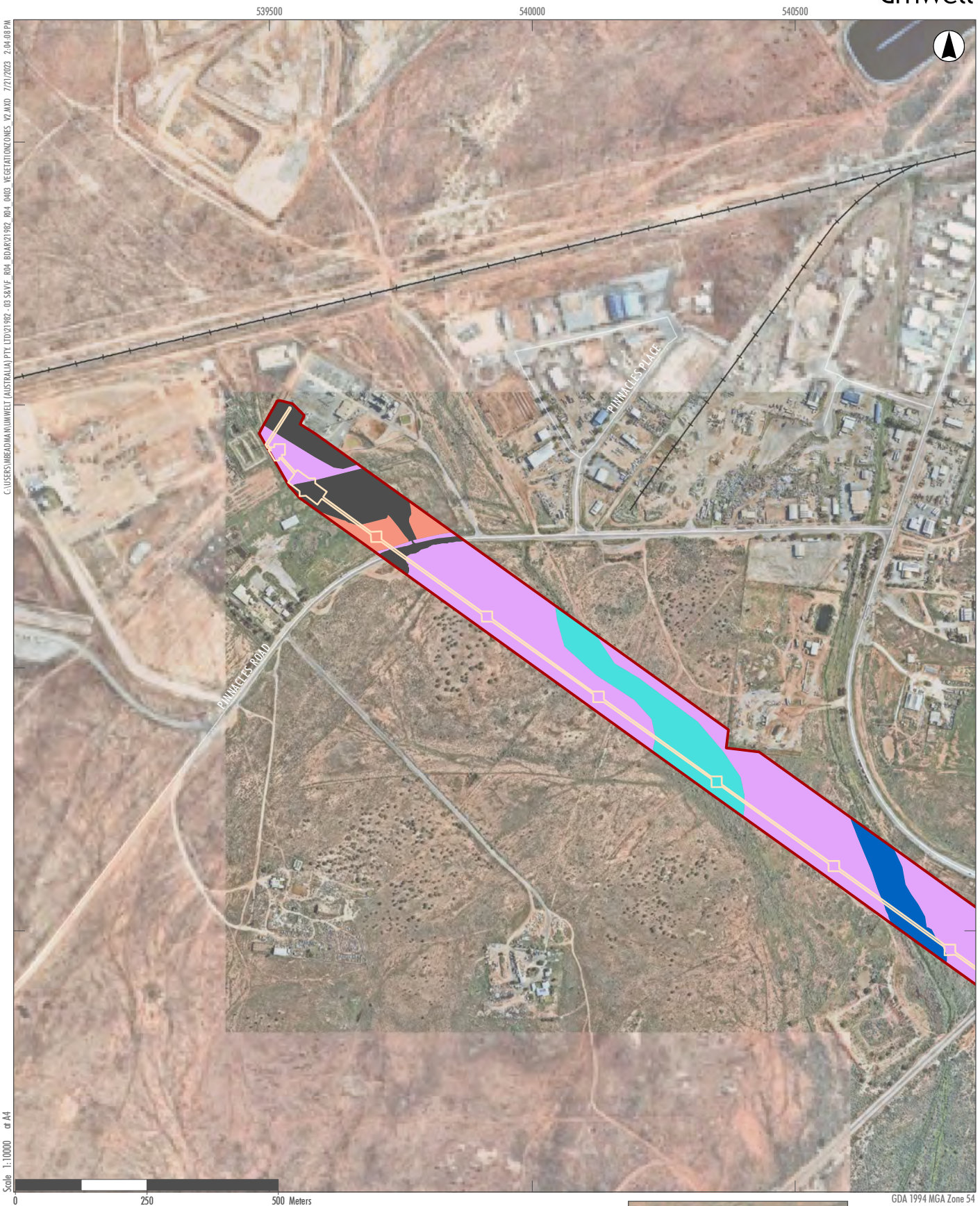


Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE 4.3H

Vegetation Zones



Legend

- Project Area
- Subject Land

Plant Community Type (PCT ID - Name - Condition; Patch Size = 101 ha)

- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Disturbed - High Weed Cover
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- Cleared

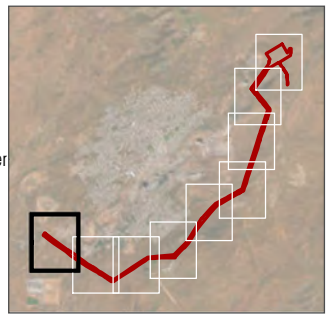


FIGURE 4.3I

Vegetation Zones

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

4.5 Vegetation Integrity (Vegetation Condition)

4.5.1 Vegetation Integrity Survey Plots

Details on the number of BAM plots (floristic and vegetation integrity survey plots) required and completed for each vegetation condition zone, in accordance with Table 3 of the BAM, are provided in **Table 4.19**. The vegetation integrity plot survey locations are shown in **Appendix A,** the flora species recorded in each plot are detailed in **Appendix B** and the vegetation integrity plot survey data is provided in **Appendix C**.

4.5.2 Scores

The vegetation integrity condition scores for the BAM Plots completed are provided in **Table 4.20** and **Table 4.21**. This table represents the combined scores from all plots completed for each vegetation condition zone, including the vegetation integrity score and the presence of hollow bearing trees.

Table 4.20 Vegetation Integrity Scores – SCES Facility

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score*	Vegetation integrity score	Hollow bearing trees present?
5	75.5	42.5	-	56.6	No
7	94.2	32	-	54.9	No
10	69.1	13.6	-	30.6	No

- No function score required for semi-arid shrublands.

Table 4.21 Vegetation Integrity Scores – Transmission Line

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score*	Vegetation integrity score	Hollow bearing trees present?
1	93	53.4	31.9	54.1	No
2	25.4	58	55.3	43.3	No
3	59.6	66.2	27.8	47.9	No
4	78.3	12.2	-	30.9	No
5	87.2	23	-	44.8	No
6	76.6	27.1	-	45.6	No
7	96.7	30.9	-	54.6	No
8	91.1	11.5	-	32.3	No
9	81.7	18.3	-	38.7	No
10	86.6	77.5	-	82	No
11	96.5	31.8	-	55.4	No

No function score required for semi-arid shrublands.

4.5.3 Use of Benchmark Data

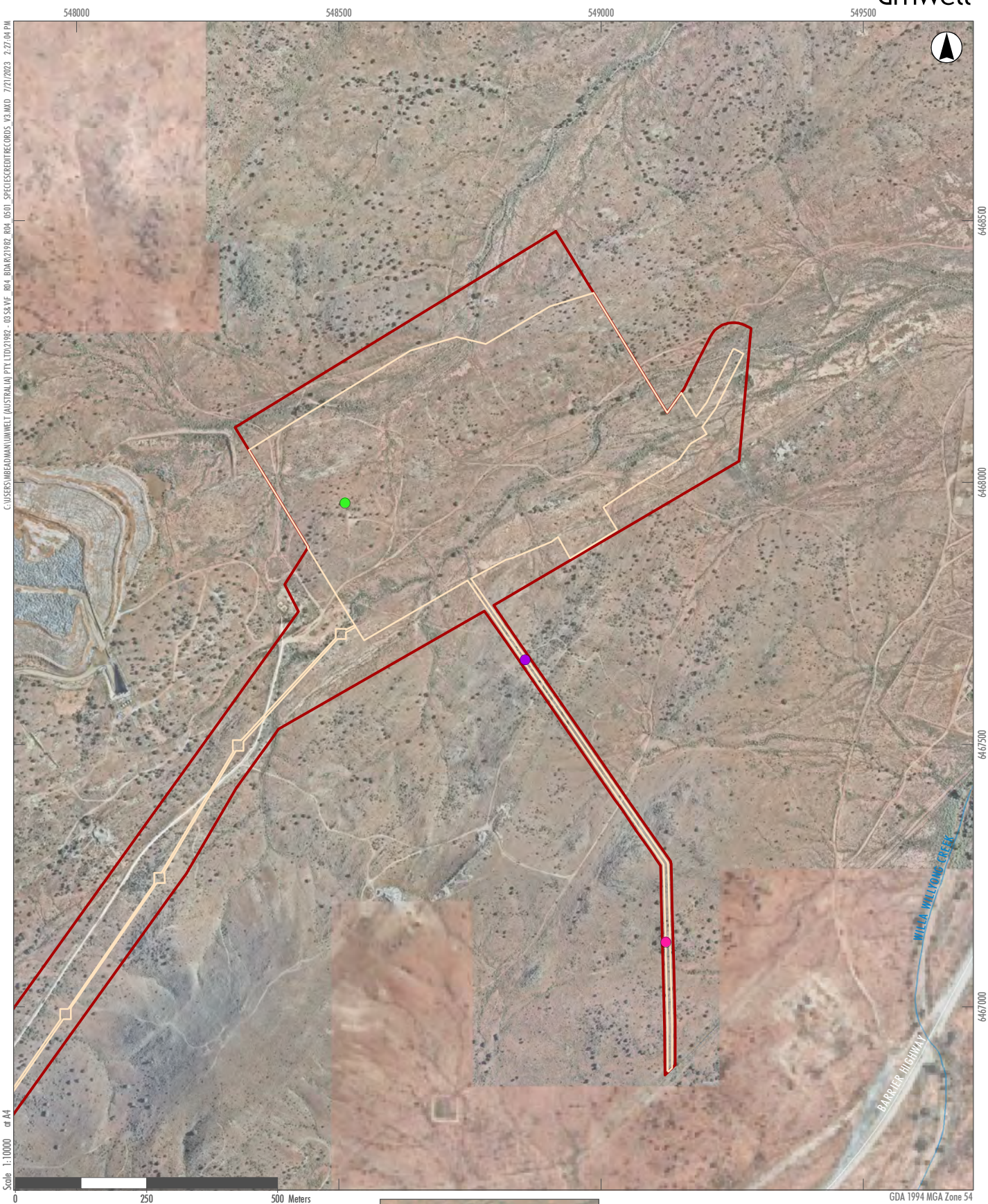
The standard BAM-C benchmark values were used in this assessment for each vegetation zone.

5.0 Habitat Suitability for Threatened Species

5.1 Identification of Threatened Species for Assessment

5.1.1 Ecosystem Credit Species

The ecosystem credit species predicted to occur on or use the Subject Land are identified in **Table 5.1.** No predicted ecosystem credit species were removed from the BAM calculator automatically populated list. Refer to **Figure 5.1** for ecosystem credit species observed within the Project Area.



Legend

- Project Area
- Subject Land

Threatened Species

- *Hieraaetus morphnoides*
- *Pseudomys bolami*
- *Sminthopsis macroura*

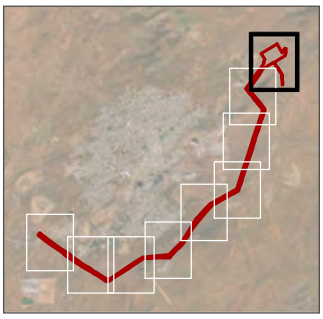


FIGURE 5.1A

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

FIGURE 5.1B

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Threatened Species

- *Hieraaetus morphnoides*

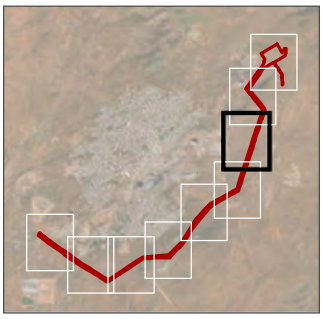


FIGURE 5.1C

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Threatened Species

- *Pyrrholaemus brunneus*

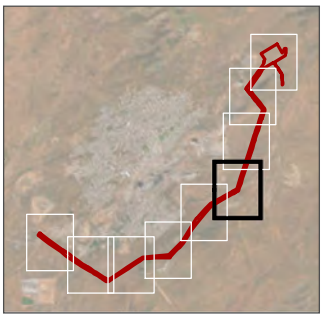


FIGURE 5.1D

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Threatened Species

- *Pyrrholaemus brunneus*

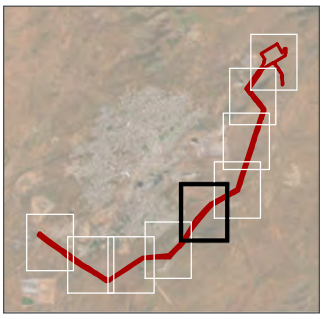


FIGURE 5.1E

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Threatened Species

- *Pyrrholaemus brunneus*

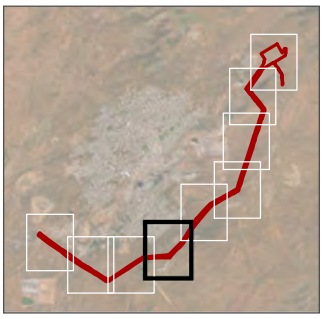


FIGURE 5.1F

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Threatened Species

- *Pseudomys bolami*

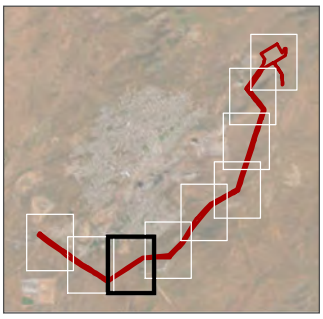


FIGURE 5.1G

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Threatened Species

- *Epthianura albifrons*
- *Pseudomys bolami*
- *Pyrrholaemus brunneus*

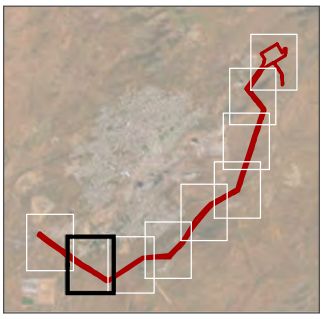


FIGURE 5.1H

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Transgrid Substation

Threatened Species

- *Epthianura albifrons*
- *Pyrrholaemus brunneus*

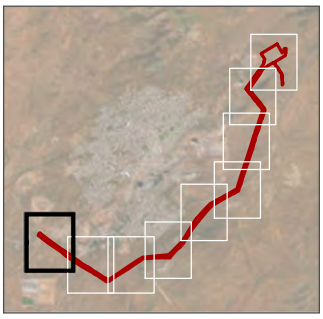


FIGURE 5.1I

Ecosystem Credit Species Records

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Table 5.1 Predicted ecosystem credit species for SCES Facility and Transmission Line

Common name	Scientific name	Listing status		Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification for any Exclusions	Associated PCT and Condition Zone species retained within	Sensitivity to gain class
		BC Act	EPBC Act							
Black falcon	*Falco subniger*	V	-	No	BAM-C	NA	Yes	N/A	41 123 150 155 158	Moderate
Black-breasted Buzzard	*Hamirostra melanosternon*	V	-	Yes	BAM-C	Land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts	Yes	N/A	41 158	Moderate
Bolam's Mouse	*Pseudomys bolami*	E	-	No	BAM-C **Identified during surveys**	NA	Yes	N/A	155	High
Brolga	*Grus rubicunda*	V	-	No	BAM-C	NA	Yes	N/A	41 158	Moderate
Dusky Hopping-mouse	*Notomys fuscus*	E	V	No	BAM-C	NA	Yes	N/A	41 136 155	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification for any Exclusions	Associated PCT and Condition Zone species retained within	Sensitivity to gain class
		BC Act	EPBC Act							
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	No	BAM-C	NA	Yes	N/A	41 123 150 155 158	Moderate
Flock Bronzewing	*Phaps histrionica*	E	-	No	BAM-C	NA	Yes	N/A	123 136 150 155 158	High
Forrest's Mouse	*Leggadina forresti*	V	-	No	BAM-C	NA	Yes	N/A	123 136 150 155 158	High
Grey Falcon	*Falco hypoleucos*	E	-	No	BAM-C	NA	Yes	N/A	41 123 136 150 155 158	Moderate
Hall's Babbler	*Pomatostomus halli*	V	-	No	BAM-C	NA	Yes	N/A	123	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification for any Exclusions	Associated PCT and Condition Zone species retained within	Sensitivity to gain class
		BC Act	EPBC Act							
Kultarr	*Antechinomys laniger*	E	-	No	BAM-C	NA	Yes	N/A	41 123 136 150 155 158	High
Little Eagle	*Hieraaetus morphnoides*	V	-	Yes	BAM-C **Identified during surveys**	Nest trees - live (occasionally dead) large old trees within vegetation.	Yes	N/A	41 123 136 150 155 158	Moderate
Little Pied Bat	*Chalinolobus picatus*	V	-	No	BAM-C	NA	Yes	N/A	41 123 136 150 155 158	High
Long-haired Rat	*Rattus villosissimum*	V	-	No	BAM-C	NA	Yes	N/A	41 136 155 158	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification for any Exclusions	Associated PCT and Condition Zone species retained within	Sensitivity to gain class
		BC Act	EPBC Act							
Pink Cockatoo (formerly Major Mitchell's Cockatoo)	*Lophochroa leadbeateri*	V	-	Yes	BAM-C	Living or dead tree with hollows greater than 10cm diameter	Yes	N/A	41 123 136 150 155 158	Moderate
Masked Owl	*Tyto novaehollandiae*	V	-	Yes	BAM-C	Living or dead trees with hollows greater than 20cm diameter.	Yes	N/A	41	High
Pied Honeyeater	*Certhionyx variegatus*	V	-	No	BAM-C	NA	Yes	N/A	41 123 136 155 158	Moderate
Plains-wanderer	*Pedionomus torquatus*	E	CE	Yes	BAM-C	As per mapped areas	Yes	N/A	150	High
Redthroat	*Pyrrholaemus brunneus*	V	-	No	BAM – C **Identified during surveys**	NA	Yes	N/A	136 155 158	Moderate
Ringed Brown Snake	*Pseudonaja modesta*	E	-	No	BAM-C	NA	Yes	N/A	41 123 136	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification for any Exclusions	Associated PCT and Condition Zone species retained within	Sensitivity to gain class
		BC Act	EPBC Act							
									150 155 158	
Rufous Fieldwren	*Calamanthus campestris*	V	-	No	BAM-C	NA	Yes	N/A	155	Moderate
Sandy Inland Mouse	*Pseudomys hermannsburgensis*	V	-	No	BAM-C	NA	Yes	N/A	123 136 150 155	High
Scarlet-chested Parrot	*Neophema splendida*	V	-	No	BAM-C	NA	Yes	N/A	123	High
Spotted Harrier	*Circus assimilis*	V	-	No	BAM-C **Identified during surveys**	NA	Yes	N/A	41 123 136 150 155 158	Moderate
Square-tailed Kite	*Lophoictinia isura*	V	-	Yes	BAM-C	Nest trees	Yes	N/A	41	Moderate
Stripe-faced Dunnart	*Sminthopsis macroura*	V	-	No	BAM-C **Identified during surveys**	NA	Yes	N/A	41 123 136 150 155 158	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification for any Exclusions	Associated PCT and Condition Zone species retained within	Sensitivity to gain class
		BC Act	EPBC Act							
Varied Sittella	*Daphoenositta chrysoptera*	V	-	No	BAM-C	NA	Yes	N/A	41	Moderate
Wedgesnout Ctenotus	*Ctenotus brooksi*	V	-	No	BAM-C	NA	Yes	N/A	123 136 150 155	High
White-fronted Chat	*Epthianura albifrons*	V	-	No	BAM-C	NA	Yes	N/A	150 155 158	Moderate
Woma	*Aspidites ramsayi*	V	-	No	BAM-C	NA	Yes	N/A	41 123 136 155 158	High
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	No	BAM-C	NA	Yes	N/A	41 136 158	High

5.1.2 Species Credit Species

5.1.2.1 Predicted Flora Species Credit Entities

The flora species credit species predicted to occur on the Subject Land are identified in **Table 5.2**.

No species credit species were removed from the BAM calculator automatically populated candidate species list.

Surveying threatened plants and their habitats DPIE (2020b) identifies that only the suitable habitat for the target species within the Subject Land needs to be surveyed and includes areas on the Subject Land supporting any listed habitat constraints and PCTs associated with that species in the TBDC. In this context DPIE (2020b) also identify that suitable habitat for threatened flora may encompass entire PCTs or be restricted to niches determined with consideration of habitat constraints, land use history, disturbance events and climatic factors. The TBDC and the Threatened Species Profile website, along with appropriate published or peer-reviewed references and/or data must be used to determine suitable habitat (DPIE 2020b).

Table 5.2 Predicted flora species credit species SCES Facility and Transmission Line

Common name	Scientific name	Listing status		Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification if excluded from further assessment	PCT and Vegetation Condition Zone species retained within
		BC Act	EPBC Act					
Purple-wood Wattle	*Acacia carneorum*	V	V	Bionet	NA	Yes	N/A	No associated PCTs, surveyed across all PCTs.
Mallee Golden Wattle	*Acacia notabilis*	E	-	BAM-C	NA	Yes	NA	123 – All Zones 155 – All Zones
Creek Wattle	*Acacia rivalis*	E	-	BAM-C	NA	Yes	NA	123 – All Zones
A saltbush	*Atriplex infrequens*	V	V	BAM-C	NA	Yes	NA	136 – All Zones 158
Bindweed	*Convolvulus tedmoorei*	E	-	BAM-C	NA	Yes	NA	158
Spike-Rush	*Eleocharis obicis*	V	V	BAM-C	Semi-permanent/ephemeral wet areas Periodically waterlogged sites (including table drains and farm dams))	Yes	NA	136 – All Zones 158
Showy Indigo	*Indigofera longibractea*	E	-	BAM-C	Rocky creekbeds and drainage lines or within 100 m Rocky hills, scarps, slopes and ridges or within 100 m	Yes	NA	123 – All Zones 155 – All Zones
Yellow-Keeled Swainsona	*Swainsona flavicarinata*	E	-	BAM-C	NA	Yes	NA	150 – All Zones 155 – All Zones
Slender Darling Pea	*Swainsona murrayana*	V	V	BAM-C	NA	Yes	NA	155 – All Zones

Common name	Scientific name	Listing status		Sources	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification if excluded from further assessment	PCT and Vegetation Condition Zone species retained within
		BC Act	EPBC Act					
Creeping Darling Pea	*Swainsona viridis*	E	-	BAM-C	NA	Yes	NA	123 – All Zones 155 – All Zones

5.1.2.2 Threatened fauna candidate species

The fauna species credit species predicted to occur on the Subject Land are identified in **Table 5.3**. No candidate fauna species were recorded within the Subject Land or wider Project Area.

No species credit species were removed from the BAM calculator automatically populated candidate species list.

Table 5.3 Candidate threated fauna species credit species SCES Facility and Transmission Line

Common name	Scientific name	Listing status		Sources	Dual credit species	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification if excluded from further assessment	PCT and Vegetation Condition Zone species retained within
		BC Act	EPBC Act						
Australian Bustard	*Ardeotis australis*	E	-	BAM-C	No	NA	Yes	NA	150 – All Zones 155 – All Zones
Barrier Range Dragon	*Ctenophorus mirrityana*	E	-	BAM-C	No	Rocky areas Requires rock crevices	Yes	NA	123 – All Zones 155 – All Zones
Black-breasted Buzzard	*Hamirostra melanosternon*	V	-	BAM-C	Yes	Waterbodies Land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts	Yes	NA	41 – All Zones
Bush Stone-curlew	*Burhinus grallarius*	E	-	BAM-C	No	Fallen/standing dead timber including lots	Yes	NA	150 – All Zones
Crowned Gecko	*Lucasium stenodactylum*	V	-	BAM-C	No	NA	Yes	NA	123 – All Zones 150 – All Zones 155 – All Zones
Eastern Fat-tailed Gecko	*Diplodactylus platyurus*	E	-	BAM-C	No	NA	Yes	NA	123 – All Zones 150 – All Zones
Little Eagle	*Hieraaetus morphnoides*	V	-	BAM-C	Yes	Nest trees - live (occasionally dead) large old trees within vegetation.	Yes	NA	41 – All Zones 123 – All Zones 150 – All Zones 155 – All Zones
Pink Cockatoo (formerly Major Mitchell's Cockatoo)	*Lophochroa leadbeateri*	V	-	BAM-C	Yes	Hollow bearing trees Living or dead tree with hollows greater than 10cm diameter	Yes	NA	41 – All Zones 123 – All Zones 150 – All Zones 155 – All Zones

Common name	Scientific name	Listing status		Sources	Dual credit species	Habitat Constraints / Geographic Limitations	Species retained for further assessment?	Justification if excluded from further assessment	PCT and Vegetation Condition Zone species retained within
		BC Act	EPBC Act						
Masked Owl	*Tyto novaehollandiae*	V	-	BAM-C	Yes	Hollow bearing trees Living or dead trees with hollows greater than 20 cm diameter.	Yes	NA	41 – All Zones
Plains – wanderer	*Pedionomus torquatus*	E	CE	BAM-C	Yes	As per mapped areas	No	No mapped area	150 – All Zones
Square-tailed Kite	*Lophoictinia isura*	V	-	BAM-C	Yes	Nest trees	Yes	NA	41 – All Zones
Stimson's Python	*Antaresia stimsoni*	V	-	BAM-C	No	Rocky areas Areas within 500 m of rocks or gibber	Yes	NA	123 – All Zones 150 – All Zones
Thick-billed Grasswren (north-west NSW subspecies)	*Amytornis modestus obscurior*	CE	CE	BAM-C	No	NA	Yes	NA	155 – All Zones

5.2 Presence of Candidate Species Credit Species

5.2.1 Threatened Flora Species

No threatened flora species were observed within the Subject Land or wider Project Area during the surveys. Targeted surveys have been completed for all candidate threatened flora species. However, following Spring 2022 surveys the Project Area was modified which resulted in additional areas added to the Project Area. Field surveys were then conducted in Summer 2023 to survey these new areas for the threatened species in season in February 2023, however not all candidate species were in season. Approximately 12.39 ha has not been surveyed in spring and applicable species have been assumed present according to PCT associations as listed in the TBDC. Following the February survey minor refinements to the Project Area resulted in an additional area being added (approximately 0.22 ha). No surveys have been conducted within this additional area. As a result, some candidate species presence has been assumed for the areas where surveys have not been completed in the appropriate season. Refer to **Figure 5.2** for a visual aid in understanding the changes to the Project Area/Subject Land. For areas that have not been surveyed, species presence has been assumed. The species polygon for these species was based on the new areas, associated PCTs and seasonal survey requirements. The unsurveyed areas of the Subject Land are located in the SCES Facility Area only, there is no assumed presence in the transmission line component of the Project.

A summary of the methods used and determination of presence for candidate threatened flora species credit species is provided in **Table 5.4**. All species listed as requiring further assessment have been assumed present in the absence of complete seasonal targeted surveys in part of the Subject Land.

Table 5.4 Determining the presence of candidate flora species credit species on the Subject Land

Common name	*Scientific name*	Listing status		Method used to determine presence	Present?	Further assessment required?
		BC Act	EPBC Act			
Purple-wood Wattle	*Acacia carneorum*	V	V	Targeted threatened species survey	No	No
Mallee Golden Wattle	*Acacia notabilis*	E	-	Targeted threatened species survey	No	Yes
Creek Wattle	*Acacia rivalis*	E	-	Targeted threatened species survey	No	Yes
Atriplex infrequens	*Atriplex infrequens*	V	V	Targeted threatened species survey	No	No
Convolvulus tedmoorei	*Convolvulus tedmoorei*	E	-	Targeted threatened species survey	No	No
Spike-rush	*Eleocharis obicis*	V	V	Targeted threatened species survey	No	No

Common name	*Scientific name*	Listing status		Method used to determine presence	Present?	Further assessment required?
		BC Act	EPBC Act			
Showy Indigo	*Indigofera longibractea*	E	-	Targeted threatened species survey	No	Yes
Yellow-Keeled Swainsona	*Swainsona flavicarinata*	E	-	Targeted threatened species survey	No	Yes
Slender Darling Pea	*Swainsona murrayana*	V	V	Targeted threatened species survey	No	Yes
Creeping Darling Pea	*Swainsona viridis*	E	-	Targeted threatened species survey	No	Yes

5.2.2 Threatened Fauna Surveys

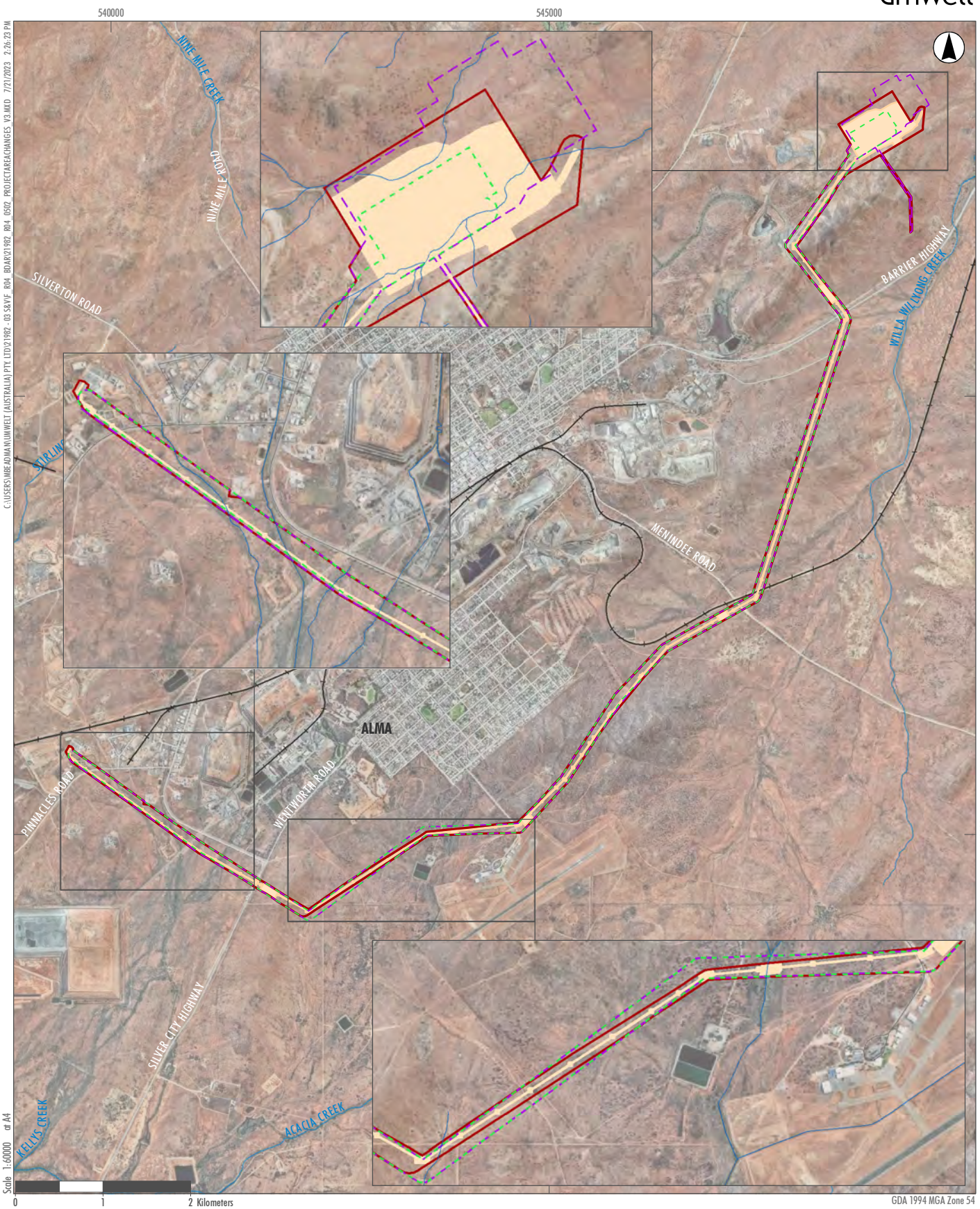
No threatened fauna species credit species were observed within the Subject Land or wider Project Area during the targeted surveys completed.

A summary of the methods used and determination of presence for candidate threatened fauna species credit species is provided in **Table 5.5**.

Table 5.5 Determining the presence of candidate fauna species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required?
		BC Act	EPBC Act			
Australian Bustard	*Ardeotis australis*	E	-	Targeted threatened species survey	No	No
Barrier Range Dragon	*Ctenophorus mirrityana*	E	-	Targeted threatened species survey	No	No
Black-breasted Buzzard	*Hamirostra melanosternon*	V	-	Targeted threatened species survey	No	No
Bush Stone-curlew	*Burhinus grallarius*	E	-	Targeted threatened species survey	No	No
Crowned Gecko	*Lucasium stenodactylum*	V	-	Targeted threatened species survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required?
		BC Act	EPBC Act			
Eastern Fat-tailed Gecko	*Diplodactylus platyurus*	E	-	Targeted threatened species survey	No	No
Little Eagle	*Hieraaetus morphnoides*	V	-	Targeted threatened species survey	No	No
Pink Cockatoo (formerly Major Mitchell's Cockatoo)	*Lophochroa leadbeateri*	V	-	Targeted threatened species survey	No	No
Masked Owl	*Tyto novaehollandiae*	V	-	Targeted threatened species survey	No	No
Plains – wanderer	*Pedionomus torquatus*	E	CE	Targeted threatened species survey	No	No
Square-tailed Kite	*Lophoictinia isura*	V	-	Targeted threatened species survey	No	No
Stimson's Python	*Antaresia stimsoni*	V	-	Targeted threatened species survey	No	No
Thick-billed Grasswren (north-west NSW subspecies)	*Amytornis modestus obscurior*	CE	CE	Targeted threatened species survey	No	No



Legend

- Project Area
- Subject Land
- September 2022 Project Area
- February 2023 Project Area
- Drainage Line
- Railway Line
- Road

FIGURE 5.2

Project Area Changes

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

5.3 Threatened Species Surveys

A summary of the targeted surveys completed for candidate threatened flora species is provided in **Table 5.6**, further details of the threatened flora surveys completed, and guidelines applied are provided in **Appendix A** of this Report. As previously discussed, minor project changes occurred following the completion of the targeted surveys, so some species have been completely surveyed across the Subject Land whereas assumed presence has occurred within the area associated with the SCES facility that has not been subject to seasonal survey for select species (refer to **Figure 5.3** to **Figure 5.8**).

Table 5.6 Summary of Species Credit Threatened Flora Surveys Completed

Common Name	Scientific Name	Threatened Flora species surveys			Present	Further assessment required
		Survey Method	Timing of survey within recommended period?	Survey effort (hours & no people)		
Purple-wood Wattle	*Acacia carneorum*	Large Survey Area Method	Yes	17 x survey days completed (~10 hours) x 2 ecologists 17–19 May 2022 27 June–1 July 2022 26–30 September 2022 22–23 November 2022 27–28 February 2022	No	No
Mallee Golden Wattle	*Acacia notabilis*	Large Survey Area Method	Yes	17 x survey days completed (~10 hours) x 2 ecologists 17–19 May 2022 27 June–1 July 2022 26-30 September 2022 22–23 November 2022 27–28 February 2022	Assumed present (areas not subject to seasonal surveys)	Yes
Creek Wattle	*Acacia rivalis*	Large Survey Area Method	Yes	17 x survey days completed (~10 hours) x 2 ecologists 17–19 May 2022 27 June–1 July 2022 26–30 September 2022 22–23 November 2022 27–28 February 2022	Assumed present (areas not subject to seasonal surveys)	Yes

Common Name	Scientific Name	Threatened Flora species surveys			Present	Further assessment required
		Survey Method	Timing of survey within recommended period?	Survey effort (hours & no people)		
Atriplex infrequens	*Atriplex infrequens*	Large Survey Area Method	Yes	4 x survey days completed (~10 hours) x 2 ecologists 22–23 November 2022 27–28 February 2022	No	No
Convolvulus tedmoorei	*Convolvulus tedmoorei*	Large Survey Area Method	Yes	5 x survey days completed (~10 hours) x 2 ecologists 26–30 September 2022	No	No
Spike-rush	*Eleocharis obicis*	Large Survey Area Method	Yes	7 x survey days completed (~10 hours) x 2 ecologists 26–30 September 2022 22–23 November 2022	No	No
Showy Indigo	*Indigofera longibractea*	Large Survey Area Method	Yes	17 x survey days completed (~10 hours) x 2 ecologists 17–19 May 2022 27 June–1 July 2022 26–30 September 2022 22–23 November 2022 27–28 February 2022	Assumed present (areas not subject to seasonal surveys)	Yes
Yellow-Keeled Swainsona	*Swainsona flavicarinata*	Large Survey Area Method	Yes	10 x survey days completed (~10 hours) x 2 ecologists 27 June–1 July 2022 26–30 September 2022	Assumed present (areas not subject to seasonal surveys)	Yes
Slender Darling Pea	*Swainsona murrayana*	Large Survey Area Method	Yes	5 x survey days completed (~10 hours) x 2 ecologists 26–30 September 2022	Assumed present (areas not subject to seasonal surveys)	Yes

Common Name	Scientific Name	Threatened Flora species surveys			Present	Further assessment required
		Survey Method	Timing of survey within recommended period?	Survey effort (hours & no people)		
Creeping Darling Pea	Swainsona viridis	Large Survey Area Method	Yes	5 x survey days completed (~10 hours) x 2 ecologists 26–30 September 2022	Assumed present (areas not subject to seasonal surveys)	Yes

A summary of the targeted surveys completed for candidate threatened fauna species is provided in **Table 5.7**, further details of the threatened fauna surveys completed, survey timing and guidelines followed are provided in **Appendix A** of this Report.

Table 5.7 Summary of species credit threatened fauna surveys completed

Common Name	Scientific Name	Threatened Fauna species surveys			Present	Further assessment required
		Survey Method	Timing of survey within recommended period?	Survey effort (hours & no people)		
Australian Bustard	*Ardeotis australis*	Diurnal surveys Remote Cameras	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023 Camera trapping = 10 cameras (18/9/22 to 22/11/2022 – 66 nights) 10 cameras (27/2/23 to 3/3/23 – 7 nights)	No	No
Barrier Range Dragon	*Ctenophorus mirrityana*	Diurnal searches in potential habitat, pit fall lines and remote cameras.	Yes	Diurnal searches 21-24 November 2022 and 2 March 2023 Traps: 3 x pitfall traps, 3 x funnel traps, 4 trap nights 21-25 November 2022 Camera trapping = 10 cameras (18/9/22 to 22/11/2022 – 66 nights) 10 cameras (27/2/23 to 3/3/23 – 7 nights)	No	No
Black-breasted Buzzard (breeding habitat)	*Hamirostra melanosternon*	Diurnal fauna surveys Searches for large stick nests during all surveys. No large stick nests observed across subject land.	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023	No	No
Bush Stone-curlew	*Burhinus grallarius*	Diurnal and nocturnal searches / call playback. Remote cameras.	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023 Camera trapping =	No	No

Common Name	Scientific Name	Threatened Fauna species surveys			Present	Further assessment required
		Survey Method	Timing of survey within recommended period?	Survey effort (hours & no people)		
				10 cameras (18/9/22 to 22/11/2022 – 66 nights) 10 cameras (27/2/23 to 3/3/23 – 7 nights) Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights) 21 – 25 November, 27 Feb - 2 March Call play back: 2 x rounds per night. 23 to 24 November 2022 27 February to 1 March 2023 (3 nights)		
Crowned Gecko	*Lucasium stenodactylum*	Nocturnal searches in potential habitat and pit fall lines completed with reference to relevant guidelines. Remote detection fauna surveys	Yes	Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights) Traps: 3 x pitfall, 3 x funnel, 4 trap nights. 21-25 November 2022 Camera trapping = 10 cameras (18/9/22 to 22/11/2022 – 66 nights) 10 cameras (27/2/23 to 3/3/23 – 7 nights)	No	No
Eastern Fat-tailed Gecko	*Diplodactylus platyurus*	Nocturnal searches in potential habitat and pit fall lines completed with reference to relevant guidelines. Remote detection fauna surveys	Yes	Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights) 21 – 25 November, 27 Feb – 2 March Camera trapping = 10 cameras (18/9/22 to 22/11/2022 – 66 nights) 10 cameras (27/2/23 to 3/3/23 – 7 nights) Traps: 3 x pitfall traps, 3 x funnel traps, 4 trap nights. 21-25 November 2022	No	No

Common Name	Scientific Name	Threatened Fauna species surveys			Present	Further assessment required
		Survey Method	Timing of survey within recommended period?	Survey effort (hours & no people)		
Little Eagle (breeding habitat)	*Hieraaetus morphnoides*	Diurnal fauna surveys Searches for large stick nests. No large stick nests observed across subject land.	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023	No	No
Pink Cockatoo (formerly Major Mitchell's Cockatoo) (breeding habitat)	*Lophochroa leadbeateri*	Searches for hollow bearing trees completed. No hollow bearing trees observed across subject land.	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023	No	No
Masked Owl (breeding habitat)	*Tyto novaehollandiae*	Searches for hollow bearing trees completed. No hollow bearing trees observed across subject land.	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023	No	No
Plains – wanderer	*Pedionomus torquatus*	Diurnal surveys conducted. Subject Land is not within important area habitat mapping.	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal and nocturnal searches 21-24 November 2022 and 2 March 2023	No	No
Square-tailed Kite	*Lophoictinia isura*	Diurnal fauna surveys. Searches for large stick nests. No large stick nests observed across subject land.	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023	No	No

Common Name	Scientific Name	Threatened Fauna species surveys			Present	Further assessment required
		Survey Method	Timing of survey within recommended period?	Survey effort (hours & no people)		
Stimson's Python	*Antaresia stimsoni*	Nocturnal searches in potential habitat and pit fall/funnel lines completed with reference to relevant guidelines. Remote detection fauna surveys	Yes	Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights) 21 – 25 November, 27 Feb – 2 March Camera trapping = 10 cameras (18/9/22 to 22/11/2022 – 66 nights) 10 cameras (27/2/23 to 3/3/23 – 7 nights) Traps: 3 x pitfall, 3 x funnel, 4 trap nights. 21-25 November 2022	No	No
Thick-billed Grasswren (north-west NSW subspecies)	*Amytornis modestus obscurior*	Diurnal fauna surveys. Opportunistic diurnal surveys	Yes	17 x survey days completed (~10 hours) x 2 ecologists Diurnal searches 21-24 November 2022 and 2 March 2023	No	No

5.4 Expert Reports and Use of More Appropriate Local Data

No expert reports were utilised in place of targeted surveys for the purposes of this assessment. This assessment has also not relied upon alternative data (more appropriate local data) to assess habitat suitability.

5.5 Area or Count, and Location of Suitable Habitat for a Species Credit Species (A Species Polygon)

As stated in **Section 5.2.1** changes to the Project Area/Subject Land during the biodiversity assessment resulted in areas being added to the Project Area that were not able to be surveyed in entirety for flora species. Fauna species have been adequately surveyed across the Project Area. Refer to **Figure 5.2** for overview of areas without complete threatened flora survey.

While no candidate species were observed during the biodiversity assessment, species presence has been assumed in the unsurveyed areas of the Subject Land. The unsurveyed areas of the Subject Land are located in the SCES Facility Area only, there is no assumed presence in the transmission line component of the Project.

Presence has been assumed for the following candidate species credit species and require species polygons for this biodiversity assessment report:

- *Acacia notabilis* (Mallee Golden Wattle)
- *Acacia rivalis* (Creek Wattle)
- *Indigofera longibractea* (Showy Indigo)
- *Swainsona flavicarinata* (Yellow-Keeled Swainsona)
- *Swainsona murrayana* (Slender Darling Pea)
- *Swainsona viridis* (Creeping Darling Pea).

The details of the species polygons generated for each species are provided as follows.

5.5.1 *Acacia notabilis* (Mallee Golden Wattle)

This species is required in the TBDC to be assessed based on count of individuals present within the Subject Land. Given the very small area and low likelihood of occurrence, a single individual has been entered into the BAM calculator. Surveys are planned in spring 2023 to confirm whether this species occurs in the Subject Land that has not yet been subject to seasonal survey. The species polygon details are provided in **Table 5.8** and the species polygon is mapped in **Figure 5.3.**

Table 5.8 Mallee Golden Wattle Species Polygon Details

Information Required	Species Polygon Details
Biodiversity Risk Weighting	2
SAII Entity	No
Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Not applicable
Extent of suitable habitat present within the unsurveyed components of the Subject Land	PCT 136 = 0.02 PCT 155 = 0.20 Total = 0.21 ha
TBDC species specific recommendations	Nil.
Habitat condition (vegetation integrity score for each vegetation zone in the species polygon)	PCT 136 Good VI Score= 54.9 PCT 155 Good VI Score= 30.6

Legend

- Project Area
- Subject Land

Assumed Presence

- *Acacia notabilis*

FIGURE 5.3

Acacia notabilis (Mallee Golden Wattle) Species Polygon (Assumed Presence)

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

5.5.2 *Acacia rivalis* (Creek Wattle)

This species is required in the TBDC to be assessed based on count of individuals present within the Subject Land. Given the very small area and low likelihood of occurrence, a single individual has been entered into the BAM calculator. Surveys are planned in Spring 2023 to confirm whether this species occurs in the Subject Land that has not yet been subject to seasonal survey. The species polygon details are provided in **Table 5.9** and the species polygon is mapped in **Figure 5.4.**

Table 5.9 Creek Wattle Species Polygon Details

Information Required	Species Polygon Details
Biodiversity Risk Weighting	3
SAII Entity	Yes
Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Not applicable
Extent of suitable habitat present within the unsurveyed components of the Subject Land	PCT 136 = 0.01 ha
TBDC species specific recommendations	Nil.
Habitat condition (vegetation integrity score for each vegetation zone in the species polygon)	PCT 136 Good VI Score= 54.9

Legend

- Project Area
- Subject Land

Assumed Presence

- *Acacia rivalis*

FIGURE 5.4

Acacia rivalis **(Creek Wattle)**
Species Polygon (Assumed Presence)

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

5.5.3 *Indigofera longibractea* (Showy Indigo)

This species is required in the TBDC to be assessed based on area of suitable habitat present within the Subject Land. Within the unsurveyed components of the Subject Land this species is associated with PCT 136 and 155, the unsurveyed components of these PCTs have been used as the species polygon. The species polygon details are provided in **Table 5.10** and the species polygon is mapped in **Figure 5.5.**

Table 5.10 Showy Indigo Species Polygon Details

Information Required	Species Polygon Details
Biodiversity Risk Weighting	3
SAII Entity	Yes
Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Rocky creekbeds and drainage lines or within 100 m And Rocky hills, scarps, slopes and ridges or within 100 m
Extent of suitable habitat present within the unsurveyed components of the Subject Land	PCT 136 = 0.02 ha PCT 155 = 0.20 ha Total = 0.22 ha
TBDC species specific recommendations	Leaves are distinctive. Flowers June - October. Plants will die during drought, but may recover from seedbank
Habitat condition (vegetation integrity score for each vegetation zone in the species polygon)	PCT 136 Good VI Score = 54.9 PCT 155 Good VI Score = 30.6

Legend

- Project Area
- Subject Land

Assumed Presence

- *Indigofera longibractea*

FIGURE 5.5

Indigofera longibractea (Showy Indigo Species Polygon (Assumed Presence)

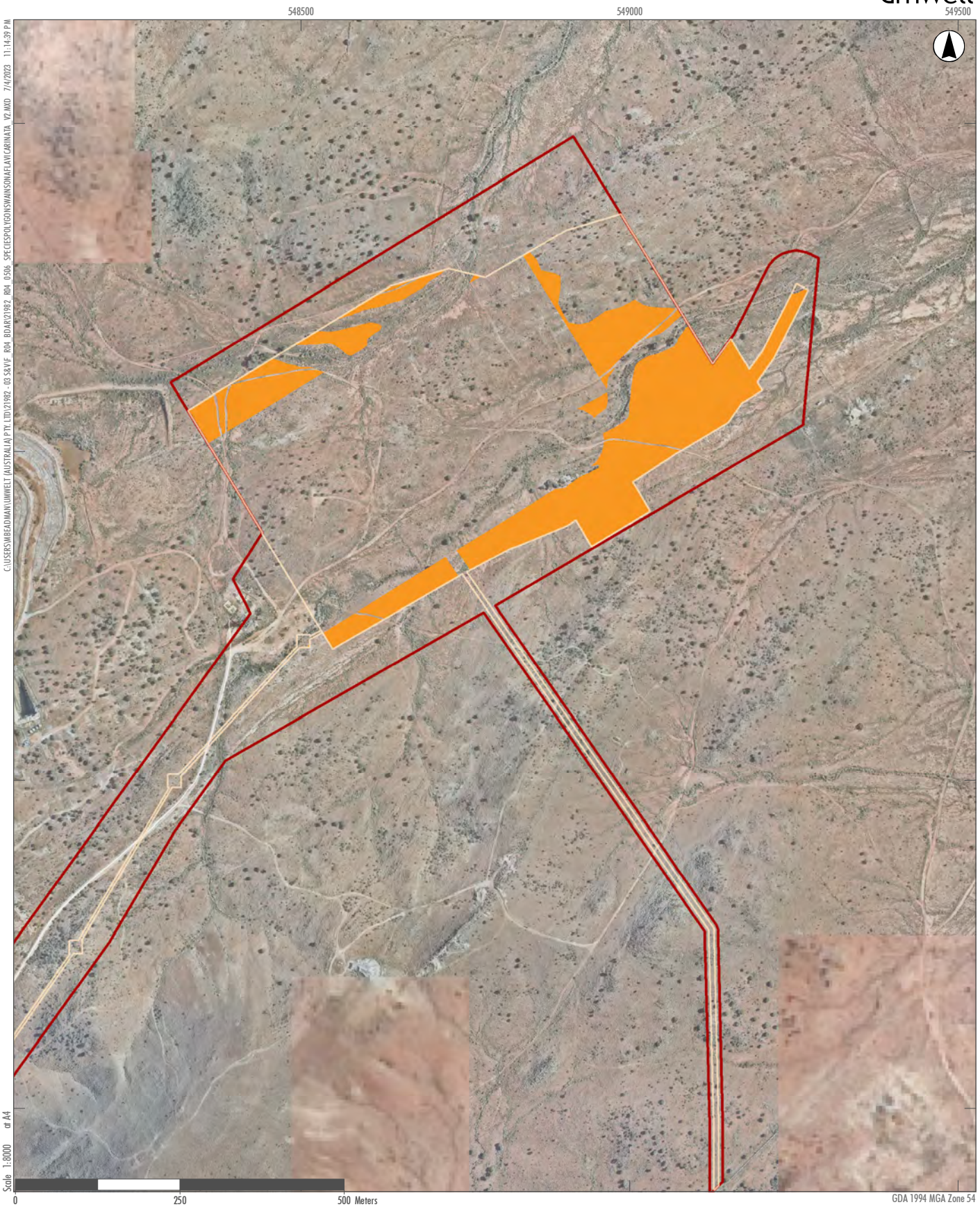
Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

5.5.4 *Swainsona flavicarinata* (Yellow-Keeled Swainsona)

This species is required in the TBDC to be assessed based on area of suitable habitat present within the Subject Land. Within the unsurveyed components of the Subject Land this species is associated with PCT 155 only and this PCT has been used as the species polygon (unsurveyed components only). The species polygon details are provided in **Table 5.11** and the species polygon is mapped in **Figure 5.6.**

Table 5.11 Yellow-Keeled Swainsona Species Polygon Details

Information Required	Species Polygon Details
Biodiversity Risk Weighting	3
SAII Entity	Yes
Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Not applicable
Extent of suitable habitat present within the unsurveyed components of the Subject Land	PCT 155 = 8.42 ha
TBDC species specific recommendations	Survey 4 to 7 weeks after above average rainfall to detect flowering. Erratic occurrence, dying back under dry conditions.
Habitat condition (vegetation integrity score for each vegetation zone in the species polygon)	PCT 155 Good VI Score= 30.6



Legend

- Project Area
- Subject Land

Assumed Presence

- *Swainsona flavicarinata*

FIGURE 5.6

Swainsona flavicarinata (Yellow-Keeled Swainsona) Species Polygon (Assumed Presence)

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

5.5.5 *Swainsona murrayana* (Slender Darling Pea)

This species is required in the TBDC to be assessed based on area of suitable habitat present within the Subject Land. Within the unsurveyed components of the Subject Land this species is associated with PCT 155 only and this PCT has been used as the species polygon (unsurveyed components only). The species polygon details are provided in **Table 5.12** and the species polygon is mapped in **Figure 5.7.**

Table 5.12 Slender Darling Pea Species Polygon Details

Information Required	Species Polygon Details
Biodiversity Risk Weighting	2
SAII Entity	No
Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Not applicable
Extent of suitable habitat present within the unsurveyed components of the Subject Land	PCT 155 = 8.42 ha
TBDC species specific recommendations	Nil.
Habitat condition (vegetation integrity score for each vegetation zone in the species polygon)	PCT 155 Good VI Score= 30.6

Legend

- Project Area
- Subject Land

Assumed Presence

- *Swainsona murrayana*

FIGURE 5.7

Swainsona murrayana (Slender Darling Pea)
Species Polygon (Assumed Presence)

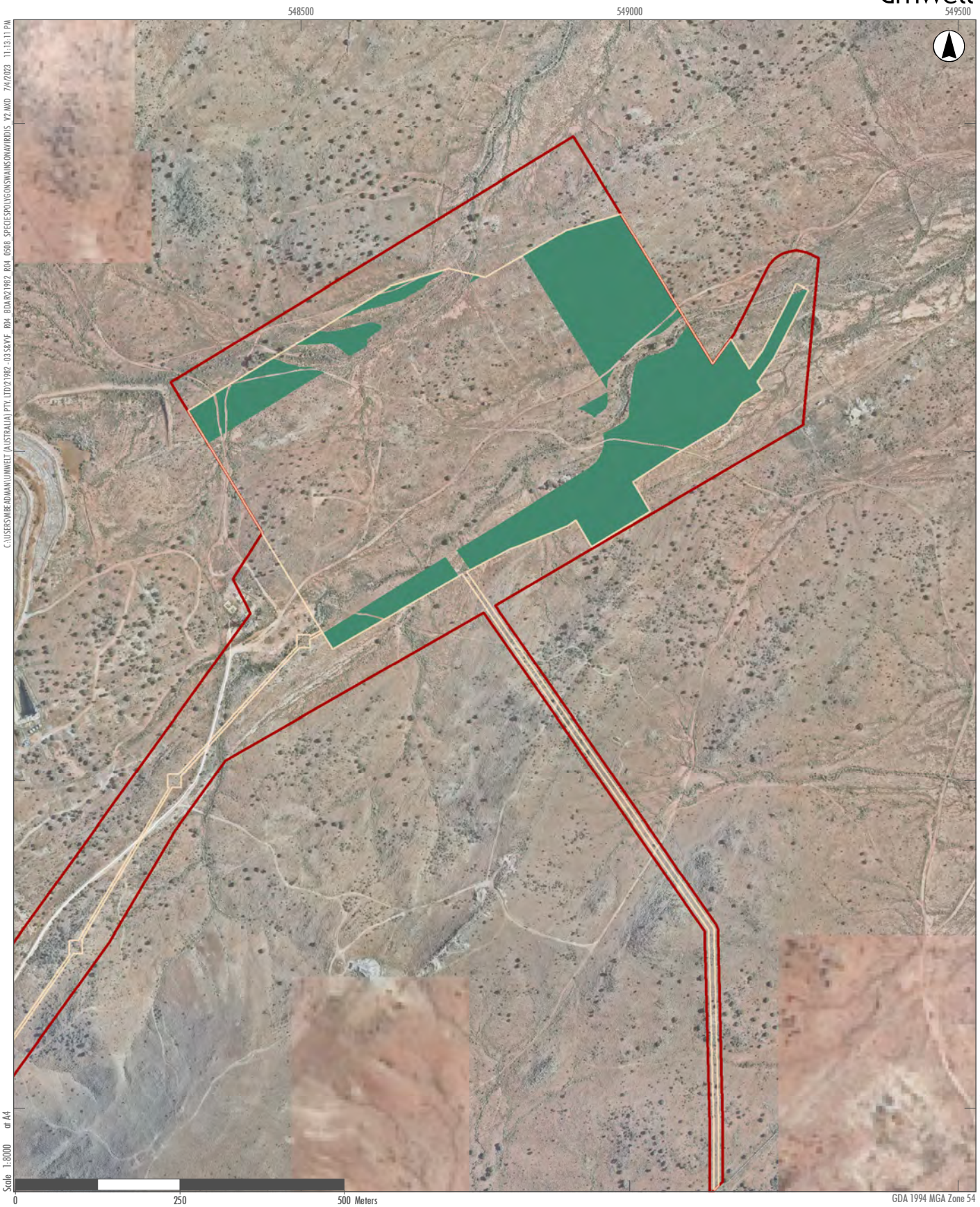
Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

5.5.6 *Swainsona viridis* (Creeping Darling Pea)

This species is required in the TBDC to be assessed based on area of suitable habitat present within the Subject Land. Within the unsurveyed components of the Subject Land this species is associated with PCT 136 and 155, the unsurveyed components of these PCTs have been used as the species polygon. The species polygon details are provided in **Table 5.13** and the species polygon is mapped in **Figure 5.8.**

Table 5.13 Creeping Darling Pea Species Polygon Details

Information Required	Species Polygon Details
Biodiversity Risk Weighting	3
SAII Entity	Yes
Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Not applicable
Extent of suitable habitat present within the unsurveyed components of the Subject Land	PCT 123 = 2.12 ha PCT 155 = 8.42 ha Total = 10.55 ha
TBDC species specific recommendations	Survey after average to wet seasonal conditions. Flowers mainly in Sep - Oct but will sporadically flower earlier or later with above average rainfall. Above ground components are not detectable in dry conditions.
Habitat condition (vegetation integrity score for each vegetation zone in the species polygon)	PCT 123 Good VI Score= 56.6 PCT 155 Good VI Score = 30.6



Legend

- Project Area
- Subject Land

Assumed Presence

- *Swainsona viridis*

FIGURE 5.8

Swainsona viridis (Creeping Darling Pea) Species Polygon (Assumed Presence)

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

6.0 Identifying Prescribed Impacts

Prescribed impacts are those that may affect biodiversity values in addition to, or instead of, impacts from clearing native vegetation. Clause 6.1 of the *BC Regulation* defines Prescribed Impacts as 'The impacts of development on the following habitat of threatened species or ecological communities:

- karst, caves, crevices, cliffs and other geological features of significance
- rocks
- human made structures
- non-native vegetation
- the impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range
- the impacts of development on movement of threatened species that maintains their lifecycle
- the impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and TECs (including from subsidence or upsidence resulting from underground mining or other development)
- the impacts of wind turbine strikes on protected animals
- the impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

Prescribed impacts which are predicted to occur as a result of the proposed development are documented in **Table 6.1**.

Table 6.1 Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
Example: Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐Yes / ☒No	N/A	N/A
Example: Vehicle strikes	☐Yes / ☒No	N/A	N/A
Human-made structures	☒Yes / ☐No	There is one old mine shaft located in the vicinity of the SCES facility. It has been confirmed that this will not be impacted as part of the proposed works.	Nil
Non-native vegetation	☒Yes / ☐No	Minor areas of non-native vegetation occur within the Subject Land.	Nil.

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
Habitat connectivity	☐Yes / ☒No	N/A	N/A
Waterbodies, water quality and hydrological processes	☒Yes / ☐No	The watercourses present within the Subject Land will be impacted by the Project, these are all ephemeral drainage lines given the location of the Subject Land within an arid region.	No threatened entities were observed using the watercourses present, however threatened fauna species may utilise these areas for nourishment.
Wind turbine strikes (wind farm development only)	☐Yes / ☒No	N/A	N/A
Vehicle strikes	☐Yes / ☒No	N/A	N/A

7.0 Avoid and Minimise Impacts

7.1 Avoid and Minimise Direct and Indirect Impacts

7.1.1 Project Location

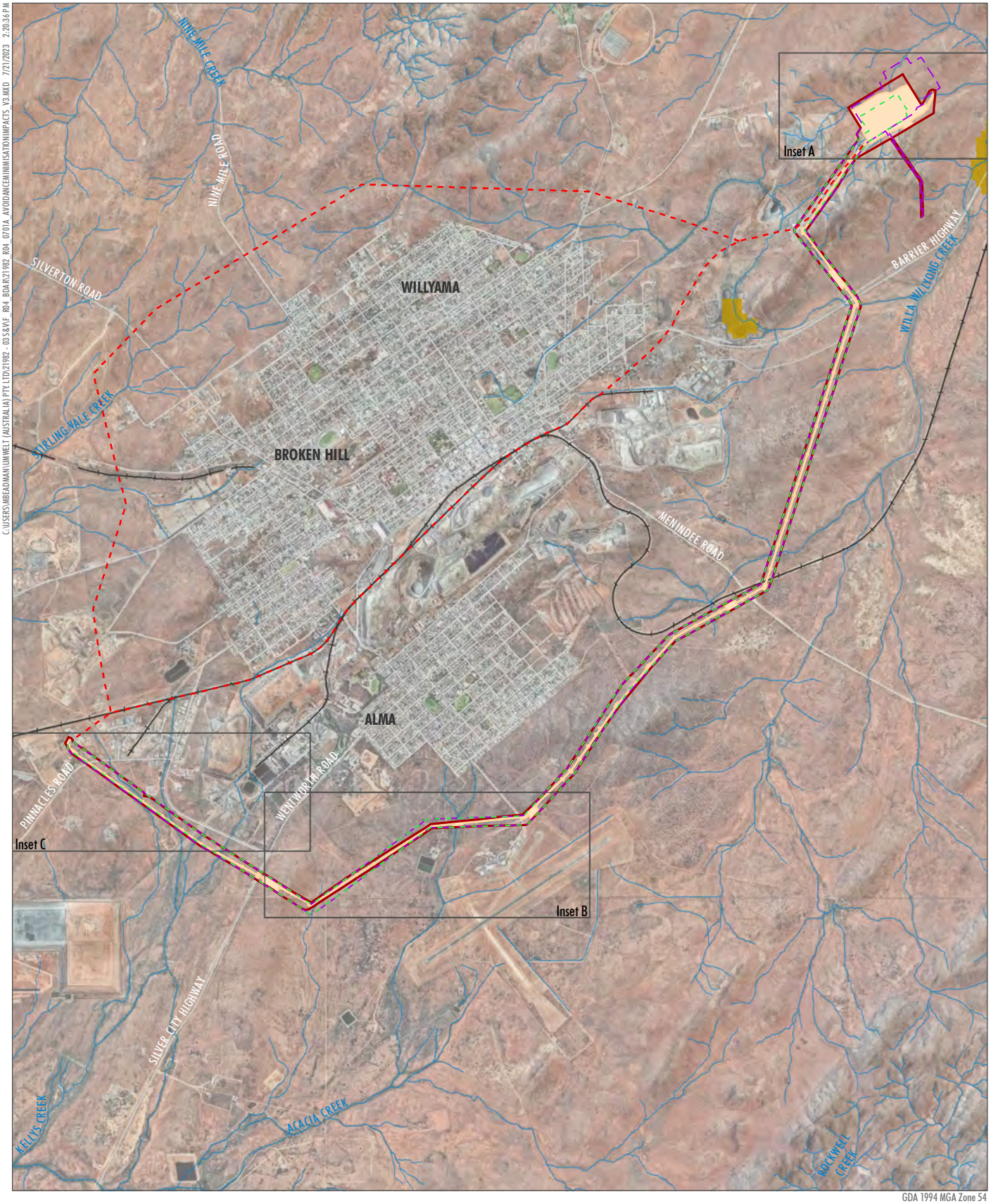
The Project is a direct response to reliability supply issues in Broken Hill identified by Transgrid through the RIT-T process and the preferred solution to address the current issues. The Project is proposed to replace the existing diesel-fired turbines and also enable greater renewable energy connection improving the economics of existing renewable energy facilities and encouraging future renewable energy projects. There is significant local and regional benefit associated with the Project and a defined local need for an energy storage solution.

The Potosi Mine site was selected as the proposed location due to favourable geological conditions, utilisation of existing mining areas and utilisation of existing mining infrastructure. It also provides a suitable buffer distance to other land uses including from the main residential area of Broken Hill. Two locations for the SCES Facility within the Potosi mine site were investigated. The proposed location is preferred due to being immediately above the deepest part of the Potosi Mine (Level 20/21) and close to the existing mine access shafts. The alternative site location considered was immediately west of the preferred site location.

Connection to the grid is required to the existing Transgrid substation located on the western side of Broken Hill. The proposed transmission line provides for connection to existing electricity infrastructure and has been designed to avoid and minimise impact as far as practicable, (refer to Section 2.8.2 of the EIS) for further detail. Three alignments were considered as part of the assessment. The proposed alignment was selected based on reduced land use conflict (including land subject to determined Native Title), impact to biodiversity values and separation from sensitive receivers including residential land use, tourism and historic heritage values (refer to **Figure 7.1**).

7.1.2 Project Design

The Project Area was assessed in its entirety following commencement of the biodiversity surveys. The assessment initially assumed complete disturbance of land within the Project Area. Umwelt worked with A-CAES NSW to reduce the size of the Subject Land Footprint, as can be seen in **Figure 7.1** the Subject Land is substantially smaller than any of the Project Area iterations. The Transmission Line is a monopole design which requires the least disturbance, the narrow tubular design reduces the materials and footing size required for construction in comparison to the tower design. The Transmission Line has an associated 50 m easement however vegetation removal will only occur within the proposed disturbance area associated with the Project and locations within the easement where vegetation is over 10 metres in height (comprising PCT 41 River Red Gum Open Woodland in condition zones high weed cover and planted, along with planted street trees), vegetation will either be removed or pruned depending on location. For the purposes of this assessment, it is assumed this vegetation will be removed to provide a worst-case assessment. These areas are included in the Subject Land.



GDA 1994 MGA Zone 54

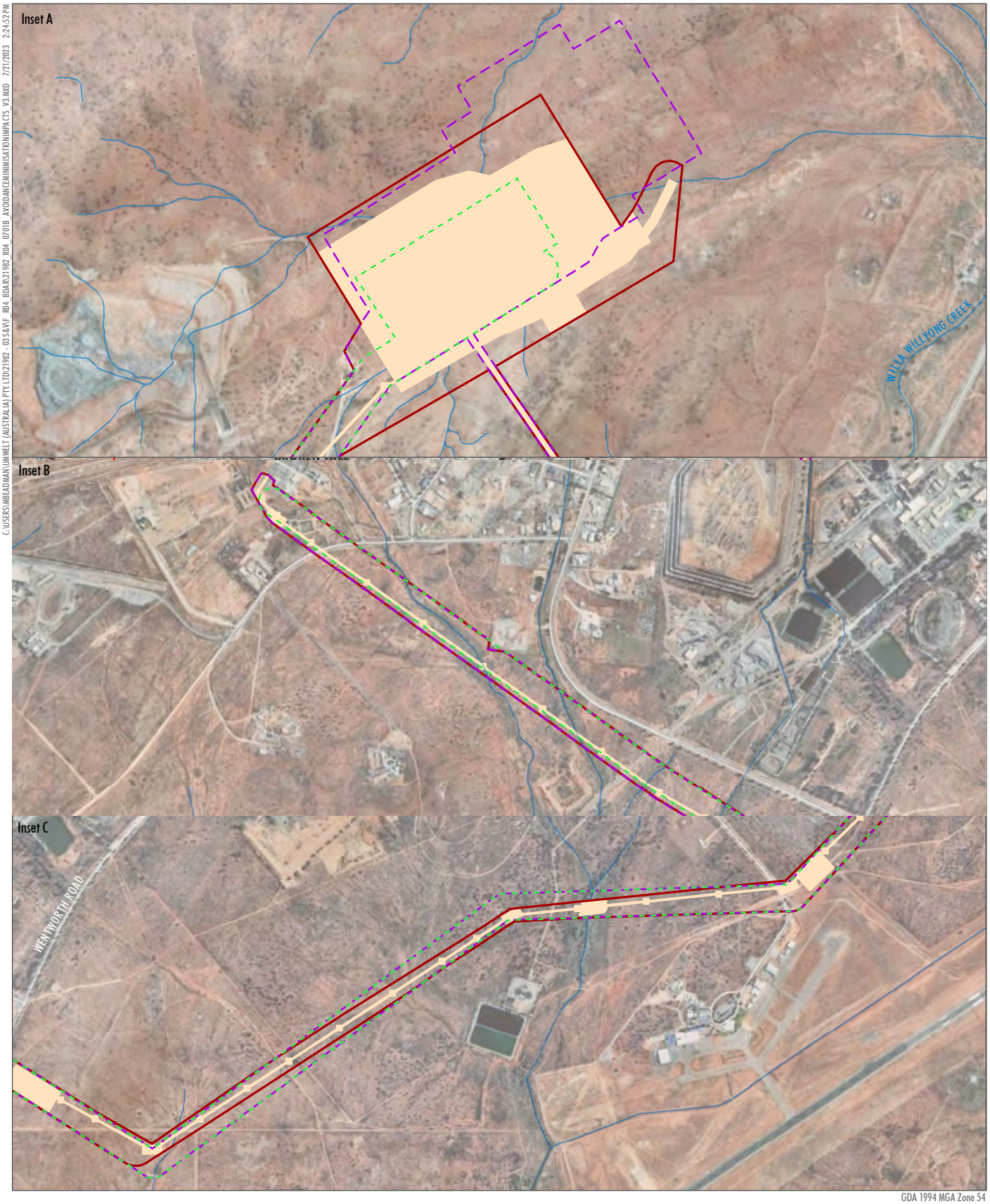
Legend

- Project Area
- Subject Land
- September 2022 Project Area
- February 2023 Project Area
- Alternative Transmission Line Corridors
- Floodplain Wetland
- Drainage Line
- Railway Line
- Road

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE 7.1A

Avoidance and Minimisation of Impacts



GDA 1994 MGA Zone 54

Legend

- Project Area
- Subject Land
- September 2022 Project Area
- February 2023 Project Area
- Alternative Transmission Line Corridors
- Drainage Line
- Railway Line
- Road

FIGURE 7.1B

Avoidance and Minimisation of Impacts

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

7.2 Avoid and Minimise Prescribed Impacts

Prescribed Impacts are additional impacts which require assessment; however, they are not impacts which require consideration when calculating the number and classes of biodiversity credits required. Clause 6.1 of the Biodiversity Conservation Regulation defines *Prescribed Impacts* as:

- The impacts of development on the following habitat of threatened species or ecological communities:
    - karst, caves, crevices, cliffs and other geological features of significance
    - rocks
    - human made structures
    - non-native vegetation
    - the impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range
    - the impacts of development on movement of threatened species that maintains their lifecycle
    - the impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development)
    - the impacts of wind turbine strikes on protected animals
    - the impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

Prescribed impacts for the Project are detailed in **Section 6.0**.

7.2.1 Project Location

Potential prescribed impacts of relevance to the Project are identified in **Section 6.0** of this Report and comprise disturbances to non-native vegetation, human made structures and waterbodies such as watercourses. Areas of non-native vegetation and human made structures are not likely to provide habitat of importance to threatened entities. Impacts to waterbodies is discussed further in **Appendix D** Aquatic Assessment. The Project is not expected to result in adverse surface water impacts or in the downstream environments of the Project Area. The Transmission Line component and pole pads within the Project Area will not impact waterways, but powerlines will 'straddle' waterways within the Project Area.

7.2.2 Project Design

Potential prescribed impacts of relevance to the Project are identified in **Section 6.0** of this Report and comprise disturbances to non-native vegetation, human made structures and waterbodies such as watercourses. Areas of non-native vegetation and human made structures are not likely to provide habitat of importance to threatened entities.

As discussed above, the Potosi Mine site was selected as the proposed location due to favourable geological conditions, utilisation of existing mining areas and utilisation of existing mining infrastructure.

7.3 Other Measures Considered

7.3.1 Do Nothing Option

The 'Do nothing' option was considered as part of environmental impact assessment for the Project.

This option would imply that the Project is not developed and would therefore forgo the Project's identified benefits. Significant social and economic benefits will be created through capital investment and provision of direct and indirect employment opportunities during the construction and operation of the Project. The 'do-nothing option' also results in a lost opportunity for a diversified post-mining land use for the Potosi Mine.

The 'do nothing option' would avoid the environmental and social impacts associated with the construction, operation and decommissioning of the Project, such as biodiversity and Aboriginal Archaeology impacts, and social amenity impacts (noise and traffic). However, these impacts are considered to be manageable through the implementation of the management and mitigation measures outlined in the EIS.

The Proponent has proceeded with the Project as a direct response to reliability supply issues in Broken Hill and as the preferred option identified by Transgrid. Irrespective, Transgrid will still be obliged to implement a solution to the reliability supply issues in Broken Hill. Under the 'do-nothing option' for this Project, a sub-optimal action would need to be implemented by Transgrid.

7.4 Summary of Measures to Avoid and Minimise Impacts

A summary of the measures proposed to avoid and minimise direct, indirect and prescribed impacts associated with the Project is provided in **Table 7.1**.

Table 7.1 Avoidance and minimisation measures for direct, indirect and prescribed impacts.

Action	Outcome	Timing	Responsibility
Preliminary biodiversity constraints analysis	Preliminary assessment of biodiversity constraints to inform Project design and support proponent to adjust design to minimise impacts to areas with high biodiversity values	Project design	Project Ecologist, Planning Team and Proponent
Reduction of Subject Land boundary / Subject Land	Avoidance and minimisation of impacts to remnant native vegetation though detailed design of the transmission line impacts and only clearing what is necessary. The Subject Land was reduced from the entire 50 m easement to the reduced Subject Land.	Project design	Project Ecologist, Planning Team and Proponent

Action	Outcome	Timing	Responsibility
Workforce education and training	Environmental awareness for workforce	Pre-construction and during construction and operation	Site Manager
Implement Construction Environmental Management Plan	Management and minimisation of potential environmental impacts	Project construction	Site Manager
Implementation of vegetation protection zones for areas to be retained	Protect retained habitats	During construction phase	Project Ecologist and Site Manager
Ecologist pre-clearance surveys and supervision of works	Minimisation of impacts to local fauna and their habitats through identification of fauna present and management to minimise harm	Construction / site clearing phase	Project Ecologist and Site Manager
Fencing and access control	Avoidance of unplanned human and livestock interference and disturbance to retained areas	Construction and operational phases	Site Manager
Erosion and sedimentation control	Minimise erosion and sedimentation within the site and downstream habitats through installation and maintenance of erosion and sediment controls	Construction and operational phases	Site Manager
Weed management	Prevent weed incursions and spread	During construction, site clearing and operational phases	Site Manager
Fauna exclusion	Prevent entrapment of fauna within site infrastructure	Operational phase	Site Manager and project ecologist

8.0 Impact Assessment

8.1 Direct Impacts

The following subsections document the residual impacts of the Project following the application of the avoidance and minimisation measures discussed in **Section 7.0**. The parts of the Subject Land which are subject to impacts associated with the Project are mapped on **Figure 8.1**.

Whilst A-CAES NSW is committed to undertaking all relevant survey to determine presence /absence of all species-credit species across the Subject Land, late changes to the Subject Land have resulted in some minor areas where surveys have not been completed and the requirement to assume presence for select species-credit species. Targeted surveys for species-credit species that have been assumed present are proposed for survey later in spring 2023 prior to the determination of the development application of the Project.

It is important to also note that, for any areas identified for disturbance within the Transmission Line, partial impacts have not been considered. Instead, full clearing has been assessed within the disturbance area associated with the Transmission Line. Outside of the disturbance area (but within the associated easement – 50 m) vegetation pruning will occur where vegetation has been identified as over 10 m in height (or with the ability to grow over 10 m in height), these areas have been included in the subject land and full disturbance has been assumed.

8.1.1 Residual Direct Impacts

As discussed in **Section 7.0** over the course of the biodiversity assessment the proponent has substantially reduced the proposed area of impacts from the wider easement and SCES Facility (approximately 108.32 ha) to the current boundary of the Subject Land (47.61 ha). As such the Subject Land, as displayed throughout this BDAR, represents the areas of residual direct impact. **Table 8.1** and **Table 8.2 s**ummarise the extent of proposed residual direct impacts to plant community types and threatened entities observed or assumed to be present on the Subject Land.

The Project will result in direct impacts on biodiversity values. Direct impacts include the loss of native vegetation and fauna habitat as a result of clearance works for the SCES facility and Transmission Line construction. As discussed in **Section 7.0** the proponent has worked to reduce the area of vegetation clearing required for the construction of the Transmission Line.

Table 8.1 Summary of residual direct impacts for the standard development - SCES Facility

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	BC Act status	EPBC Act status	Potential SAII entity	Project phase/timing of impact	Extent
123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion	-	-	No	Construction Phase	**Condition zones:** **Good** = 5.21 ha **Total extent** = 5.21 ha
136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone	-	-	No	Construction Phase	**Condition zones:** **Good** = 3.45 ha **Total extent** = 3.45 ha
155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones	-	-	No	Construction Phase	**Condition zones:** **Good** = 22.4 ha Total extent = 22.4 ha
Mallee Golden Wattle (*Acacia notabilis)*	Endangered	-	No	Assumed present due to lack of surveys (not predicted to be impacted during Project)	**Species polygon** = 1 individual (assumed present)
Creek Wattle (*Acacia rivalis*)	Endangered	-	Yes	Assumed present due to lack of surveys (not predicted to be impacted during Project	**Species polygon** = 1 individual (assumed present)
Showy Indigo *(Indigofera longibractea*)	Endangered	-	Yes	Assumed present due to lack of surveys (not predicted to be impacted during Project	**Species polygon** = 0.22 ha
Yellow-Keeled Swainsona (*Swainsona flavicarinata*)	Endangered	-	Yes	Assumed present due to lack of surveys (not predicted to be impacted during Project	**Species polygon** = 8.42 ha
Slender Darling Pea (*Swainsona murrayana)*	Vulnerable	Vulnerable	No	Assumed present due to lack of surveys (not predicted to be impacted during Project	**Species polygon** = 8.42 ha
Creeping Darling Pea (*Swainsona viridis*)	Endangered	-	Yes	Assumed present due to lack of surveys (not predicted to be impacted during Project	**Species polygon** = 10.5 ha

Table 8.2 Summary of residual direct impacts - Transmission line

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	BC Act status	EPBC Act status	Potential SAII entity	Project phase/timing of impact	Extent
41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone	-	-	No	Construction Phase	**Condition zones:** **Derived Shrubland** = 0.05 ha **High Weed Cover** = 0.47 ha **Planted** = 0.11 ha **Total extent** = 0.62 ha
123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion	-	-	No	Construction Phase	**Condition zones:** **Dieback** = 0.22 ha **Good** = 3.92 ha **Total extent** = 4.14 ha
136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone	-	-	No	Construction Phase	**Condition zones:** **Disturbed- High Weed Cover** = 0.11 ha **Good** = 0.09 ha **Total extent** = 0.2 ha
150 Bottlewasher - Copperburr grassland of the arid zone	-	-	No	Construction Phase	**Condition zones:** **Good** = 1.05 ha **Total extent** = 1.05 ha
155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones	-	-	No	Construction Phase	**Condition zones:** **Disturbed** = 0.87 ha **Good** = 7.77 ha **Total extent** = 8.64
158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)	-	-	No	Construction Phase	**Condition zones:** **Good** = 0.38 ha **Total extent** = 0.38 ha

8.1.2 Changes in Vegetation Integrity Score

For each vegetation zone the change in vegetation integrity is based on the development impacting to zero during construction (**Table 8.3, Table 8.4**). There are no vegetation integrity scores above zero after development and there would be no management actions required to maintain any remaining vegetation as it has been assumed that impact will occur to all vegetation within the vegetation zones.

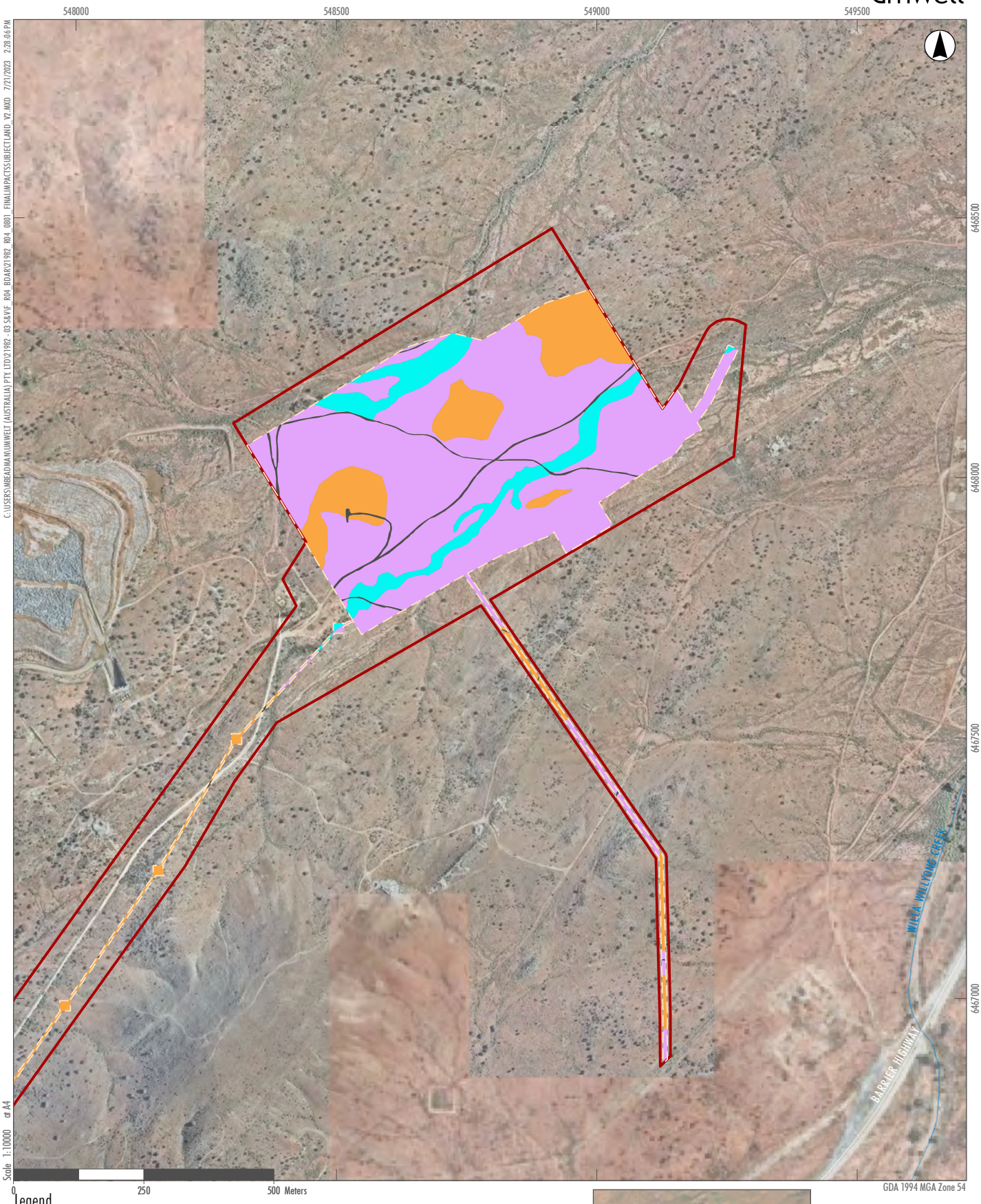
Table 8.3 Impacts to Vegetation Integrity Score - SCES Facility

PCT and Vegetation Condition Zone	Management zone	Area (ha)	Before development				After development				Change in VI score
			Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	
5 - 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion Good	Subject Land	5.21	75.5	42.5	-	56.6	0	0	0	0	-56.6
7 - 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone Good	Subject Land	3.45	3.45	32	-	54.9	0	0	0	0	-54.9
10 - 155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones Good	Subject Land	22.4	69.1	13.6	-	30.6	0	0	0	0	-30.6

Table 8.4 Impacts to Vegetation Integrity Score – Transmission Line

PCT and Vegetation Condition Zone	Management zone	Area (ha)	Before development				After development				Change in VI score
			Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	
1 - 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone Derived Shrubland	Subject Land	0.05	93	53.4	28.1	51.8	0	0	0	0	-51.8
2 - 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone High Weed Cover	Subject Land	0.47	25.4	58	65	45.7	0	0	0	0	-45.7
3 - 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone Planted	Subject Land	0.11	56.9	66.2	27.8	47.9	0	0	0	0	-47.9
4 - 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion Dieback	Subject Land	0.22	78.3	12.2	-	30.9	0	0	0	0	-30.9
5 - 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion Good	Subject Land	3.92	87.2	23	-	44.8	0	0	0	0	-44.8
6 - 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone Disturbed	Subject Land	0.11	76.6	27.1	-	45.6	0	0	0	0	-45.6
7 - 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone Good	Subject Land	0.09	96.7	30.9	-	54.6	0	0	0	0	-54.6
8 - 150 Bottlewasher - Copperburr grassland of the arid zone Good	Subject Land	1.05	91.1	11.5	-	32.3	0	0	0	0	-32.3

PCT and Vegetation Condition Zone	Management zone	Area (ha)	Before development				After development				Change in VI score
			Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	
9 - 155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones Disturbed	Subject Land	0.87	81.7	18.3	-	38.7	0	0	0	0	-38.7
10 - 155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones Good	Subject Land	7.77	86.8	77.5	-	82.0	0	0	0	0	-82.0
11 - 158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) Good	Subject Land	0.38	96.5	31.8	-	55.4	0	0	0	0	-55.4



Legend

- Project Area
- Subject Land

Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

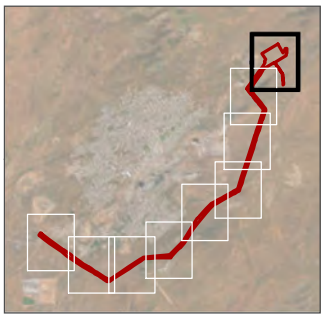


FIGURE 8.1A

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

Legend

- Project Area
- Subject Land

Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Planted
- Cleared

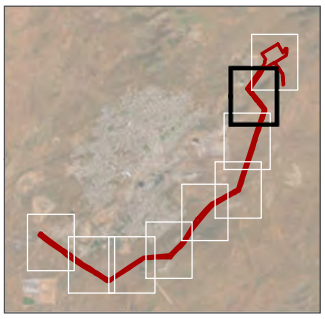
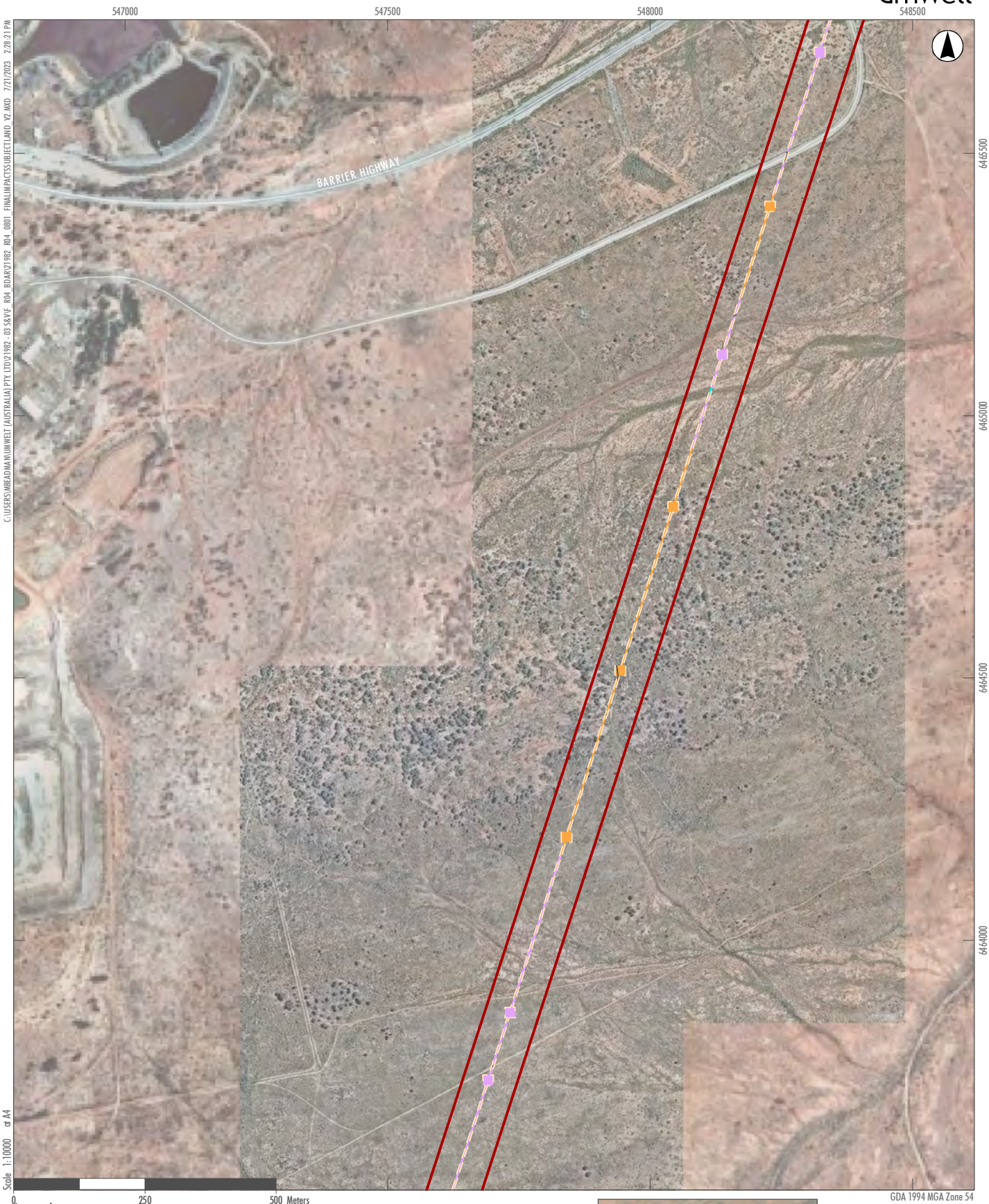


FIGURE 8.1B

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)



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Scale 1: 10000 at A4

umwelt

Legend

- Project Area
- Subject Land

Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

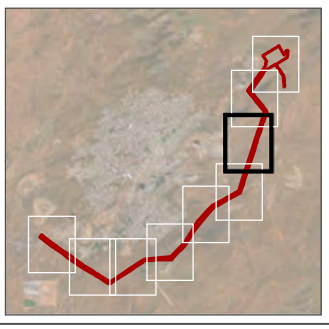


FIGURE 8.1C

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

Legend

- Project Area
- Subject Land

Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Dieback
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

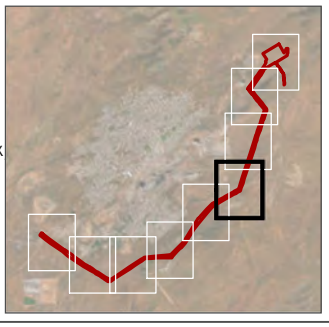


FIGURE 8.1D

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

Legend

- Project Area
- Subject Land

Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

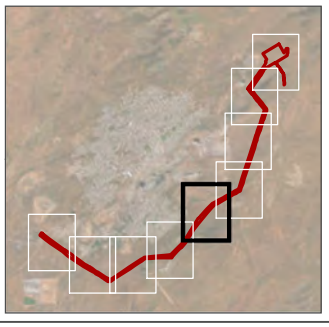


FIGURE 8.1E

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

Legend

- Project Area
- Subject Land

Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

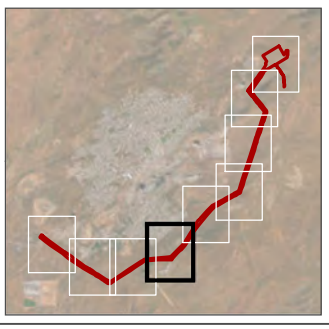


FIGURE 8.1F

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

Legend

- Project Area
- Subject Land

Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

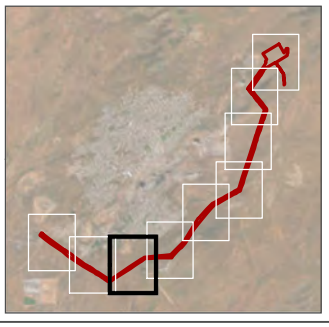


FIGURE 8.1G

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

Legend

- Project Area
- Subject Land

Plant Community Type

- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Derived Shrubland
- Cleared
- Planted Street Trees

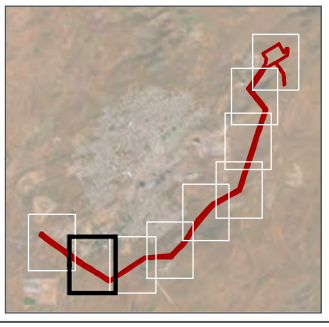


FIGURE 8.1H

Final Impacts Likely to Occur on the Subject Land

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

Legend

- Project Area
- Subject Land

Plant Community Type

- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Disturbed - High Weed Cover
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- Cleared

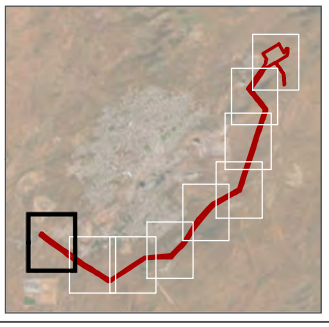


Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

FIGURE 8.1I

Final Impacts Likely to Occur on the Subject Land

8.2 Indirect Impacts

Table 8.5 summarises the extent of the proposed residual indirect impacts to plant community types and threatened entities observed or assumed to be present within the Subject Land.

Table 8.5 Summary of Residual Indirect Impacts.

Indirect impact	Threatened Entity Impacted	Project Impact Intensity	Frequency / Duration	Project phase/ timing of impact	Likelihood and consequences
Connectivity and corridors	Ecosystem credit species retained for assessment in **Table 5.1** and species credit threatened fauna species assessed as present in **Table 5.5.**	Low	Frequent / Ongoing	Operation	Will occur, consequences include reduced wildlife connectivity. Wildlife connectivity will be maintained through retention of suitable corridor areas.
Light spill impacts	Ecosystem credit species retained for assessment in **Table 5.1** and species credit threatened fauna species assessed as present in **Table 5.5.**	Low	Frequent/ Ongoing	Operation	Will occur, consequences likely to include minor alteration to fauna behaviours including avoidance of light and opportunistic utilisation of light spill areas. To be minimised by appropriate lighting controls in design including designing operational lighting consistent with relevant Australian Standards.
Noise impacts	Ecosystem credit species retained for assessment in **Table 5.1** and species credit threatened fauna species assessed as present in **Table 5.5.**	Low	Frequent / short term	Construction and Operation	Will occur, consequences likely to include short term reduction in suitability of retained and adjoining habitats during construction works for sensitive fauna species. A construction noise management plan is proposed to guide the minimisation of noise impacts during construction. Noise controls included in design to minimise noise impacts in operation.
Air quality impacts	Ecosystem credit species retained for assessment in **Table 5.1** and species credit threatened fauna species assessed as present in **Table 5.5**	Low	Infrequent / short term	Construction	Low potential to occur if appropriate dust suppression is undertaken as is proposed by the proponent. Consequences include physical injury to airways of fauna species and short term reduced photosynthetic capacity for impacted flora.
Water impacts	Ecosystem credit species retained for assessment in **Table 5.1** and species credit threatened fauna species assessed as present in **Table 5.5**	Moderate in short term low in long term	Infrequent / long term	Construction and operation	Diversion of an existing ephemeral creek in the SCES Facility. Watercourses in the Transmission Line will be straddled by wires and poles. Downstream impacts are considered to be negligible.

Indirect impact	Threatened Entity Impacted	Project Impact Intensity	Frequency / Duration	Project phase/ timing of impact	Likelihood and consequences
Weed invasion	E Ecosystem credit species retained for assessment in **Table 5.1** and species credit threatened fauna species assessed as present in **Table 5.5.**	Low	Frequent / long term	Construction and operation	Consequences include introductions of new weeds, however, appropriate controls will be put in place to address this risk.
Pest animal species	Ecosystem credit species retained for assessment in **Table 5.1** and species credit threatened fauna species assessed as present in **Table 5.5.**	Low	Frequent / long term	Construction and operation	Likely already occurring due to historical habitat modification. Low potential for increased impacts, consequences include reduced habitat suitability and predation of threatened fauna species.

8.3 Prescribed Impacts

Prescribed impacts associated with the Project are identified in **Section 6.0** of this report and are further documented below.

8.3.1 Karst, Caves, Crevices, Cliffs, Rocks or Other Geological Features of Significance

8.3.1.1 Nature and Extent

The Project will not impact caves, crevices, cliffs or geological features of significance.

Impacts are likely to occur to minor areas of rock outcropping which have been surveyed for candidate threatened species. These impacts are likely to be long-term and permanent.

8.3.1.2 Duration

This is likely to be one-off, permanent impact for the life of the Project which will occur during construction.

8.3.1.3 Consequences

No threatened species have been recorded utilising these habitats and no significant consequences are predicted to occur.

8.3.2 Human Made Structures

8.3.2.1 Nature and Extent

A mine shaft is located in proximity to the SCES Facility, within the Subject land. It will not be impacted by the proposed works. There are currently two active portals providing access to the underground workings, the Potosi Mine Portal (located within the Potosi Pit) and the Silver Peak Portal. These two portals provide access to the existing underground mining areas at the proposed cavern depth (600 m BGL). The existing portals and workings will be utilised to construct the cavern, once construction is complete access to the cavern would no longer be required and use and/or rehabilitation of the portals would be undertaken by Perilya and does not form part of this Project.

8.3.2.2 Duration

The mine shaft will not be impacted, there will be no duration of impacts.

8.3.2.3 Consequences

As the mine shaft will not be impacted by the proposed works, there will be no consequences predicted to occur.

8.3.3 Non-Native Vegetation

8.3.3.1 Nature and Extent

Minor areas of non-native vegetation occur within the Subject Land, these areas are associated with previous mining activities.

8.3.3.2 Duration

This will be a one-off, permanent impact for the life of the Project that will occur during construction and site clearing.

8.3.3.3 Consequences

No threatened species have been observed in these habitats and no significant consequences are predicted to occur.

8.3.4 Habitat Connectivity

8.3.4.1 Nature and Extent

The Project is unlikely to affect habitat connectivity for flora and fauna species (refer to **Figure 1.1** and **Figure 1.2**). The Subject land is located adjacent to the town of Broken Hill. The landscape surrounding Broken Hill comprises large areas of native arid vegetation. The Transmission Line component of the Project has been designed to minimise the amount of native vegetation that will be cleared. Native flora and fauna will still be able to utilise undisturbed areas of land underneath the Transmission Line and the transmission line and access track are not considered a barrier to fauna movement. The areas of clearing primarily consist of native vegetation however due to the location of the Subject Land relative to Broken Hill and the wider landscape it is unlikely that habitat connectivity will be impacted by the development.

8.3.4.2 Duration

This will be a one-off, permanent impact for the life of the Project that will occur during construction and site operation.

8.3.4.3 Consequences

No long term, significant impacts to habitat connectivity are predicted to occur as part of the Project.

8.3.5 Waterbodies, Water Quality and Hydrological Processes

8.3.5.1 Nature and Extent

The watercourses present within the Subject Land will be impacted by the Project, these are mostly ephemeral drainage lines and one permanent creek line. One ephemeral creek line within the SCES facility will be diverted as part of the Project. An aquatic ecology assessment is presented in **Appendix D**.

8.3.5.2 Duration

This will be a one-off, permanent impact for the life of the Project that will occur during construction and site operation.

8.3.5.3 Consequences

The impacts to waterbodies and watercourses include reduced availability of habitat for aquatic species, altered hydrology and increased erosion and sedimentation of downstream environments. These impacts are considered to be negligible.

8.3.6 Vehicle Strikes

8.3.6.1 Nature and Extent

The Project includes the construction of several access roads through the site which will be utilised in the day-to-day operation of the Project. Vehicles driven through the site will adhere to appropriate speed limits to minimise impacts associated with vehicle strikes. It is noted that during the operational phase of the Project traffic generation will be relatively minimal, associated with staff entering and leaving the site along with deliveries, maintenance and similar traffic.

8.3.6.2 Duration

There will be an ongoing potential, however low probability of this impact occurring for the life of the Project.

8.3.6.3 Consequences

There is no reasonable probability that threatened entities will be impacted by vehicle strikes as vehicle movements will be at low speed.

8.4 Mitigating Residual Impacts – Management Measure and Implementation

The following management measures are proposed to mitigate the residual impacts (direct, indirect and prescribed) associated with the Project (both the SCES Facility and Transmission Line). The impact mitigation measures proposed for residual impacts are also further summarised in **Table 8.4,** with implementation details provided in **Table 8.5**.

Table 8.6 Summary of proposed mitigation and management measures for residual impacts (direct, indirect, and prescribed)

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy
Workforce education and training	Environmental awareness for construction and operational site workers	Construction and operation	For all new contractors and employees as part of the general site induction	Site Manager	Measure is likely to achieve intended outcome
Implementation of vegetation protection zones for areas to be retained	Temporary delineation of the Subject Land until permanent fencing is installed. Permanent fencing to be installed around the SCES Facility only, with the transmission line to be unfenced.	Construction / site clearing	Prior to and during site clearing and construction. Permanent fencing to remain for the life of the development	Site Manager and Project Ecologist	Measure is likely to achieve intended outcome
Ecologist pre-clearance surveys and supervision of works	Minimisation of impacts to local fauna and their habitats through identification of fauna present and management to minimise harm. Relocation of rock piles	Minimisation of impacts to local fauna and their habitats through identification of fauna present and management to minimise harm.	Prior to and during site clearing	Site Manager and Project Ecologist	Measure is likely to achieve intended outcome
Erosion and sedimentation control	Installation and maintenance of appropriate erosion and sediment controls and work practices.	Prior to and during civil works until permanent controls such as sediment basins are installed and established.	Temporary erosion and sediment controls would be installed prior to commencement of construction and permanent measures such as stormwater management infrastructure would be maintained for the life of the development.	Site Manager	Measure is likely to achieve intended outcome
Weed management	Targeted weed management works as required to suppress weed invasion	All stages of the development	As needed	Site Manager / Project Ecologist	Measure is likely to achieve intended outcome

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy
Fencing, Access Control and Fauna exclusion	Installation of a permanent non-barbed security fence around the SCES Facility.	During operation	For the life of the development	Site Manager	Measure is likely to achieve intended outcome
Preparation and Implement of Construction Environmental Management Plan	Develop plan to adequately manage environmental impacts during construction including, fencing and access control, weed management and erosion and sediment control.	To be prepared prior to the commencement of works and implemented for all construction works and for the life of the development as necessary	For the life of the development	Proponent / Site Manager	Measure is likely to achieve intended outcome

Table 8.7 Implementation details for proposed impact mitigation and management measures

Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Workforce education and training	Completion and maintenance of a site induction register	Induction of all construction workers	Failure of Site manager to implement program to induct workers	Breach to be reported in annual compliance reporting Suspension of the relevant works that could impact on biodiversity until construction workers are inducted
Implementation of vegetation protection zones for areas to be retained	Inspections to be undertaken by the Project Ecologist prior to commencement and monthly during construction works.	Protection of retained vegetation and habitats	Breach of vegetation protection zones / damaged to retained habitats	Breach to be reported in annual compliance reporting Suspension of the relevant works that could impact on biodiversity until appropriate protection measures are implemented and appropriate remedial actions to remedy any adverse impacts are completed.
Ecologist pre-clearance surveys and supervision of works	Reporting on preclearance surveys and works supervision to be undertaken by Project Ecologist	Completion of proposed works	Completion of clearing works without project ecologist supervision	Breaches to be reported in annual compliance reporting to DPE
Erosion and sedimentation control	Monitoring to be undertaken in accordance with requirements of Construction Environmental Management Plan.	Temporary erosion and sediment controls to be installed prior to works. Permanent controls to be maintained for the life of the development	Monitoring detects lack or failure of required temporary or permanent erosion and sediment controls.	Breaches to be reported in annual compliance reporting to DPE
Weed management	Monitoring to be undertaken in accordance with requirements of Construction Environmental Management Plan.	Weed growth to be continually suppressed within the Subject Land area	Monitoring detects increasing weed infestations which are not being suppressed.	Alternative methods or herbicides to be used to achieve success.
Fencing, Access Control and Fauna exclusion	Inspections to be undertaken in accordance with requirements of Construction Environmental Management Plan.	Exclusion of all target fauna species.	Repair or upgrade to fencing.	Fencing design to be improved to achieve effectiveness.

Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Preparation and Implement of Construction Environmental Management Plan	Implementation to be supervised by suitable environmental specialist.	Completion of all proposed environmental protection works and monitoring inspections	Monitoring detects breach or failure to implement Construction Environmental Management Plan.	Breach to be included in annual compliance reporting to DPE.

8.5 Adaptive Management Strategy for Uncertain Impacts (Where Relevant)

It is considered that the potential impacts associated with the Project are predictable and known. Adaptive strategies for impact mitigation measures are provided in **Table 8.7**. Further adaptive management strategies will be provided in the Construction Environmental Management Plan for the Project as it is during construction phase that the majority of impacts (e.g., clearing) will occur.

8.6 Impacts to Matters of National Environmental Significance

A referral was submitted to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 27 February 2023 and was determined to not be a controlled action (EPBC 2022/09415) on 20 June 2023. The referral considered the Project is unlikely to result in a significant impact to Matters of National Environmental Significance (MNES) listed threatened species, migratory species or threatened ecological communities (TECs) (Umwelt 2023) and this finding was confirmed when the Project was determined to not be a controlled action.

As the Project is not a Controlled Action under Section 75 of the EPBC Act, MNES have not, beyond that required by a BDAR, been further assessed in this report.

8.7 Aquatic Impacts

Aquatic habitats within the Subject Land consist of several un-named, ephemeral drainage lines that are degraded as a result of historical and current land management practices. The potential impacts on water quality are anticipated to be limited, given the nature and scale of the construction works and the low quality of aquatic habits. As noted above, the Project Area occurs in an arid region with low rainfall and therefore the aquatic habitats in the Project Area are ephemeral.

A section of one third order ephemeral creek line will be diverted as part of the Project. There are no significant impacts predicted for this creek diversion. **Appendix D** details the aquatic assessment.

Standard environmental management measures will be implemented and are expected to sufficiently manage any impacts. Water and erosion management controls will be employed to minimise erosion and discharge of sediment and other pollutants during construction.

Regional scale groundwater dependent ecosystem (GDE) mapping (BoM, 2022) indicates there are moderate to high aquatic and terrestrial GDEs within 10 kms of the Project Area (refer to the Groundwater Impact Assessment of the Environmental Impact Statement) but none are mapped within the Project Area. The mapped PCTs do not correspond with the mapped locations of the potential GDEs from the BoM GDE Atlas. It is noted that river red gums can have a degree of groundwater dependence. Within the Project Area PCT 41 contains river red gums that will be impacted by the Transmission Line, however given that the impacts to this PCT will be limited to minor clearing (pruning), negligible impacts to this potential GDE will occur.

9.0 Serious and Irreversible Impacts

9.1 Assessment for Serious and Irreversible Impacts on Biodiversity Values

The determination of a serious and irreversible impact on biodiversity values is to be made by the decision maker in accordance with the principles set out in the BC Regulation 2017. Under Clause 6.7 (2) of the BC Regulation 2017, an impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because of one of the following four principles:

- **Principle 1**: The impact will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or
- **Principle 2**: the impact it will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or
- **Principle 3**: it is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or
- **Principle 4**: the impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

Five candidate species-credit species identified by the BAM calculator for the Project are also listed as serious and irreversible impact (SAII) entities in the Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact (OEH 2017). These are:

- Creek Wattle (*Acacia rivalis*)
- *Convolvulus tedmoorei*
- Showy Indigo (*Indigofera longibractea*)
- Yellow-Keeled Swainsona (*Swainsona flavicarinata*)
- Creeping Darling Pea (*Swainsona viridis*).

Whilst these species are identified by the BAMC, further consideration of their potential presence on site is required and **Table 9.1** details the assessment process for the identified SAII species.

Table 9.1 Serious and Irreversible Impacts Assessment

Species	SAII	Habitat Constraint	Likelihood of Occurrence	Further Assessment Required?
Acacia rivalis	Yes	No	Low - Species has been assumed present on part of the Subject Land due to changes in Project Area boundaries meaning that full seasonal survey coverage has not yet been completed. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. Eight of the nine records in NSW are within 40 km of the Project Area.	Yes
Convolvulus tedmoorei	Yes	No	Low - Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. The nearest known record is 37 km east of the Project Area. From satellite imagery analysis it appears all records are strongly associated with large water bodies. Whilst the TBDC does not identify any habitat constraints, the NSW Scientific Committee Final Determination (NSW Scientific Committee 2002) identifies that the species "grows in self-mulching grey clay soils on the floodplains of the Darling and Murrumbidgee Rivers." The Project Area does not contain self-mulching grey soil on a floodplain.	No
Indigofera longibractea	Yes	Rocky creekbeds and drainage lines or within 100 m or Rocky hills, scarps, slopes and ridges or within 100 m	Low - Species has been assumed present on part of the Subject Land due to changes in Project Area boundaries meaning that full seasonal survey coverage has not yet been completed. All records in NSW are within 25 km of the Project Area. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. While no habitat constraints are identified in the TBDC, the species profile (DPE 2023d) states that the species is restricted to "an area just north of Broken Hill known as the Waukeroo Hills. Also occurs in SA at sites in the Musgrave and Flinders Ranges." The Project Area does not occur within this area and the habitat available within the Project Area is marginal. It is unlikely that the species will occur within the Project Area. However, as presence has been assumed further assessment will be undertaken in line with the precautionary principal.	Yes

Species	SAII	Habitat Constraint	Likelihood of Occurrence	Further Assessment Required?
Swainsona flavicarinata	Yes	No	Low - Species has been assumed present on part of the Subject Land due to changes in Project Area boundaries meaning that full seasonal survey coverage has not yet been completed. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. Nearest known record approximately 58 km east of the Project Area. Potential habitat occurs within the Project Area	Yes
Swainsona viridis	Yes	No	Low - Species has been assumed present on part of the Subject Land due to changes in Project Area boundaries meaning that full seasonal survey coverage has not yet been completed. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. Nearest known record approximately 25 km east of the Project Area. Potential habitat occurs within the Project Area	Yes

9.2 *Acacia rivalis* - SAII Assessment

The additional impact assessment provisions for threatened species at risk of an SAII have been addressed for *Acacia rivalis* in **Table 9.2** and **Table 9.3**.

Table 9.2 SAII Assessment – Current Population Status of *Acacia rivalis*

BAM Section 9.1.2 Criteria	Criteria	Response
2a	**Evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the:**	
2ai	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or	The TBDC does not detail population data for *Acacia rivalis.* Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population decline across 10 years or three generations. Of the nine records in the NSW BioNet Atlas, the last record was made in 2012 with eight individuals being recorded. The remaining records are from the 1970's or older and do not include an estimate of the number of individuals (DPE 2023a).
2aii	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	The TBDC does not detail population data for *Acacia rivalis*. Umwelt reviewed the scientific literature and available information. No published data is available in regard to population decline across 10 years or three generations.
2b	**Evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by:**	
2bi	An estimate of the species' current population size in NSW, and	Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population for this species. The TBDC notes that "abundance in populations is recorded as uncommon or occasional to common".
2bii	An estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and	Umwelt reviewed the scientific literature and available information. Limited published data is available to inform this criterion.
2biii	Where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	Umwelt reviewed the scientific literature and available information. Limited published data is available in to inform this criterion.

BAM Section 9.1.2 Criteria	Criteria	Response
2c	**Evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by:**	
2ci	Extent of occurrence	Recorded from the Broken Hill district, but originally found in SA, where described as being endemic and confined to the northern part of the Flinders Ranges region. There is a possibility that the species did not occur naturally in New South Wales but has become naturalised in a restricted area near Broken Hill according to the TBDC (DPE 2023a). The TBDC state that the species extent of occurrence is < 100 km^2.
2cii	Area of occupancy	The TBDC reports that the species area of occupancy is < 10 km^2.
2ciii	Number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and	The TBDC reports that the number of threat-defined locations is < = 3 locations.
2civ	Whether the species' population is likely to undergo extreme fluctuations	Limited published data is available to address this criterion.
2d	**Evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because:**	
2di	Known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g., Species is clonal) on, a biodiversity stewardship site	According to the TBDC this species "*can be grown from seeds and is listed as a promising species for use in the wattle seed industry*" (DPE 2023a). No other details on the species reproductive characteristics are noted in published literature. The species is unlikely to have reproductive characteristics that severely limit its ability to increase in population size or occupy new habitat.
2dii	The species is reliant on abiotic habitats which cannot be restored or replaced (e.g., Karst systems) on a biodiversity stewardship site, or	In NSW, *Acacia rivalis* is confined to woodland communities bordering ephemeral creeks and streams and along watercourses. The species grows in a variety of stony soils, often with limestone content. The species is not reliant on abiotic habitats that cannot be restored or replaced.
2diii	Life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g., Frogs severely impacted by chytrid fungus).	The TBDC details the following threats for *Acacia rivalis*: - Habitat clearing, extensive clearing of River Red Gum communities has disturbed populations, - Roadside disturbance and erosion. This species does not have life history traits whereby the ability to control key threatening processes is negligible.

Table 9.3 SAII Impact Assessment – *Acacia rivalis*

BAM Section 9.1.2 Criteria	Criteria	Response
4a	**The impact on the species' population (Principles 1 and 2) presented by:**	
4ai	An estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and	Species has been assumed present (one individual), on a small area of the Subject Land due to changes in boundaries. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. No *Acacia rivalis* individuals are expected to occur on the Subject Land. Eight of the nine records in NSW are within 40 km of the Project Area.
4aii	An estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or	Species has been assumed present (one individual), on a small area of the Subject Land due to changes in boundaries. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. No *Acacia rivalis* individuals are expected to occur on the Subject Land.
4aiii	If the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal	The species unit of measure is count. The area of potential habitat is 0.02 ha of PCT 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone.
4b	**Impact on geographic range (Principles 1 and 3) presented by:**	
4bi	The area of the species' geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW	The Project will impact a total area of 0.02 ha of assumed presence habitat. The TBDC reports the species area of occurrence as < 10 km^2, therefore the Project will impact approximately 0.002% of this species' area of occurrence.
4bii	The impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted	The Project will impact a total area of 0.02 ha of assumed presence habitat. No populations or subpopulations are known from the Project Area.

BAM Section 9.1.2 Criteria	Criteria	Response
4biii	To determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g., Seed dispersal) and pollination distance for the species	The Project is not expected to fragment subpopulations of the species.
4biv	To determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites.	A subpopulation is not considered to be present. However, the removal of 0.02 ha of potential habitat is unlikely to change any potential threats for this species.

9.3 *Indigofera longibractea* - SAII Assessment

The additional impact assessment provisions for threatened species at risk of an SAII have been addressed for *Indigofera longibractea* in **Table 9.4** and **Table 9.5 .**

Table 9.4 SAII Assessment – Current Population Status of *Indigofera longibractea*

BAM Section 9.1.2 Criteria	Criteria	Response
2a	**Evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the:**	
2ai	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or	The TBDC does not detail population data for *Indigofera longibractea.* Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population decline across 10 years or three generations. Of the eight records in the NSW BioNet Atlas, the last record was made in 1993 with a single individual recorded. The remaining records are from the 1970's or older and do not include an estimate of the number of individuals (DPE 2023a).
2aii	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	The TBDC does not detail population data for *Indigofera longibractea*. Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population decline across 10 years or three generations.
2b	**Evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by:**	
2bi	An estimate of the species' current population size in NSW, and	Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population for this species. The TBDC notes that "*populations are small (2-20 plants only) with plant abundance recorded as occasional or locally frequent*".
2bii	An estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and	Umwelt reviewed the scientific literature and available information. Limited published data is available to inform this criterion.
2biii	Where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature	Umwelt reviewed the scientific literature and available information. Limited published data is available to inform this criterion.

BAM Section 9.1.2 Criteria	Criteria	Response
	individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	
2c	**Evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by:**	
2ci	Extent of occurrence	The TBDC state that the species extent of occurrence is < 100 km^2. In NSW, the species inhabitants a restricted area, Waukeroo Hills, just north of Broken Hill. The species also occurs in SA, occurring throughout Musgrave and Flinders Ranges (DPE 2023a).
2cii	Area of occupancy	The TBDC reports that the species area of occupancy is < 10 km^2.
2ciii	Number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and	The TBDC reports that the number of threat-defined locations is < = 3 locations.
2civ	Whether the species' population is likely to undergo extreme fluctuations	Limited published data is available to address this criterion.
2d	**Evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because:**	
2di	Known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g., Species is clonal) on, a biodiversity stewardship site	According to the TBDC "*plants will die during drought, but site may recover from seedbank*". A threat noted in the TBDC is lack of regeneration of populations which may contain too few plants to maintain genetic integrity and diversity.
2dii	The species is reliant on abiotic habitats which cannot be restored or replaced (e.g., Karst systems) on a biodiversity stewardship site, or	Limited ecological information is available for this species. In NSW the species occurs on a variety of habitats ranging from creeks to scree slopes and ridges and creek beds, growing in limited numbers in shallow stony soils among rock outcrops (DPE 2023).
2diii	Life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g., Frogs severely impacted by chytrid fungus).	The species has numerous threats listed according to the TBDC: - Feral goat activity (rocky outcrop habitats suffer the impacts of major grazing and erosion disturbance by goats) - Grazing (rabbits, domestic stock)

BAM Section 9.1.2 Criteria	Criteria	Response
		- Lack of regeneration (population may contain too few plants to maintain genetic integrity and diversity) - Many of the outcrops and range habitat are heavily distributed and populations of *Indigofera longibractea* represent isolated stands of vegetation among tracts of agricultural and grazing land - Lack of regeneration. This species does not have life history traits whereby the ability to control key threatening processes is negligible.

Table 9.5 SAII Impact Assessment – *Indigofera longibractea*

BAM Section 9.1.2 Criteria	Criteria	Response
4a	**The impact on the species' population (Principles 1 and 2) presented by:**	
4ai	An estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and	Species has been assumed present (0.22 ha) on a small area of the Subject Land due to changes in boundaries. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. No *Indigofera longibractea* individuals are expected to occur on the Subject Land.
4aii	An estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or	Species has been assumed present (0.22 ha) on a small area of the Subject Land due to changes in boundaries. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. No Indigofera longibractea individuals are expected to occur on the Subject Land.

BAM Section 9.1.2 Criteria	Criteria	Response
4aiii	If the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal	No *Indigofera longibractea* individuals are expected to occur on the Subject Land, potential habitat has been assumed present. The area of potential habitat represents 0.02 ha of PCT 136 and 0.2 ha of PCT 155.
4b	**Impact on geographic range (Principles 1 and 3) presented by:**	
4bi	The area of the species' geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW	The Project will impact a total area of 0.22 ha of assumed presence habitat. The TBDC reports the species area of occurrence as < 10 km^2, therefore the Project will impact approximately 0.022% of this species' area of occurrence.
4bii	The impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted	The Project will impact a total area of 0.22 ha of assumed presence habitat. No populations or subpopulations are known from the Project Area.
4biii	To determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g., Seed dispersal) and pollination distance for the species	The Project is not expected to fragment subpopulations of the species.
4biv	To determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites.	A subpopulation is not considered to be present. The removal of 0.22 ha of potential habitat is unlikely to change any potential threats for this species.

9.4 *Swainsona flavicarinata* - SAII Assessment

The additional impact assessment provisions for threatened species at risk of an SAII have been addressed for *Swainsona flavicarinata* in **Table 9.6** and **Table 9.7**.

Table 9.6 SAII Assessment – Current Population Status of *Swainsona flavicarinata*

BAM Section 9.1.2 Criteria	Criteria	Response
2a	**Evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the:**	
2ai	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or	The TBDC does not detail population data for *Swainsona flavicarinata*. Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population decline across 10 years or three generations. Of the four records in the NSW BioNet Atlas, the last record was made in 2012 with 20 individuals being recorded. The remaining records are from the 1963 and 2000, with no estimate of the number of individuals (DPE 2023a).
2aii	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	The TBDC does not detail population data for *Swainsona flavicarinata.* Umwelt have reviewed the scientific literature and available information. Limited published data is available in regard to population decline across 10 years or three generations.
2b	**Evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by:**	
2bi	An estimate of the species' current population size in NSW, and	Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population for this species. The TBDC notes that this species has been "recorded as infrequent to locally common in populations".
2bii	An estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and	Umwelt reviewed the scientific literature and available information. Limited published data is available in to inform this criterion.
2biii	Where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature	Umwelt reviewed the scientific literature and available information. Limited published data is available in to inform this criterion.

BAM Section 9.1.2 Criteria	Criteria	Response
	individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	
2c	**Evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by:**	
2ci	Extent of occurrence	Not common in NSW, having an outlier population in the Broken Hill-Menindee district in the far western plains. More common in the southern parts of the NT and inland SA (DPE 2023a). The TBDC state that the species extent of occurrence is < 100 km^2.
2cii	Area of occupancy	The TBDC reports that the species area of occupancy is < 10 km^2.
2ciii	Number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and	The TBDC reports that the number of threat-defined locations is < = 3 locations.
2civ	Whether the species' population is likely to undergo extreme fluctuations	Limited published data is available to address this criterion.
2d	**Evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because:**	
2di	Known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g., Species is clonal) on, a biodiversity stewardship site	No details on the species reproductive characteristics are noted in published literature, however the species is unlikely to have reproductive characteristics that severely limit its ability to increase in population size or occupy new habitat.
2dii	The species is reliant on abiotic habitats which cannot be restored or replaced (e.g., Karst systems) on a biodiversity stewardship site, or	In NSW, *Swainsona flavicarinata* grows in a variety of soil types including deep red sand, sandy plans and ridges, in grassland and in association with water bodies such as; watercourses and flood plains near creek or rock holes (DPE 2023a). The species is not reliant on abiotic habitats that cannot be restored or replaced.
2diii	Life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g., Frogs severely impacted by chytrid fungus).	The TBDC notes the following threats for *Swainsona flavicarinata*: - Grazing - Habitat clearing

BAM Section 9.1.2 Criteria	Criteria	Response
		- Erosion (particularly in remnant Mulga communities) - Erosion and feral animal disturbance - Viability of seeds in the soil seedbank - Fire may play a role in seed germination - Lack of knowledge on priority sites and management requirements for the species. This species does not have life history traits whereby the ability to control key threatening processes is negligible.

Table 9.7 SAII Impact Assessment – *Swainsona flavicarinata*

BAM Section 9.1.2 Criteria	Criteria	Response
4a	**The impact on the species' population (Principles 1 and 2) presented by:**	
4ai	An estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and	Species has been assumed present (8.42 ha) on a portion of the Subject Land due to changes in Project Area boundaries. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. No *Swainsona flavicarinata* individuals are expected to occur on the Subject Land.
4aii	An estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or	Species has been assumed present on site due to changes in Project Area boundaries. No *Swainsona flavicarinata* individuals are expected to occur on the Subject Land and therefore be impacted by the Project.
4aiii	If the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be	No individuals are expected to occur on the Subject Land, potential habitat has been assumed present. The area of potential habitat represents 8.42 ha of PCT 155.

BAM Section 9.1.2 Criteria	Criteria	Response
	impacted, along with the area of habitat to be impacted by the proposal	
4b	**Impact on geographic range (Principles 1 and 3) presented by:**	
4bi	The area of the species' geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW	The Project will impact a total area of 8.42 ha of assumed presence habitat. The TBDC reports the species area of occurrence as < 10 km^2, therefore the Project will impact approximately 0.84% of this species' area of occurrence.
4bii	The impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted	The Project will impact a total area of 8.42 ha of assumed presence habitat. No populations or subpopulations are known from the Project Area
4biii	To determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g., Seed dispersal) and pollination distance for the species	The Project is not expected to fragment subpopulations of the species.
4biv	To determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites.	No subpopulation of this species is expected to be impacted by the Project. The TBDC lists the following threats related to this species: - Grazing - Habitat clearing - Erosion (particularly in remnant Mulga communities) - Erosion and feral animal disturbance - Viability of seeds in the soil seedbank - Fire may play a role in seed germination

BAM Section 9.1.2 Criteria	Criteria	Response
		- Lack of knowledge on priority sites and management requirements for the species. The Project may cause negligible impacts associated with habitat clearing. The threats are unlikely to be exacerbated given that the species is unlikely to occur on site.

9.5 *Swainsona viridis*- SAII Assessment

The additional impact assessment provisions for threatened species at risk of an SAII have been addressed for *Swainsona viridis* in **Table 9.8** and **Table 9.9**.

Table 9.8 SAII Assessment – Current Population Status of *Swainsona viridis*

BAM Section 9.1.2 Criteria	Criteria	Response
2a	**Evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the:**	
2ai	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or	The TBDC does not detail population data for *Swainsona viridis*. Umwelt have reviewed the scientific literature and available information. Limited published data is available in regard to population decline across 10 years or three generations. Of the nine records in the NSW BioNet Atlas, the last record was made in 2001. The remaining records are from the 1925 and 1972, with no estimate of the number of individuals (DPE 2023a).
2aii	Decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites.	The TBDC does not detail population data for *Swainsona viridis*. Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population decline across 10 years or three generations.

BAM Section 9.1.2 Criteria	Criteria	Response
2b	**Evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by:**	
2bi	An estimate of the species' current population size in NSW, and	Umwelt reviewed the scientific literature and available information. Limited published data is available in regard to population for this species.
2bii	An estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and	Umwelt reviewed the scientific literature and available information. Limited published data is available to inform this criterion.
2biii	Where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations.	Umwelt reviewed the scientific literature and available information. Limited published data is available in to inform this criterion.
2c	**Evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by:**	
2ci	Extent of occurrence	Uncommon in the Broken Hill and Silverton districts. The species also occurs in the Flinders Ranges in SA. Found in the Broken Hill area on sandy soils near watercourses (DPE 2023a). The TBDC state that the species extent of occurrence is < 100 km^2.
2cii	Area of occupancy	The TBDC reports that the species area of occupancy is < 10 km^2.
2ciii	Number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and	The TBDC reports that the number of threat-defined locations is < = 3 locations.
2civ	Whether the species' population is likely to undergo extreme fluctuations	Limited published data is available to address this criterion.
2d	**Evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because:**	
2di	Known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g., Species is clonal) on, a biodiversity stewardship site	No details on the species reproductive characteristics are noted in published literature, however the species is unlikely to have reproductive characteristics that severely limit its ability to increase in population size or occupy new habitat.

BAM Section 9.1.2 Criteria	Criteria	Response
2dii	The species is reliant on abiotic habitats which cannot be restored or replaced (e.g., Karst systems) on a biodiversity stewardship site, or	*Swainsona viridis* occurs near watercourses on or near sandy/stoney soil (DPE 2023a). The species is not reliant on abiotic habitats that cannot be restored or replaced.
2diii	Life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g., Frogs severely impacted by chytrid fungus).	The TBDC details the following threats for *Swainsona viridis*: • Lack of conservation sites. • Feral animal disturbance. • Younger plants may be palatable to goats and stock. • Habitat destruction. • Viability of seeds in the soil seedbank. This species does not have life history traits whereby the ability to control key threatening processes is negligible.

Table 9.9 SAII Impact Assessment – *Swainsona viridis*

BAM Section 9.1.2 Criteria	Criteria	Response
4a	**The impact on the species' population (Principles 1 and 2) presented by:**	
4ai	An estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and	Species has been assumed present (10.55 ha) on site due to changes in Project Area boundaries. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. No *Swainsona viridis* individuals are expected to occur on the Subject Land.

BAM Section 9.1.2 Criteria	Criteria	Response
4aii	An estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or	Species has been assumed present on site due to changes in Project Area boundaries. Throughout the majority of the Project Area detailed survey transects have searched for this species. The species has not been detected. No *Swainsona viridis* individuals are expected to occur on the Subject Land.
4aiii	If the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal	No individuals are expected to occur on the Subject Land, potential habitat has been assumed present. The area of potential habitat represents 2.12 ha of PCT 123 and 8.42 ha of PCT 155.
4b	**Impact on geographic range (Principles 1 and 3) presented by:**	
4bi	The area of the species' geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW	The proposal will impact a total area of 10.55 ha, comprising PCT 123 (2.12 ha) and PCT 155 (8.42 ha) which provides potential habitat for the species. The TBDC reports the species area of occurrence as < 10 km^2, therefore the Project will impact approximately 1.06% of this species' area of occurrence.
4bii	The impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted	The Project will impact a total area of 10.55 ha of assumed presence habitat. No populations or subpopulations are known from the Project Area
4biii	To determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g., Seed dispersal) and pollination distance for the species	The Project is not expected to fragment subpopulations of the species.

BAM Section 9.1.2 Criteria	Criteria	Response
4biv	To determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites.	No subpopulation is expected to be impacted by the Project. The TBDC lists the following threats related to this species as follows: • Lack of conservation sites. • Feral animal disturbance. • Younger plants may be palatable to goats and stock. • Habitat destruction. • Viability of seeds in the soil seedbank (OEH 2019). The threats are unlikely to be exacerbated given that the species is unlikely to occur on site.

10.0 Impact Summary

10.1 Determining an Offset Requirement for Impacts

10.1.1 Impacts on Native Vegetation and TECs (ecosystem credits)

The PCTs and associated condition zones which require an offset are listed in **Table 10.1** and **Table 10.2**. All mapped vegetation zones in the Subject Land require offsetting. Note there are minor areas in the Subject Land associated with previous mining activities that do not contain native vegetation, these are mapped as cleared areas. Refer to **Figure 10.1** for areas requiring an offset.

Table 10.1 Impacts that require an offset – Ecosystem credits – SCES Facility

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
5	5 - 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion Good	No	5.21	56.6	0	-56.6	1.50	111
7	7 - 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone Good	No	3.45	54.9	0	-54.9	1.50	71
10	10 - 155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones Good	No	22.40	30.6	0	-30.6	1.75	300
Total ecosystem credits								**482**

Table 10.2 Impacts that require an offset – Ecosystem credits- Transmission Line

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
1	1 - 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone Derived Shrubland	No	0.05	51.8	0	-51.8	1.50	1
2	2 - 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone High Weed Cover	No	0.47	45.7	0	-45.7	1.50	8
3	3 - 41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone Planted	No	0.11	47.9	0	-47.9	1.50	2
4	4 - 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion Dieback	No	0.22	30.9	0	-30.9	1.50	3
5	5 - 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion Good	No	3.92	44.8	0	-44.8	1.50	66
6	6 - 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone Disturbed	No	0.11	45.6	0	-45.6	1.50	2

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
7	7 - 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone Good	No	0.09	54.6	0	-54.6	1.50	2
8	8 - 150 Bottlewasher - Copperburr grassland of the arid zone Good	No	1.05	32.3	0	-32.3	1.50	13
9	9 - 155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones Disturbed	No	0.87	38.7	0	-38.7	1.75	15
10	10 - 155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones Good	No	7.77	82	0	-82	1.75	279
11	11 - 158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) Good	No	0.38	55.4	0	-55.4	2.00	11
Total ecosystem credits								**402**

10.1.2 Impacts on Threatened Species and Their Habitat (species credit)

As outlined in **Section 5.5** and **8.1**, several species-credit species have been assumed present on part of the Subject Land to enable the completion of the BDAR. Surveys of the remaining areas requiring seasonal survey for these species, identified in the table below, will be completed in Spring 2023. **Table 10.3** provides a summary of the species credit threatened that require an offset (as per BAM Subsection 9.2.2(2.)) and identifies the amount of credits required. The area within the Subject Land which was included within the total of all species polygons is shown in **Figure 10.2**.

Table 10.3 Impacts that require an offset – Species credits - SCES Facility

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
Mallee Golden Wattle	*Acacia notabilis*	E	-	1 individual (0.22 ha)	2	2
Creek Wattle	*Acacia rivalis*	E	-	1 individual (0.01 ha)	3	3
Showy Indigo	*Indigofera longibractea*	E	-	0.22 ha	3	6
Yellow-Keeled Swainsona	*Swainsona flavicarinata*	E	-	8.42 ha	3	193
Slender Darling Pea	*Swainsona murrayana*	V	V	8.42 ha	2	129
Creeping Darling Pea	*Swainsona viridis*	E	-	10.55 ha	3	282
Total species credits						**615**

10.1.3 Indirect and Prescribed Impacts

No offsets are required or proposed for indirect and prescribed impacts.

10.2 Impacts That Do Not Need Further Assessment

Areas within the Subject Land that do not contain native vegetation do not need to be assessed for ecosystem credits (as per BAM Section 9.3(1–2.)). There are minor areas in the Subject Land associated with previous mining activities that do not contain native vegetation, along with cleared roads and tracks.

Within the Subject Land planted street trees were identified in a road reserve in the southern portion of the Transmission Line. These trees were identified as not being locally endemic, comprising *Eucalyptus dundasii* (endemic to Western Australia) and *Eucalyptus torquata* (endemic to Western Australia). The planted native vegetation assessment module (as per BAM Appendix D) has been used to assess this vegetation; this is presented in **Table 10.4** below.

Table 10.4 Streamlined assessment module – Planted native vegetation

D.1 Decision Making Key	Response
1. Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal? i. Yes .... The planted native vegetation must be allocated to the best-fit PCT and the BAM must be applied. ii. No..... Go to 2.	No.
2. Is the planted native vegetation: a. planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and b. the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat? i. Yes .... The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM. ii. No..... Go to 3	No.
3. Is the planted/translocated native vegetation individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of the following: a. a species recovery project b. Saving our Species project c. other types of government funded restoration project d. condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat e. legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act) f. ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or g. approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW Water Management Act 2000)? i. Yes .... The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM ii. No..... Go to 4.	No.
4. Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation? i. Yes..... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied). ii. No..... Go to 5	No.

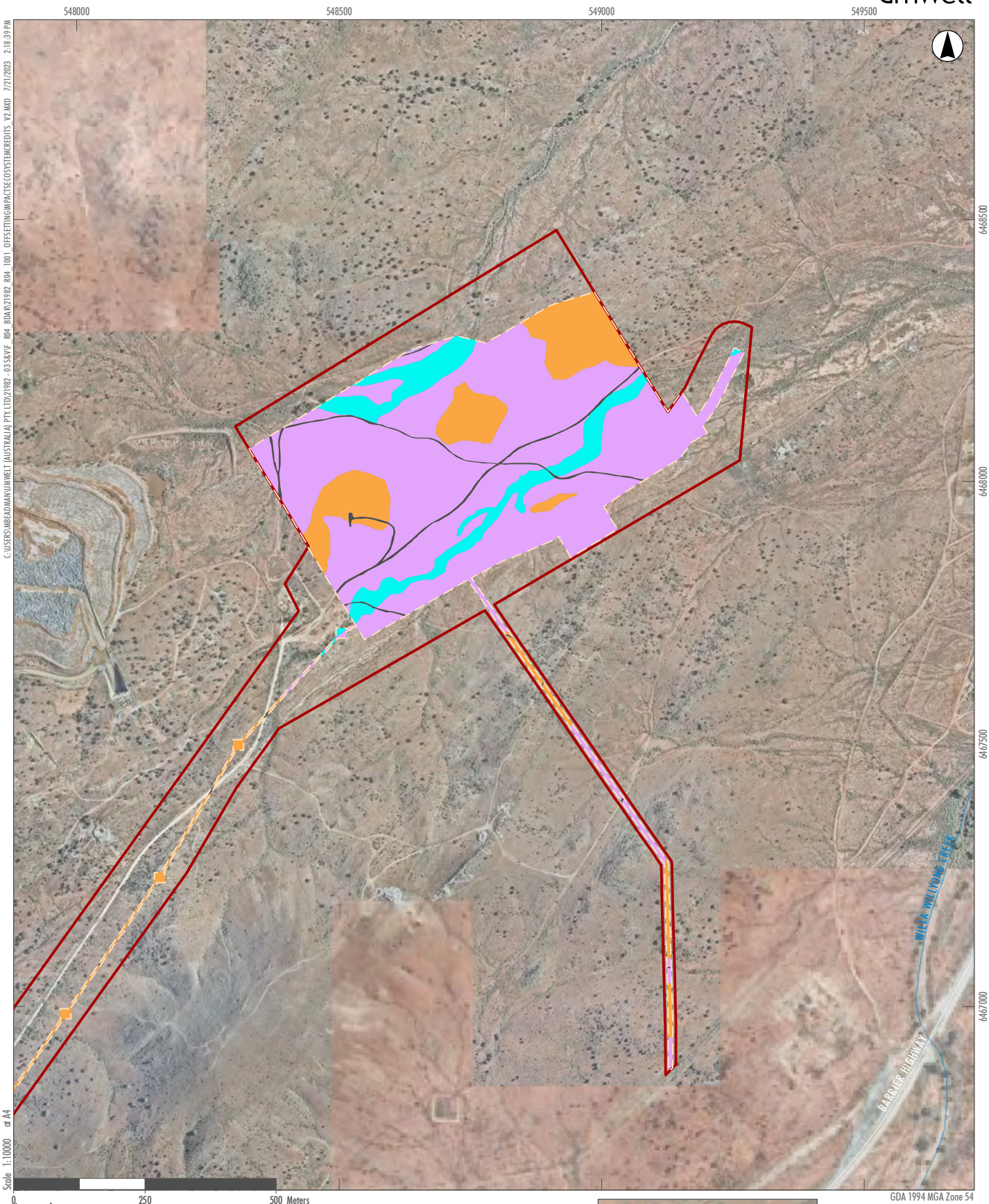
D.1 Decision Making Key		Response
5.	**Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?** i. Yes .... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied). i. No..... Go to 6.	Yes. **Planted street trees, D.2.**

D.2 Assessment of planted native vegetation for threatened species habitat

The assessor must assess the suitability of the planted native vegetation for use by threatened species and record any incidental sightings or evidence (e.g., scats, stick nests) of threatened species credit species (flora and fauna) using, inhabiting or being part of the planted native vegetation. If there is evidence that threatened species are using the planted native vegetation as habitat, the assessor must apply Section 8.4 of the BAM to mitigate and manage impacts on these species. Species credits are not required to offset the proposed impacts. The steps taken to assess threatened species habitat and all reasonable measures proposed to be taken to mitigate or minimise impacts must be set out in the BDAR or BCAR.

Planted street trees are present within the Subject Land along the B79 Silver City Highway. These trees were sampled using rapid vegetation surveys and were identified as being endemic to Western Australia, and were therefore unable to be assigned to a PCT. The planted trees were surveyed for habitat features such as hollows or stick nests, and for presence of threatened species, none of which were identified. The trees although are not endemic to the region, however, may act a food source for fauna when flowering. No further assessment is required.

Images of street trees are provided below.



Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

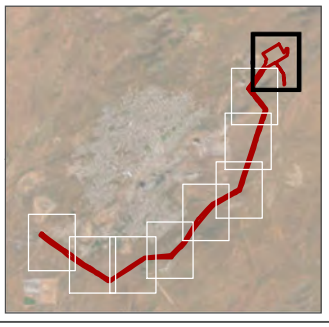


FIGURE 10.1A

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Planted
- Cleared

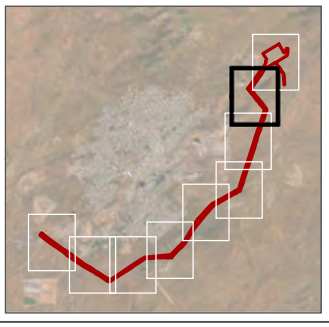


FIGURE 10.1B

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

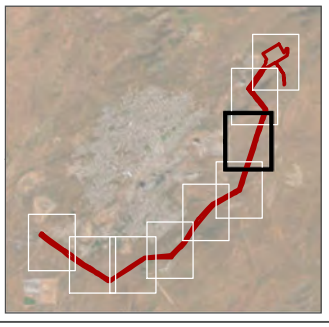


FIGURE 10.1C

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Dieback
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

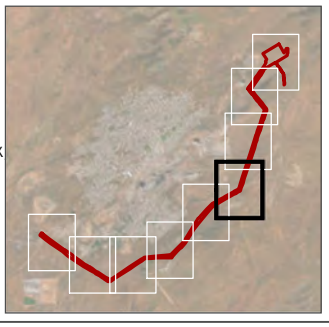


FIGURE 10.1D

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

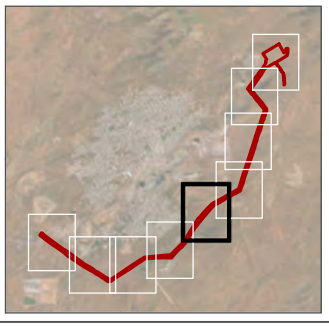


FIGURE 10.1E

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

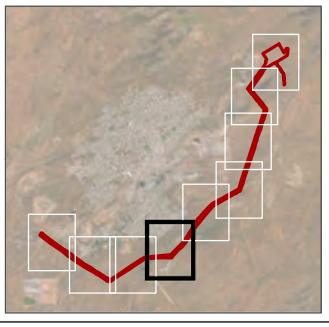


FIGURE 10.1F

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

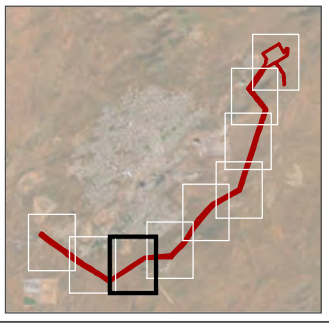


FIGURE 10.1G

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Derived Shrubland
- Cleared
- Planted Street Trees

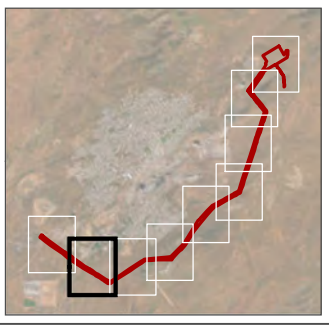


FIGURE 10.1H

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land

Areas Requiring an Offset: Plant Community Type

- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Disturbed - High Weed Cover
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- Cleared

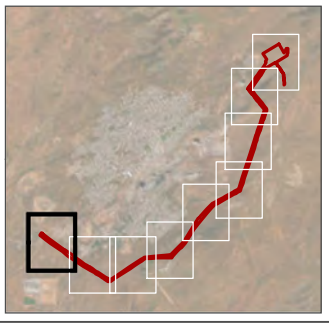


Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE 10.11

Thresholds for Assessing and Offsetting Impacts - Ecosystem Credit Species

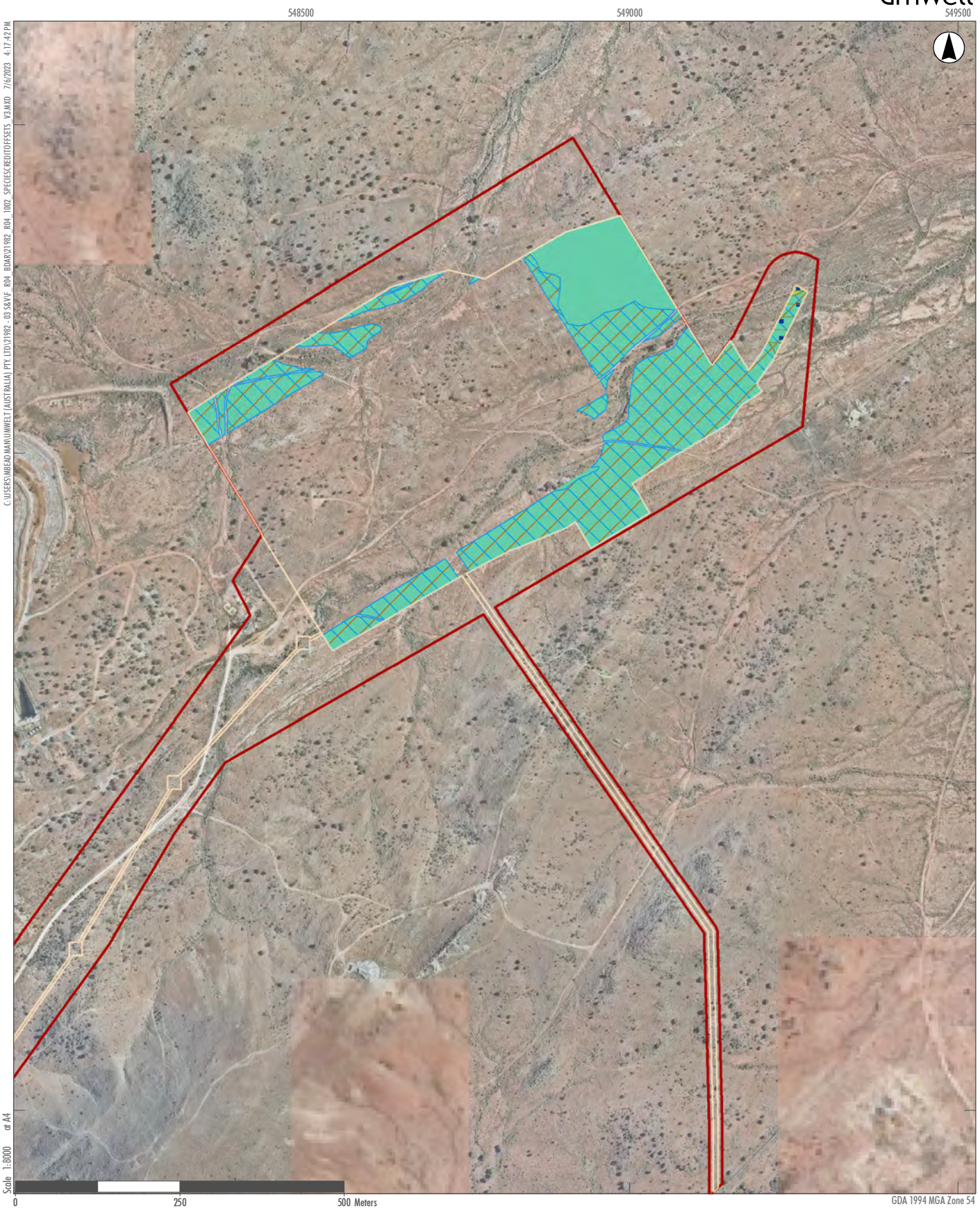


FIGURE 10.2

Thresholds for Assessing and Offsetting Impacts
Species Credit Species

Image Source: ESRI Basemap (2021); Nearmap (2022) Data source: DPIE (2023)

11.0 Biodiversity Credit Report

Biodiversity Credit Reports which identify the like-for-like and variation credit requirements are provided in **Appendix E.**

11.1 Ecosystem Credits

The ecosystem credit requirements and those that could be retired in accordance with the offset rules are listed in **Table 11.1** (SCES Facility) and **Table 11.2** (Transmission Line).

Table 11.1 Ecosystem credit class and matching credit profiles – SCES Facility

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC	Offset trading group	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
PCT 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion **111 credits**	60, 68, 120, 121, 123, 127, 130, 132, 138, 169, 194, 359	Stony Desert Mulga Shrublands	Arid Shrublands (Acacia sub-formation)	No	Stony Desert Mulga Shrublands <50%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.
PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone **71 credits**	61, 136, 150, 155, 156, 167, 183, 210, 224	Gibber Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)	No	Gibber Chenopod Shrublands <50%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC	Offset trading group	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones **300 credits**	155, 156	Gibber Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)	No	Gibber Chenopod Shrublands >=50% and <70%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.

Table 11.2 Ecosystem credit class and matching credit profiles – Transmission Line

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC	Offset trading group	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
PCT 41 River Red Gum open woodland wetland of intermittent watercourses **11 credits**	37, 38, 39, 40, 41, 55, 67, 87, 200, 207, 230, 231	North-west Floodplain Woodlands	Semi-arid Woodlands (Grassy sub-formation)	No	North-west Floodplain Woodlands <50%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.
PCT 123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion **69 credits**	60, 68, 120, 121, 123, 127, 130, 132, 138, 169, 194, 359	Stony Desert Mulga Shrublands	Arid Shrublands (Acacia sub-formation)	No	Stony Desert Mulga Shrublands <50%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC	Offset trading group	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone **4 credits**	61, 136, 150, 155, 156, 167, 183, 210, 224	Gibber Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)	No	Gibber Chenopod Shrublands <50%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.
PCT150 Bottlewasher - Copperburr grassland of the arid zone **13 credits**	61, 136, 150, 155, 156, 167, 183, 210, 224	Gibber Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)	No	Gibber Chenopod Shrublands <50%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC	Offset trading group	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones **294 credits**	155, 156	Gibber Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)	No	Gibber Chenopod Shrublands >=50% and <70%	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.
PCT158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) **11 credits**	158, 159, 195	Riverine Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)	No	Riverine Chenopod Shrublands >=70% and	No	Barrier Range, Barrier Range Outwash and Strzelecki Desert. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site.

11.2 Species Credits

The species credit requirements and those that could be retired in accordance with the offset rules are listed in **Table 11.3**. As discussed previously in this report, currently candidate flora species credits are being generated for parts of the SCES Facility portion of the Subject Land that were unable to be surveyed due to Project boundary changes following the completion of seasonal surveys.

Table 11.3 Species Credit Class and Matching Credit Profiles

Species Credit	Attributes shared with matching credits				
	Name of threatened species	**Kingdom**	**BC Act status**	**EPBC Act status**	**IBRA region**
Mallee Golden Wattle *Acacia notabilis* **2 credits**	Like for Like Rules: *Acacia notabilis*	Flora	Endangered	Not listed	Any in NSW
Creek Wattle *Acacia rivalis* **3 credits**	Like for Like Rules: *Acacia rivalis*	Flora	Endangered	Not listed	Any in NSW
Showy Indigo *Indigofera longibractea* **6 credits**	Like for Like Rules: *Indigofera longibractea*	Flora	Endangered	Not listed	Any in NSW
Yellow-Keeled Swainsona *Swainsona flavicarinata* **193 Credits**	Like for Like Rules: *Swainsona flavicarinata*	Flora	Endangered	Not listed	Any in NSW
Slender Darling Pea *Swainsona murrayana* **129 credits**	Like for Like Rules: *Swainsona murrayana*	Flora	Vulnerable	Vulnerable	Any in NSW
Creeping Darling Pea *Swainsona viridis* **282 credits**	Like for Like Rules: *Swainsona viridis*	Flora	Endangered	Not listed	Any in NSW

11.3 Biodiversity Offset Strategy

A-CAES NSW currently proposes to retire biodiversity credits associated with the Project through a combination of payment into the Biodiversity Conservation Fund (BCF) and generation of biodiversity credits through the establishment of a Biodiversity Stewardship Agreement (BSA). An application for a price estimate using the BCF has been submitted to Biodiversity Conservation Trust (BCT) and A-CAES is aware of the costs associated with this offsetting approach. A-CAES NSW will also consult with the NSW Credit Supply Taskforce in relation to credit retirement.

As part of the associated land agreements with Perilya, A-CAES NSW is purchasing the land associated with the SCES Facility. Approximately 32.75 ha will not be disturbed as a result of the Project and may be used to generate biodiversity credits through the establishment of a BSA (refer to **Figure 11.1**). These comprise the following three land parcels:

- Lot 2 DP 757268
- Lot 3 DP 757268
- Lot 5 DP 757268

Table 11.4 below details the PCTs according to regional mapping and the potential credit generation based on a desktop assessment. A preliminary BAM calculator assessment on the potential credit yields of the land has been undertaken for relevant PCTs to the Project Area using plot data collected as part of the impact assessment. It should be emphasised that these are estimates only and the final credit outcome will be dependent on full floristics surveys in accordance with the BAM, consideration of land use that prevents credit generation (easements, encumbrances, existing conservation measures, etc.) and indirect impacts from surrounding land uses.

Based on this preliminary BAM calculator assessment, approximately 32% of the ecosystem credits required for the Project could be generated by the land. Overall, 284 credits could be generated, which can contribute to the 884 ecosystem credits required for the Project.

Table 11.4 Potential Ecosystem Credit Generation

PCT	Offset Trading Group	Areas (ha) within Potential Offset Site	Potential Number of Ecosystem Credits Generated within Potential Offset Site
PCT 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion	Stony Desert Mulga Shrublands - < 50% cleared group	1.8	17
PCT128 - Nelia tall open shrubland of semi-arid sandplains*	N/A	1.0	Credits not calculated, PCT not from a matching Offset Trading Group
PCT 155 – Bluebush shrubland on stony rises and downs in the arid and semi-arid zones	Gibber Chenopod Shrublands - ≥ 50% - < 70%	18.4	167

PCT	Offset Trading Group	Areas (ha) within Potential Offset Site	Potential Number of Ecosystem Credits Generated within Potential Offset Site
PCT 359 - Porcupine Grass - Red Mallee - Gum Coolabah hummock grassland / low sparse woodland on metamorphic ranges on the Barrier Range, Broken Hill Complex Bioregion*	Stony Desert Mulga Shrublands - < 50% cleared group	11.6	100
Total		32.75	284

*Not present with the Project Area and no BAM plot data collected. 50% of benchmark values applied for this desktop assessment.

FIGURE 11.1

Potential Offset Site

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

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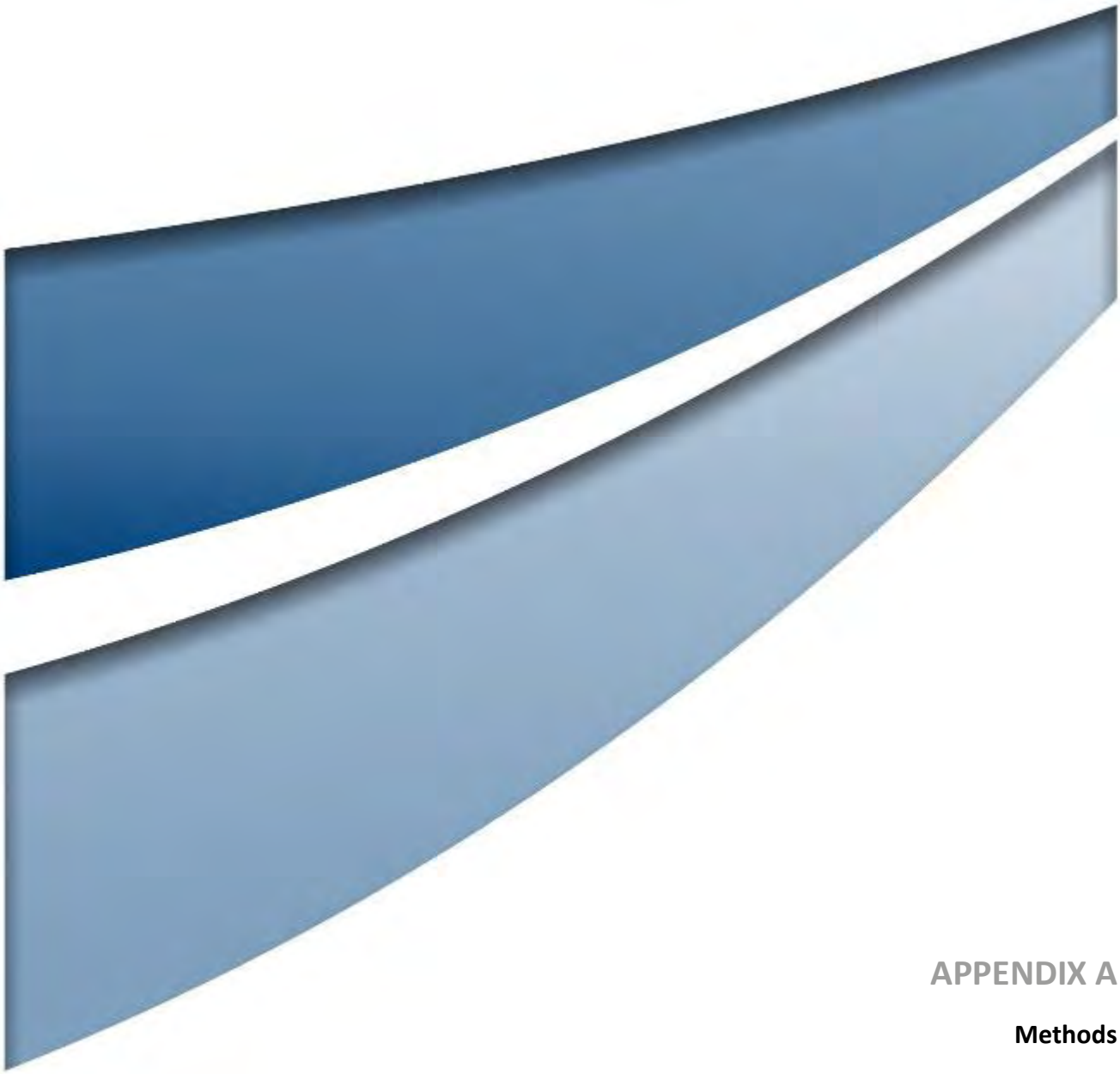

APPENDIX A

Methods

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BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

Appendix A – Methods

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Figures

Tables

1.0 Silver City Energy Storage Facility Methods

1.1 Site Context Methods

1.1.1 Landscape Features

As detailed in Section 3 of the Biodiversity Assessment Methodology (BAM) (DPIE 2020a), a landscape assessment for the Project is required, which was initially conducted as a desktop assessment and confirmed during the field surveys.

The Transmission Line, which is assessed as a linear development requires a 500 m buffer, the SCES which is assessed as a standard development requires a 1500 m buffer. Landscape features such as IBRA bioregions, IBRA subregions, and native vegetation extent within a buffer area, cleared areas, rivers, streams, wetlands and connectivity features were identified, where present within the Project Area in accordance with Section 3 of the BAM (DPE 2020a) and were sourced and/or derived from spatial information.

1.2 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity Methods

1.2.1 Existing Information

The following existing information was reviewed to inform the identification of Plant Community Types (PCTs) (Section 4.2 of the BDAR) and Threatened Ecological Communities (TECs) (Section 4.3 of the BDAR):

Relevant documents included:

- VIS Classification Database (DPE 2022a), last accessed June 2023.
- DCCEEW Protected Matters Search Tool for known/predicted EPBC Act-listed TECs, last accessed June 2023.
- NSW State Vegetation Type Map: Western 1.0 (VIS_ID 4492) (DPE 2019).

1.2.2 Mapping Native Vegetation Extent, Plant Community Types and Vegetation Condition Zones

The native vegetation extent (Section 4.1 of the BDAR) within the Subject Land was determined during site surveys, through GIS Mapping and aerial photograph interpretation using recent aerial imagery. Native vegetation and plant community type mapping was undertaken using best-practice techniques to delineate vegetation communities across the Subject Land. Vegetation mapping involved the following key steps:

- review of aerial imagery to assess vegetation distribution patterns as dictated by change in canopy texture, tone, and colour, as well as topography
- review of the modelled distribution of vegetation communities within broader scale regional based vegetation mapping

- preparation of a draft plant community type map based on interpretation of digital aerial imagery
- field-based ground-truthing of the draft plant community type mapping
- confirmation of vegetation community floristic delineations based on plot data.

Vegetation communities were delineated through the identification of repeating patterns of plant species assemblages in each of the identified strata. Slight variations in species composition are typical across the extent of a community and are often associated with microhabitats or ecotones with other communities.

Mapping is broad-scale and does not represent a detailed site-specific mapping of native vegetation cover in the offsite areas and should not be used for any purpose other than the estimation of native vegetation cover under the BAM (DPE, 2020a).

1.2.3 Plot-Based Vegetation Survey

A stratified plot-based floristic vegetation survey of the subject land was undertaken in accordance with Table 3 and Section 4.2.1 of the BAM.

The BAM Vegetation Integrity Plots were sampled across the two assessed SCES Facility and Transmission line to meet the minimal plot requirements. The BAM plots were sampled by Umwelt ecologists on the following dates:

- 27 June–1 July 2022
- 1–2 March 2023.

Each BAM Plot consisted of a 20x20 m floristic plot nested within each 20x50 m vegetation integrity plot. Plot locations were recorded with a hand-held GPS device and are shown in **Figure A.1**. All vascular plants recorded within floristic plots were identified using keys and nomenclature in Plantnet NSW Flora Online Identification Keys (The Royal Botanic Gardens and Domain Trust 2022). BAM Plot survey effort, alongside the BAM Plot requirement for the SCES and Transmission Line are presented in **Table A.1** and **Table A.2**.

The floristic survey data collected included the survey data requirements identified in Table 1 of the BAM. The plot survey effort was completed to ensure compliance with the stratification requirements of Table 3 of the BAM. Plot locations were selected to ensure that they captured attributes relevant to each vegetation condition zone. Plots were established to provide a representative assessment of the vegetation integrity of the vegetation zone, accounting for the level of variation in the broad condition state of the vegetation zone. Plots were positioned to avoid locations on ecotones, tracks (their edges) and/or small disturbed areas generally inconsistent with the target vegetation zone (e.g., small patches of bare ground).

At each plot, roughly 45 to 60 minutes was spent searching for all vascular flora species present within the 20 x 20 m floristic plot. Searches were generally undertaken through parallel transects from one side of the plot to another.

Table A.1 BAM Plot Survey Effort – SCES Facility

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area in the Subject Land (ha)	Number of Floristic and Vegetation Integrity Plots	
			Required	Completed
1	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone – *Derived Shrubland*	0	0	0
2	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone – *High Weed Cover*	0	0	0
3	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone – *Planted*	0	0	0
4	123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion – *Die back*	0	0	0
5	123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion – *Good*	5.21	3	3
6	136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone – *Disturbed (High Weed Cover)*	0	0	0
7	136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone – *Good*	3.45	2	3
8	150 Bottlewasher - Copperburr grassland of the arid zone – *Good*	0	0	0
9	155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones – *Disturbed*	0	0	0
10	155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones – *Good*	22.40	4	4
11	158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) – *Good*	0	0	0
-	Cleared	0.63	-	-
Total		**31.68**	**9**	**10**

Table A.2 BAM Plot Survey Effort – Transmission Line

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area in the Subject Land (ha)	Number of Floristic and Vegetation Integrity Plots	
			Required	Completed
1	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone – *Derived Shrubland*	0.05	1	1
2	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone – *High Weed Cover*	0.47	1	1
3	41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone – *Planted*	0.11	1	1
4	123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion – *Die back*	0.22	1	1
5	123 Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion – *Good*	3.92	2	5
6	136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone – *Disturbed (High Weed Cover)*	0.11	1	2
7	136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone – *Good*	0.09	1	1
8	150 Bottlewasher – Copperburr grassland of the arid zone – *Good*	1.05	1	2
9	155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones – *Disturbed*	0.87	1	2
10	155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones – *Good*	7.77	3	5
11	158 Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) – *Good*	0.38	1	2
-	Cleared and Planted Street Trees	0.89	-	-
Total		**15.93**	**14**	**23**

1.2.4 Vegetation Integrity Survey

As part of the plot-based vegetation survey, native vegetation composition, structure and function attributes identified in Section 4.3.4 of the BAM was assessed for each BAM plot. The locations of the plots sampled are mapped to scale and shown as BAM Plots in **Figure A.1.**

1.2.5 Rapid Vegetation Assessments

Rapid vegetation assessments were undertaken throughout the Project Area. A total of 31 rapid vegetation assessments were collected as part of the biodiversity assessment. The locations of the rapid vegetation assessments are provided in **Figure A.1**.

Rapid vegetation assessments collected qualitative data including but not limited to:

- Species diversity
- Vegetation structure
- Extent of disturbance
- Likely PCT allocation, and
- Potential for TEC alignment.

The use of rapid vegetation assessments assisted with mapping native vegetation within the Project Area, particularly demonstrating changes in PCT's and condition.

1.2.6 Meandering Transects

Meandering transects were also walked across the Project Area in between the collection of floristic plots, or for the deployment or collection of remote cameras. Opportunistic sampling of vegetation was undertaken along these transects, particularly searches for threatened and otherwise significant species, endangered populations and TECs.

Meandering transects provided information on spatial patterns of vegetation that informed vegetation community mapping of the Subject Land.

1.2.7 Digital Aerial Photography Interpretation

Digital imagery (aerial photographs) of the Project Area was viewed prior to and after vegetation survey to identify spatial patterns in vegetation, land use and landscape features. These informed field survey design and implementation, ecological assessment and vegetation community mapping of the Subject Land. Mapping was undertaken using the QGIS 3.14 and ESRI ArcMap 10.6.

1.2.8 Plant Identification and Nomenclature Standards

All vascular plants recorded or collected within plots and on meandering transects were identified using keys and nomenclature in Harden (1992, 1993, 2000 and 2002). Where known, changes to nomenclature and classification have been incorporated into the results. Updated taxonomy has been derived from PlantNET (Botanic Gardens Trust 2020).

The specimens collected during the survey that were lacking adequate flowering or fruiting material were not of potential significance or importance and so were identified to genus level only.

Common names follow Harden (1992, 1993, 2000 and 2002) where available, and draw on other sources such as local names where these references do not provide a common name.

1.2.9 Threatened Ecological Community Delineation

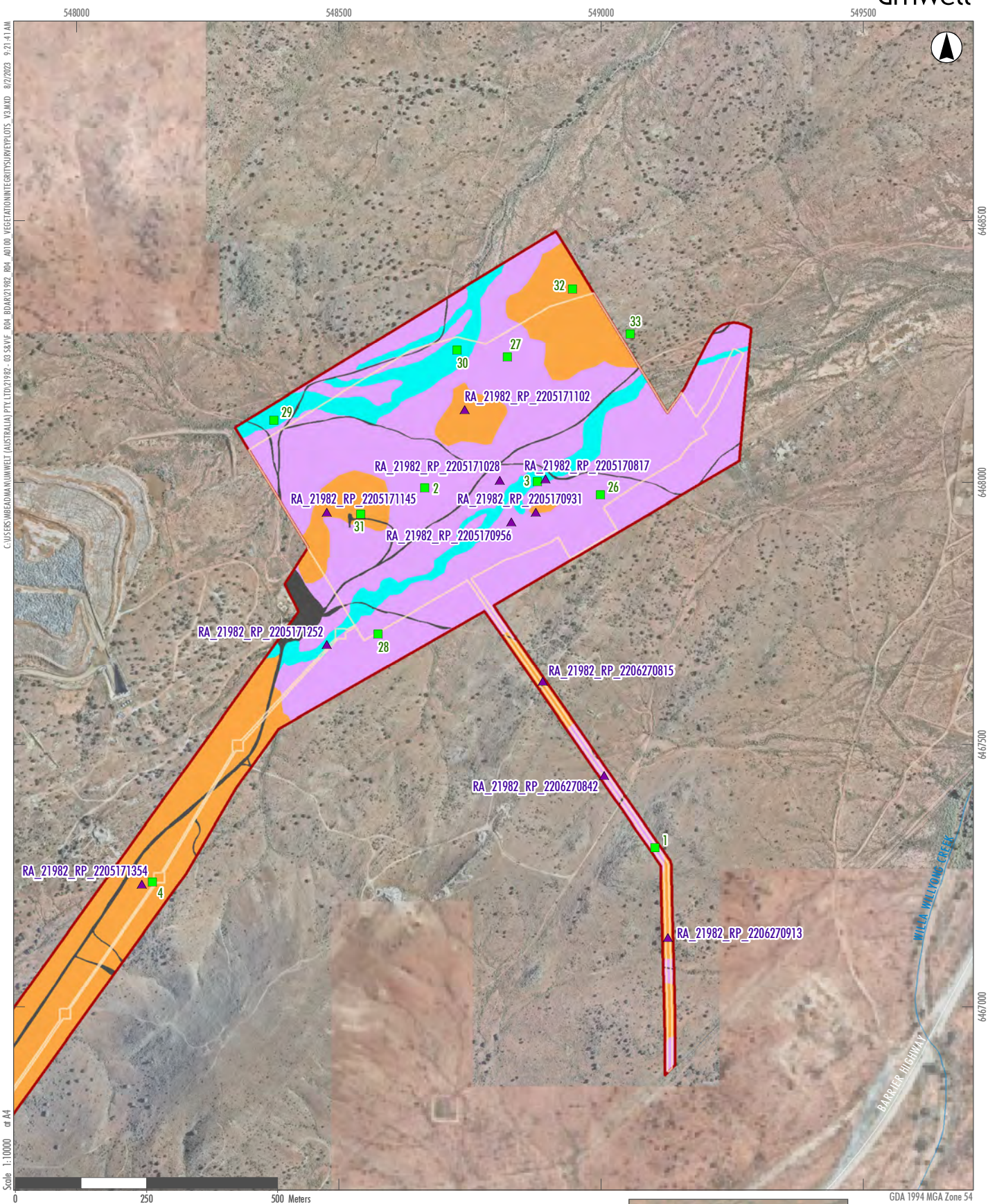
Where applicable, vegetation communities identified in the Subject Land were compared to TECs listed under the Commonwealth EPBC Act and NSW BC Act and an assessment of similarity with the NSW Scientific Committee Final Determinations and the Commonwealth Threatened Species Scientific Committee Listing and Conservation Advice. The following approach was used:

- full-floristic plot assessments and meandering surveys to determine floristic composition and structure of each ecological community
- comparison with published species lists, including lists of 'important species' as identified on the listing advice provided by the NSW Scientific Committee and/or Commonwealth Threatened Species Scientific Committee
- comparison with habitat descriptions and distributions for listed TECs
- assessment using guidelines and recovery plans published by the Commonwealth Department DCCEEW and the NSW BCD
- comparison with other assessments of TECs in the region.

1.2.10 Plant Community Type Allocation

Each of the vegetation communities described within the Subject Land were aligned with an equivalent PCT as detailed in the VIS Classification Database (DPIE 2023c). For each vegetation community described in the Subject Land, the dominant and characteristic species were entered into the online plant community identification tab and an initial list of PCTs was generated. The profiles for each of the possible PCTs were then interrogated and the most appropriate match assigned based on floristic, structure, soil, landform and distribution details.

Further detail regarding this allocation for individual PCT is outlined in Section 4.2.2 of the BDAR.



Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

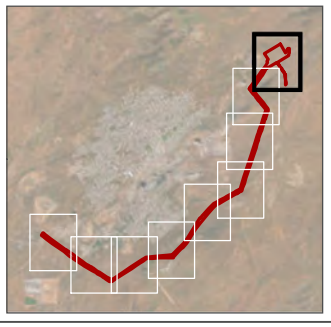
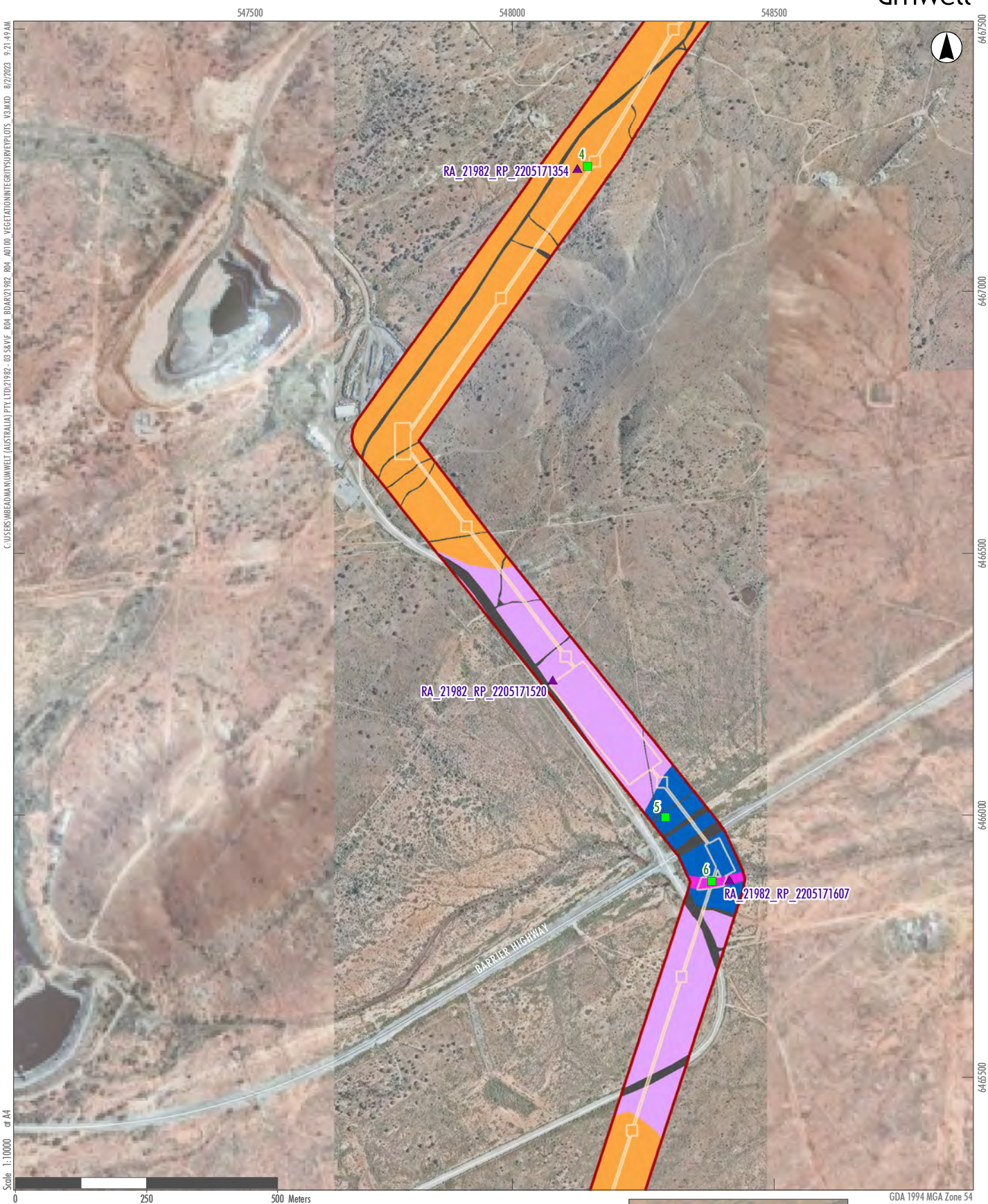


FIGURE A1.A

Vegetation Integrity Survey Plots

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Planted
- Cleared

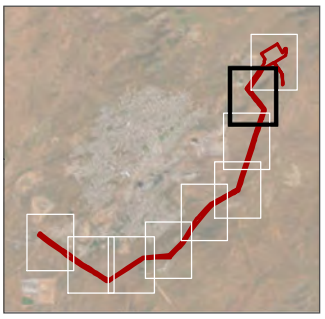


Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE A1.B

Vegetation Integrity Survey Plots

Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

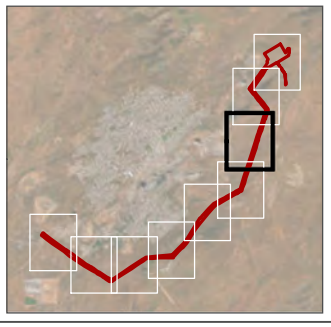
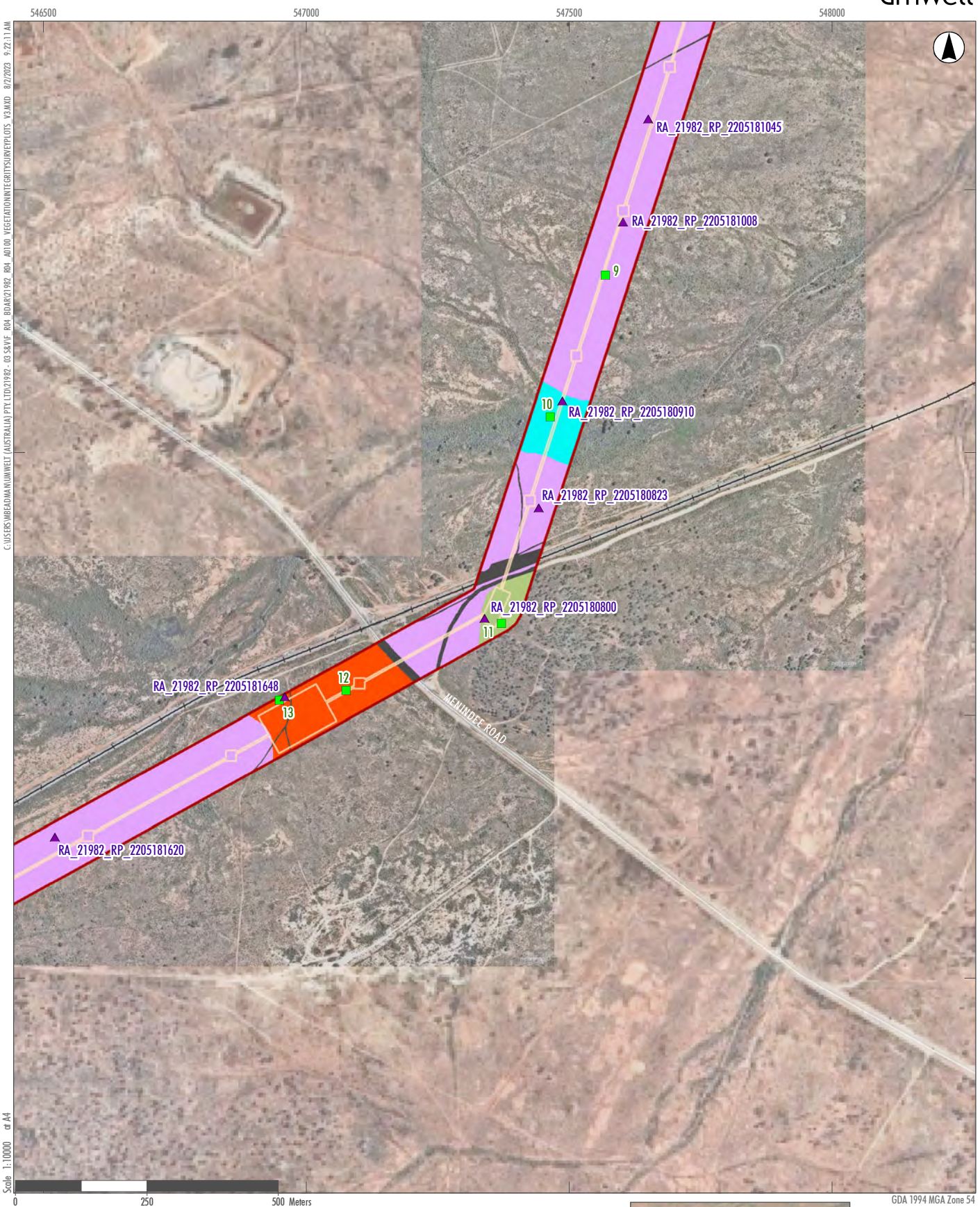


FIGURE A1.C

Vegetation Integrity Survey Plots

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Dieback
- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

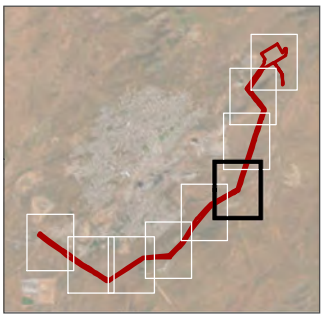


FIGURE A1.D

Vegetation Integrity Survey Plots

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 150 - Bottlewasher - Copperburr grassland of the arid zone - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- Cleared

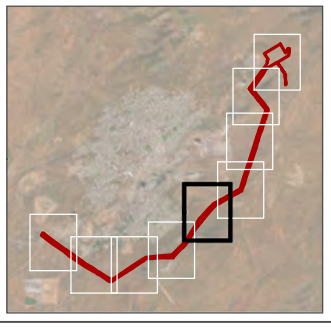
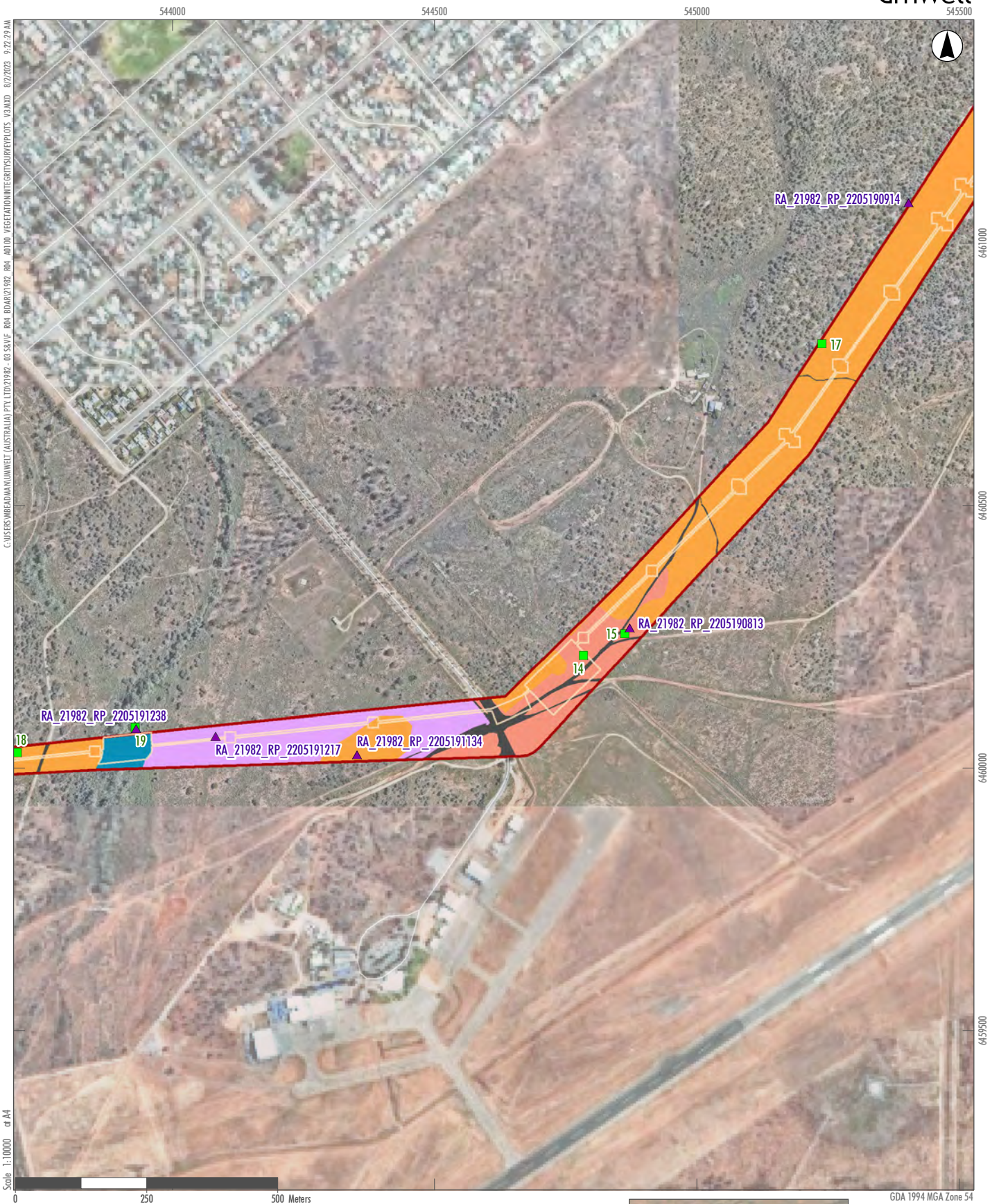


FIGURE A1.E

Vegetation Integrity Survey Plots

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



C:\USERS\MBEADMAN\UMWELT (AUSTRALIA) PTY LTD\21982 - 03 S&VF_R04_BDAR\21982_R04_A01.00_VEGETATIONINTEGRITYSURVEYPLOTS_V3.MXD 8/2/2023 9:22:29 AM

Scale 1: 10000 at A4

Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

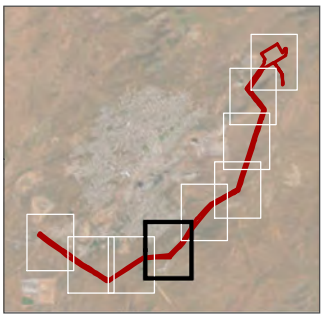


FIGURE A1.F

Vegetation Integrity Survey Plots

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 123 - Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion - Good
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - High Weed Cover
- Cleared

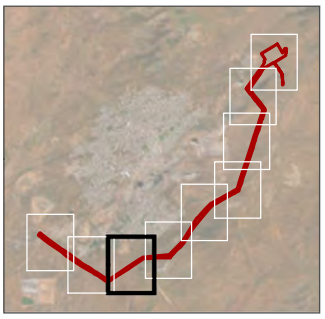
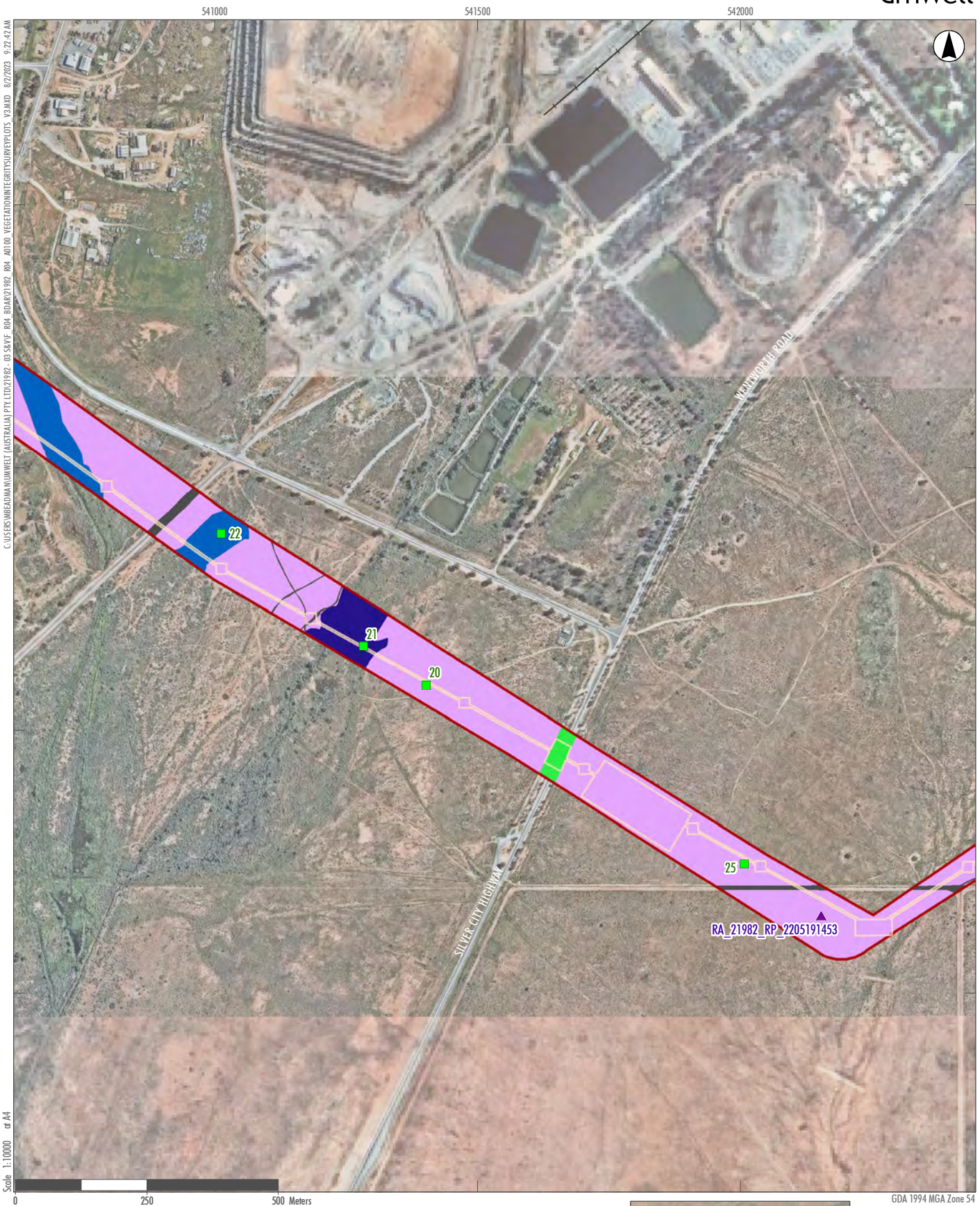


FIGURE A1.G

Vegetation Integrity Survey Plots

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Rapid Vegetation Assessment Points
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- 41 - River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone - Derived Shrubland
- Cleared
- Planted Street Trees

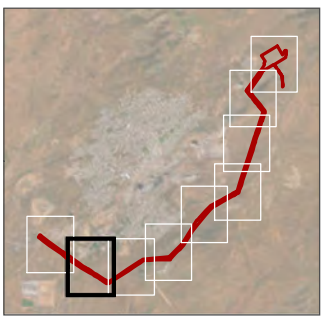
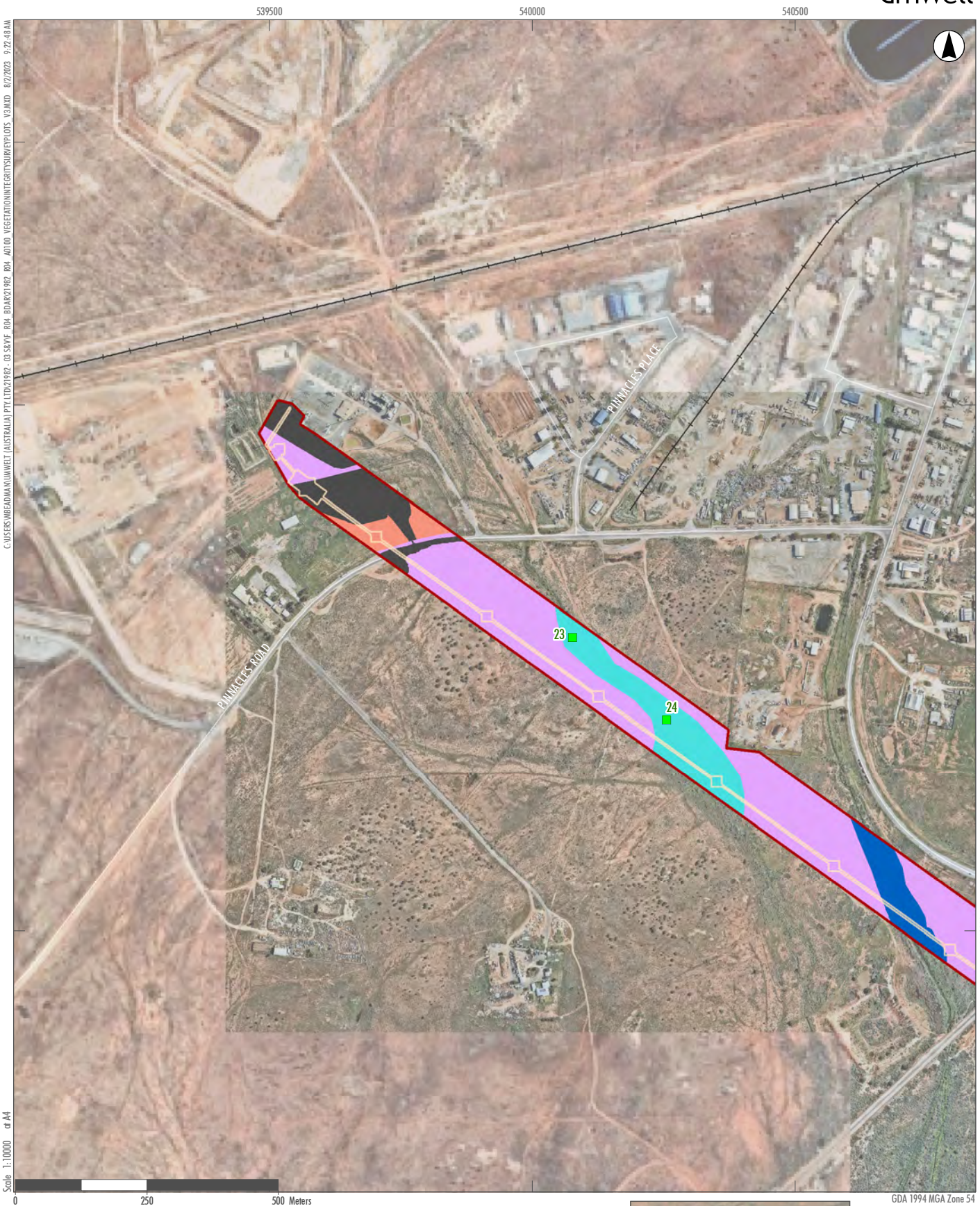


Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE A1.H

Vegetation Integrity Survey Plots



Legend

- Project Area
- Subject Land
- BAM Plots

Plant Community Type (PCT ID - Name - Condition)

- 136 - Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone - Disturbed - High Weed Cover
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Disturbed
- 155 - Bluebush shrubland on stony rises and downs in the arid and semi-arid zones - Good
- 158 - Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW) - Good
- Cleared

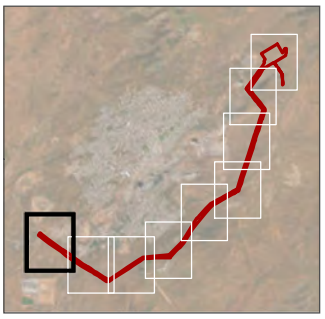


Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE A1.1

Vegetation Integrity Survey Plots

1.3 Threatened Flora Survey Methods

1.3.1 Review of Existing Information

The following existing information was reviewed to inform the threatened flora species surveys and assessment of habitat constraints and microhabitats:

- Biodiversity Assessment Method Calculator (BAMC).
- Threatened flora records held on the NSW BioNet Atlas of NSW Wildlife within the Project Area (DPE 2023a).
- Habitat constraints and survey requirements listed in the Threatened Biodiversity Data Collection (DPE 2023a).

1.3.2 Habitat Constraints Assessment

The following field-based surveys were undertaken to assess the habitat constraints for the candidate threatened flora species:

- field searches for habitat constraints identified from the desktop review of the TBDC
- direct observation of the quality and suitability of micro-habitats present
- collection of rapid flora assessments for each plant community type to assess the condition of the habitats present
- collection of site photographs to assess the condition of habitats present.

The results of the site-based habitat constraints assessment were utilised to inform the assessment of the confirmed candidate threatened species assessment in the BAMC. Where species presence could not be ruled out in accordance with Section 5.2 of the BAM, surveys were conducted.

1.3.3 Field Surveys

Searches for threatened flora species were completed in accordance with the NSW Survey Guide, 'Surveying threatened plants and their habitats' (DPIE 2020b) and any relevant species requirements listed in the Threatened Biodiversity Data Collection (DPE 2023a). Candidate threatened flora species and field survey methods are detailed in **Table A.3** below and the locations of the surveys completed are mapped in **Figure A.2**.

Table A.3 Candidate Threatened Flora Species Targeted and Field Survey Methods Used

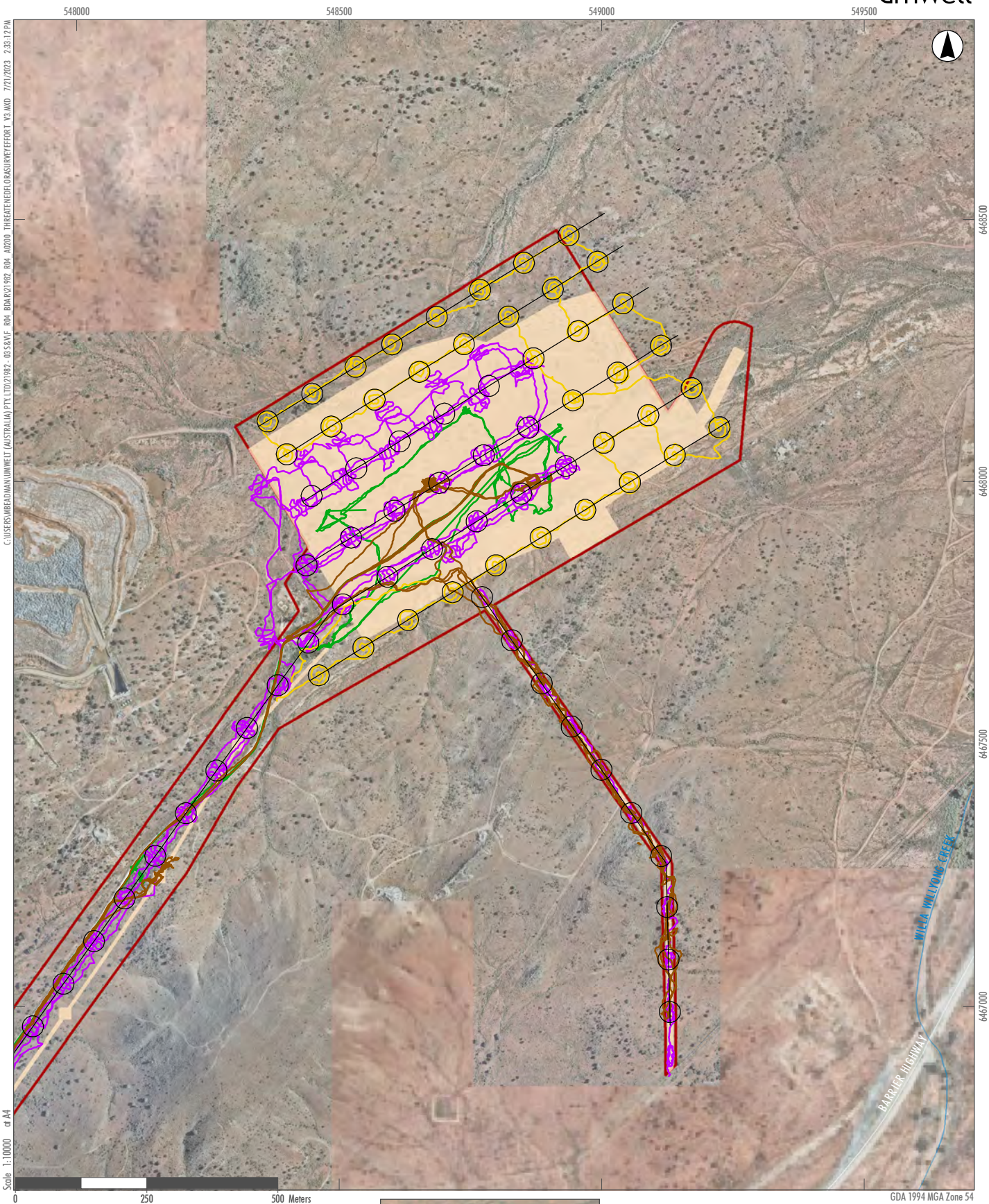
Target Species	Species Survey Period	Survey Dates	Survey Method	Plant Community Type Associations / Areas Surveyed					
				41	123	150	155	136	158
Purple-wood Wattle (*Acacia carneorum*)	All year	May, June & July 2022. September 2022. February 2023.	Opportunistic surveys during vegetation mapping. Large area survey method used. Parallel traverse within 40 m survey circles.	^	^	^	^	^	^
Mallee Golden Wattle *(Acacia notabilis)*	All year	May, June & July 2022. September 2022. February 2023.	Opportunistic surveys during vegetation mapping. Large area survey method used. Parallel traverse within 40 m survey circles	^	x	^	x	x	^
Creek Wattle *(Acacia rivalis)*	All year	May, June & July 2022. September 2022. February 2023.	Opportunistic surveys during vegetation mapping. Large area survey method used. Parallel traverse within 40 m survey circles	x	x	^	^	x	^
Atriplex infrequens	November–February	November 2022. February 2023.	10 m parallel transects across associated PCT and large area survey method used. Parallel traverse within 40 m survey circles	^	^	^	^	x	x
Convolvulus tedmoorei	July–September	September 2022.	Large area survey method used. Parallel traverse within 40 m survey circles	^	^	^	^	^	x

Target Species	Species Survey Period	Survey Dates	Survey Method	Plant Community Type Associations / Areas Surveyed					
				41	123	150	155	136	158
Spike-rush *(Eleocharis obicis)*	October–November	November 2022.	10 m parallel transects across associated PCT and large area survey method used. Parallel traverse within 40 m survey circles	^	^	^	^	x	x
Showy Indigo (*Indigofera longibractea*)	All year	May, June & July 2022. September 2022. February 2023.	Opportunistic surveys during vegetation mapping. Large area survey method used. Parallel traverse within 40 m survey circles	^	x	^	x	x	^
Yellow-Keeled Swainsona *(Swainsona flavicarinata)*	June–October	June & July 2022. September 2022.	Opportunistic surveys during vegetation mapping. Large area survey method used. Parallel traverse within 40 m survey circles	^	^	x	x	^	^
Slender Darling Pea (*Swainsona murrayana*)	September	September 2022.	Large area survey method used. Parallel traverse within 40 m survey circles	^	^	^	x	^	x
Creeping Darling Pea (*Swainsona viridis*)	September–October	September 2022.	Large area survey method used. Parallel traverse within 40 m survey circles	x	x	^	x	^	^

KEY TO SYMBOLS

x = Associated PCT, targeted species survey completed in PCT

^ = Non-associated PCT, opportunistic targeted species survey completed in PCT



Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Summer Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

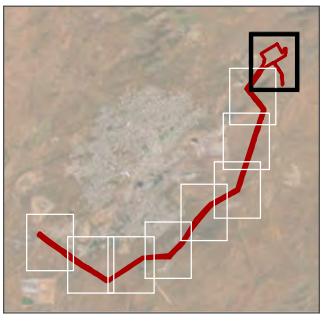


FIGURE A2.A

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

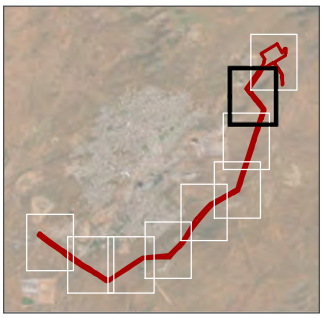
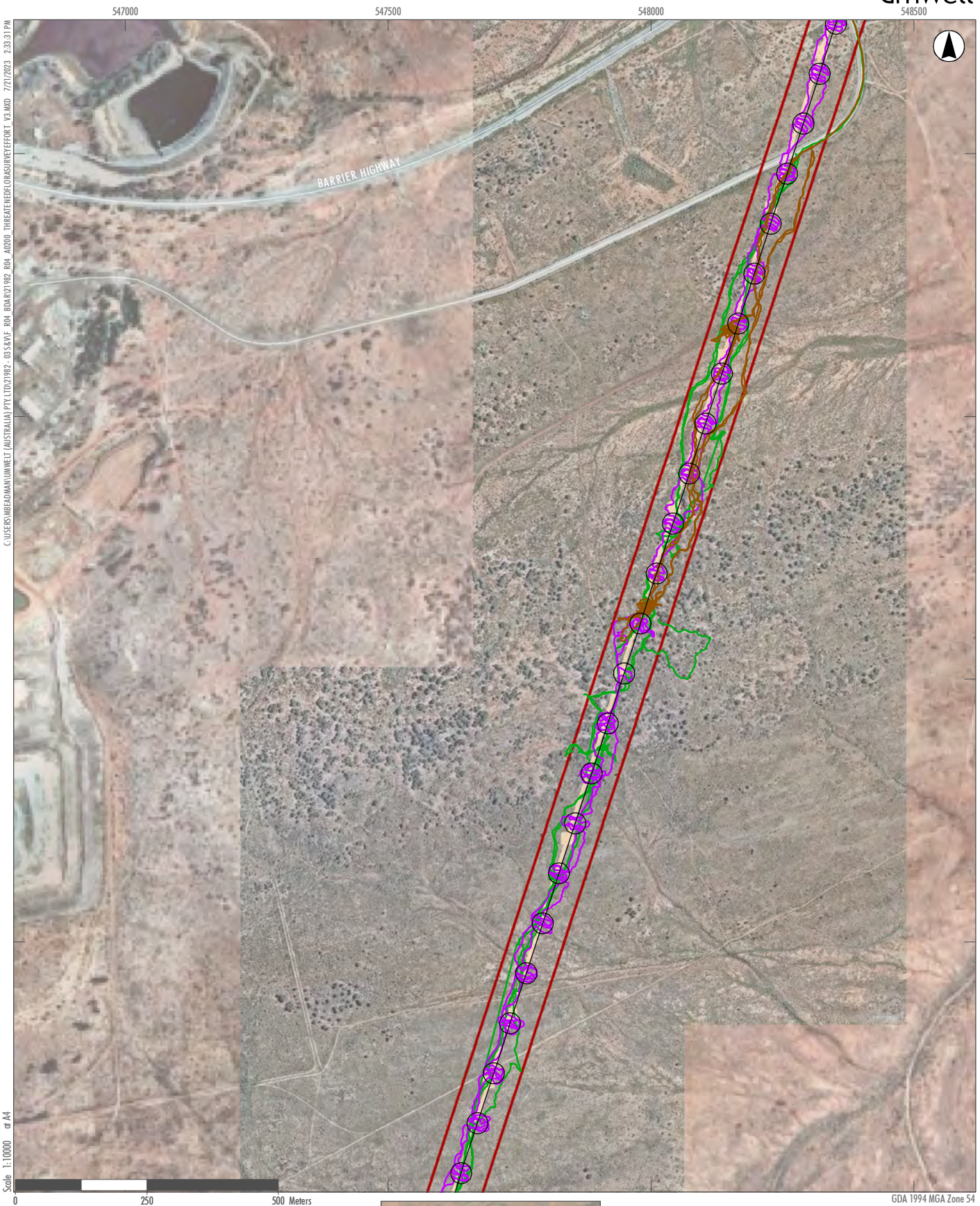


FIGURE A2.B

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

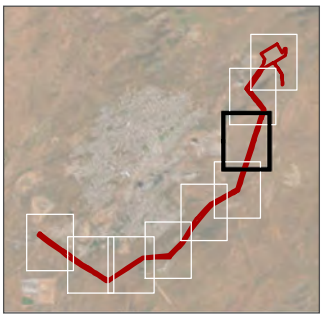
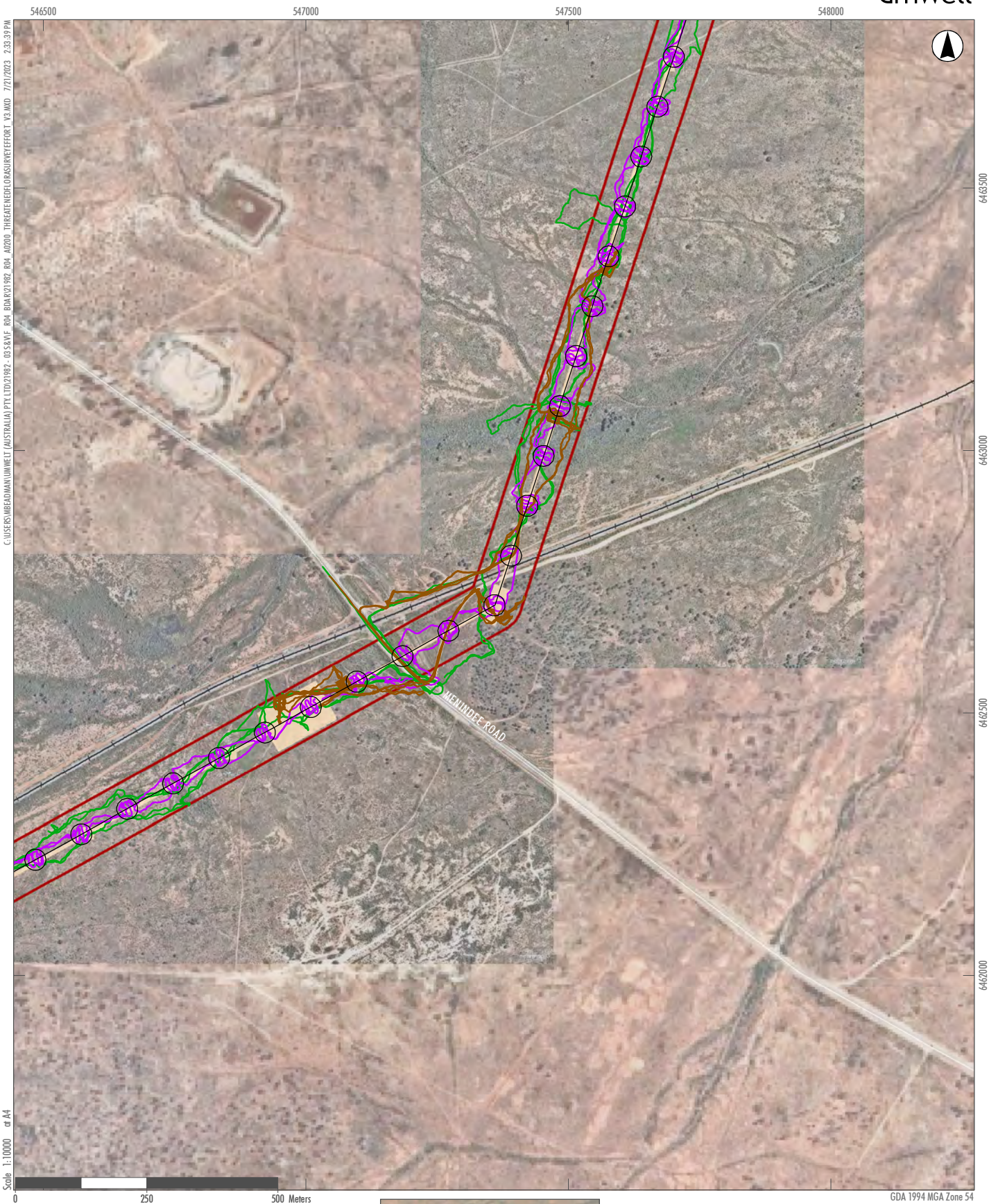


FIGURE A2.C

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

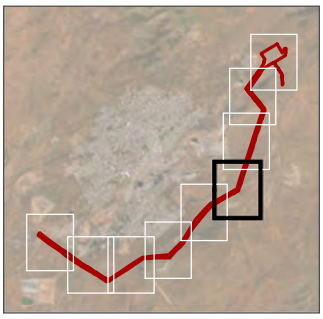


FIGURE A2.D

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

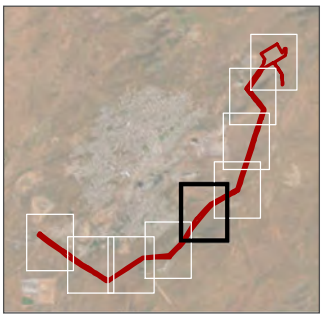
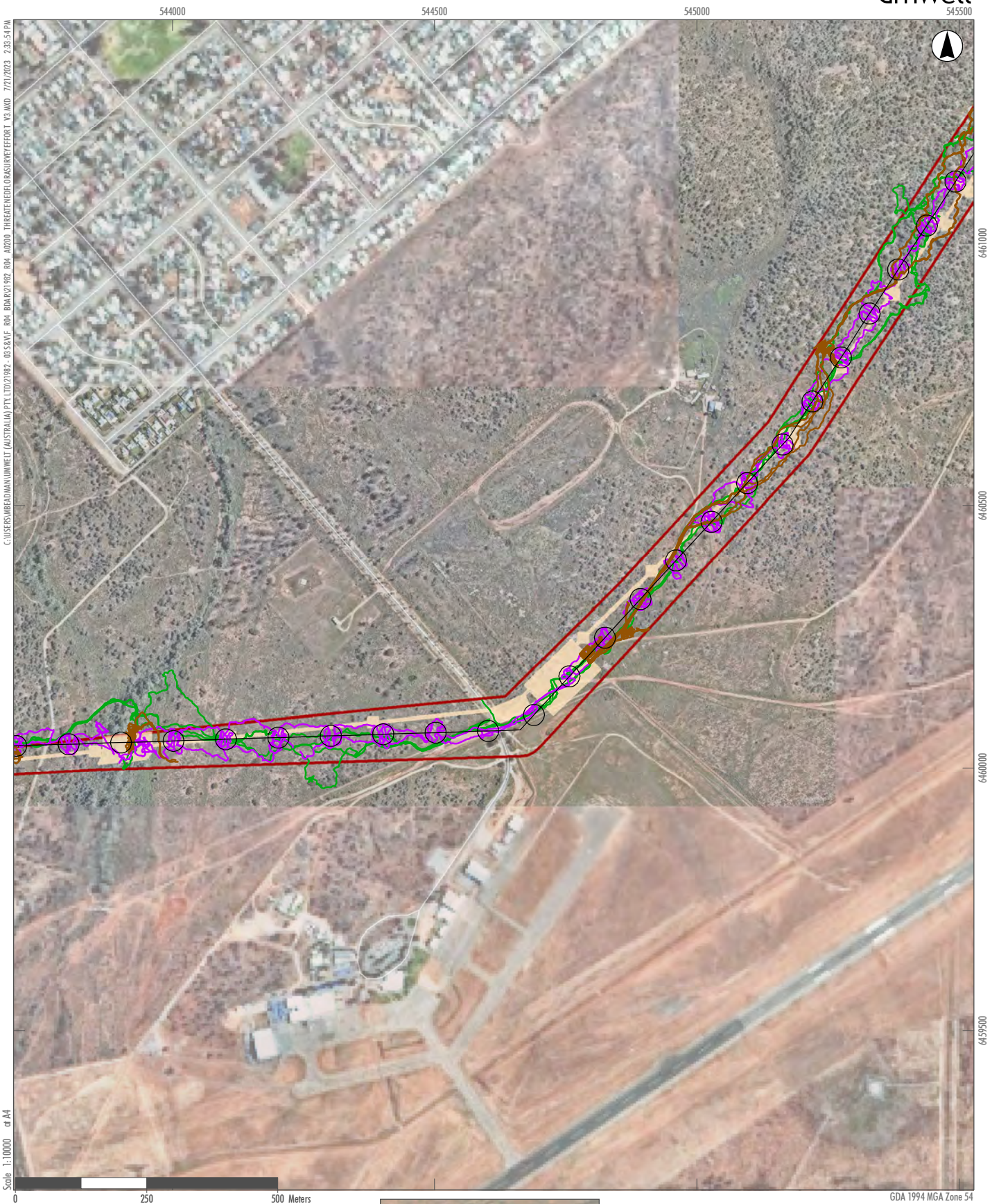


FIGURE A2.E

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

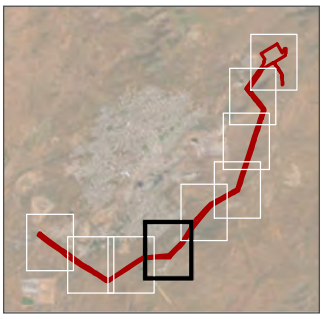
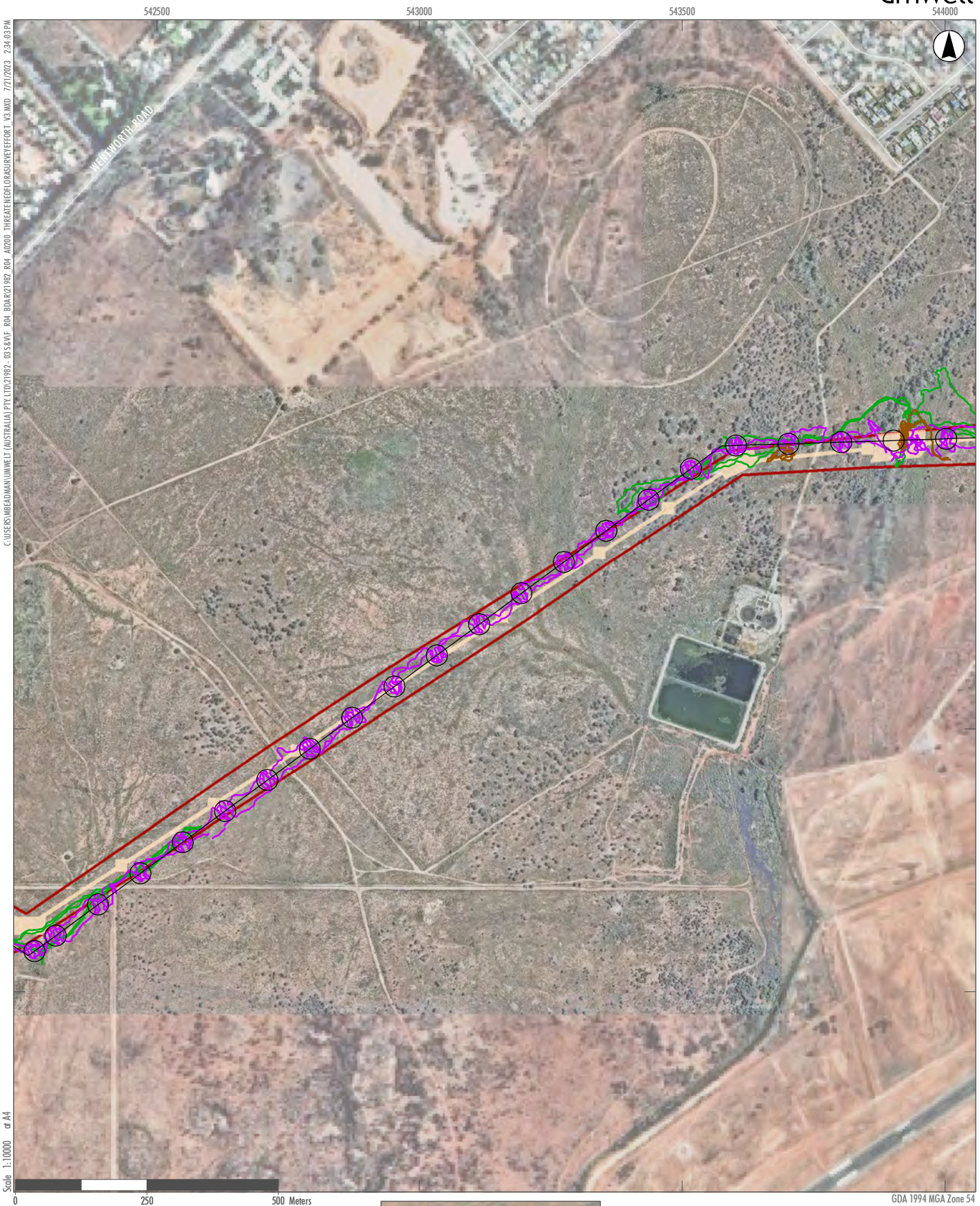


FIGURE A2.F

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

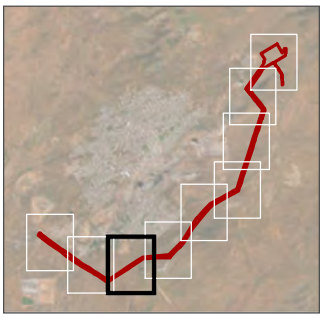


FIGURE A2.G

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

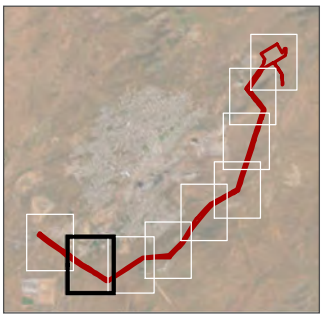
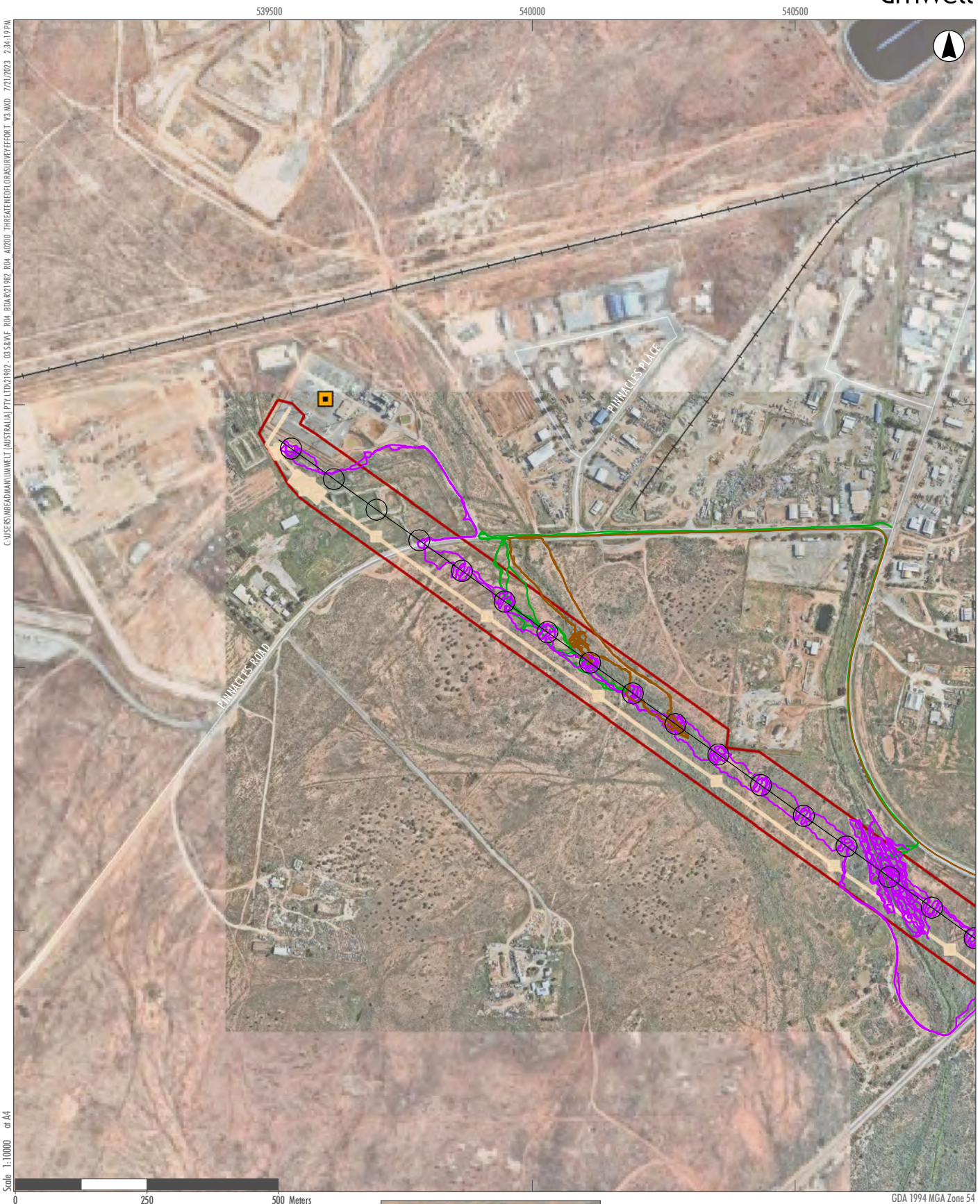


FIGURE A2.H

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



Legend

- Project Area
- Subject Land
- Transgrid Substation
- Grid-based Systematic Survey Approach for Large Areas
- Winter Survey Tracks
- Spring Survey Tracks
- Autumn Survey Tracks

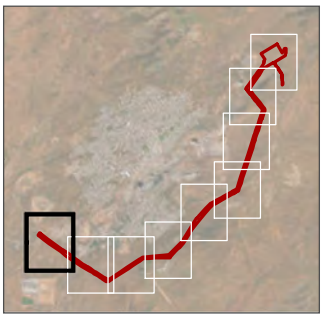


FIGURE A2.1

Targeted Threatened Flora Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

1.4 Threatened Fauna Survey Methods

1.4.1 Review of Existing Information

The following existing information was reviewed to inform the threatened fauna species surveys and assessment of habitat constraints and microhabitats:

- Biodiversity Assessment Method Calculator (BAMC).
- Threatened fauna records held on the NSW BioNet Atlas of NSW Wildlife within and in proximity to the Project Area (DPIE 2023a).
- Vegetation associations reports for the Broken Hill Complex Bioregion and Barrier Range Sub-region for each PCT present to determine threatened fauna species PCT associations.
- Habitat constraints listed in the Threatened Biodiversity Data Collection (TBDC) (DPE 2023a).

1.4.2 Habitat Constraints Assessment

Field-based searches were undertaken to assess the habitat constraints for the candidate threatened fauna species, these searches included observation of habitat constraints identified from the desktop review of the TBDC and recording of the presence, quality and/or suitability of micro-habitats present including:

- hollow bearing trees, particularly those of suitable size for threatened cockatoo and owl breeding habitat
- rocky habitats suitable for reptiles
- outcrops, caves, tunnels and old buildings suitable for threatened microbat species.

The results of the site-based habitat constraints assessment were utilised to inform the assessment of the confirmed candidate threatened species assessment in the BAMC. Where species presence could not be ruled out in accordance with Section 5.2 of the BAM, surveys were conducted.

1.4.3 Field Surveys

Targeted surveys for candidate threatened fauna species were completed with reference to the Threatened Biodiversity Data Collection (DPE 2023a) and the following guidelines:

- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities, NSW Department of Environment and Conservation (DEC 2004).
- Threatened reptiles Biodiversity Assessment Method survey guide, Department of Planning and Environment (DPE 2022d).
- Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act, Department of Sustainability, Environment, Water, Population and Communities (DSEWPC 2011).

- Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act, Department of Sustainability, Environment, Water, Population and Communities (DEWHA 2010a).
- Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act, Department of Sustainability, Environment, Water, Population and Communities (DEWHA 2010b).

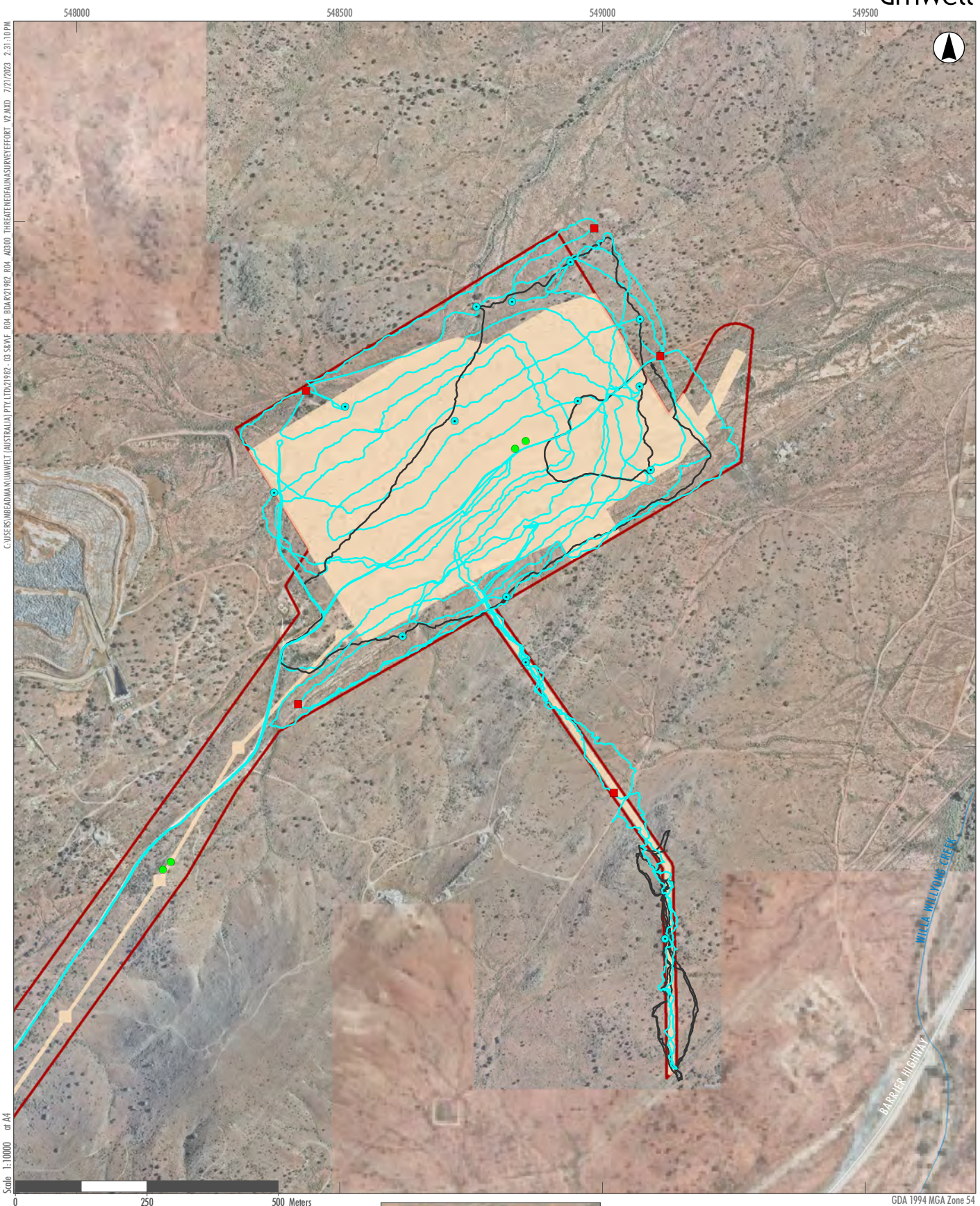
It should be noted that the release of the NSW threatened reptiles survey guideline was in November 2022 however the surveys completed for the project were planned before the release of the guidelines and surveys completed one week after the guidelines were released. Any difference in approach from the surveys completed for threatened reptiles to those identified in the new guidelines are explained by the overlap in timing of the surveys and the release of the guideline.

Details of the field survey methods used and species targeted are listed in **Table A.4** and the locations of the surveys completed are mapped in **Figure A.3**.

Table A.4 Candidate Threatened Fauna Species Targeted and Field Survey Methods Used

Target Species	Survey Period	Survey Dates	Survey Method
Australian bustard ***Ardeotis australis***	All year	February/March, May, June/July, September, November	Diurnal surveys during survey period. Remote detection fauna surveys.
Barrier Range Dragon ***Ctenophorus mirrityana***	October–March	February/March, September-November	Diurnal searches. Pit fall lines completed with reference to relevant guidelines. Remote detection fauna surveys.
Black-breasted Buzzard ***Hamirostra melanosternon***	September–November	February/March, May, June/July, September, November	Diurnal fauna surveys. Opportunistic nest site searches.
Bush Stone-curlew ***Burhinus grallarius***	October–March	February/March, May, June/July, September, November	Diurnal and nocturnal searches / call playback. Remote detection fauna surveys.
Crowned Gecko ***Lucasium stenodactylum***	October–March	February/March, September-November	Nocturnal searches in potential habitat and pit fall lines completed with reference to relevant guidelines. Remote detection fauna surveys.
Eastern Fat-tailed Gecko ***Diplodactylus platyurus***	October–December	February/March, September-November	Nocturnal searches in potential habitat and pit fall lines completed with reference to relevant guidelines. Remote detection fauna surveys.
Little Eagle ***Hieraaetus morphnoides***	August–October	February/March, May, June/July, September, November	Diurnal fauna surveys. Opportunistic nest site searches.
Pink Cockatoo (formerly Major Mitchell's Cockatoo) ***Lophochroa leadbeateri***	September–December	February/March, May, June/July, September, November	Diurnal fauna surveys. Opportunistic nest site searches.
Masked Owl ***Tyto novaehollandiae***	May–July	February/March, May, June/July, September, November	Searches and assessment of potential threatened owl nest trees. Opportunistic hollows searches.
Plains – wanderer ***Pedionomus torquatus***	NA	NA	Site not mapped as important habitat.

Target Species	Survey Period	Survey Dates	Survey Method
Stimson's Python *Antaresia stimsoni*	September–March	February/March, September, November	Nocturnal searches in potential habitat and pit fall lines completed with reference to relevant guidelines. Remote detection fauna surveys.
Square-tailed Kite *Lophoictinia isura*	September–January	February/March, May, June/July, September, November	Diurnal fauna surveys. Opportunistic nest site searches.
Thick-billed Grasswren (north-west NSW subspecies) *Amytornis modestus obscurior*	July–September	February/March, May, June/July, September, November	Diurnal fauna surveys. Opportunistic surveys.



Legend

- Project Area
- Subject Land
- Diurnal Reptile Search
- Nocturnal Surveys
- Trapline
- Remote Camera
- Call Playback

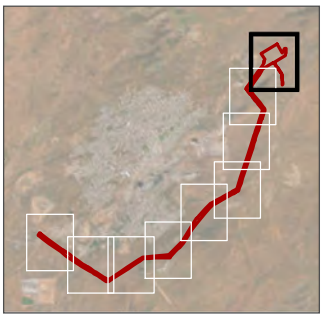
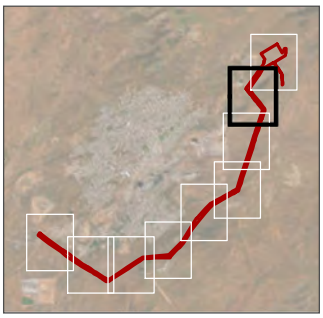


FIGURE A3.A

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)



C:\USERS\MBEADMAN\UMWELT (AUSTRALIA) PTY LTD\21982 - 03 S&VF_ R04_BDAR\21982_R04_A0300_THREATENEDFAUNASURVEYEFFORT_V2.MXD 7/21/2023 2:31:17 PM

Scale 1:10000 at A4

FIGURE A3.B

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

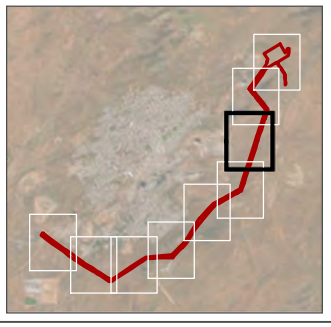


FIGURE A3.C

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Remote Camera

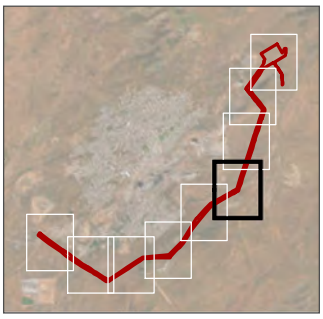


FIGURE A3.D

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Diurnal Reptile Search
- Nocturnal Surveys
- Trapline
- Remote Camera
- Call Playback

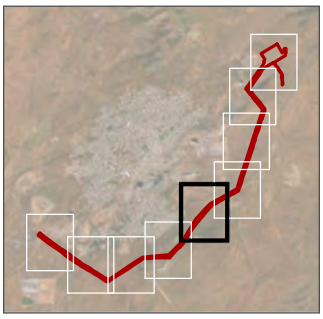


FIGURE A3.E

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

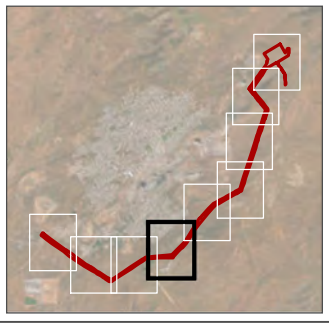


FIGURE A3.F

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Diurnal Reptile Search
- Nocturnal Surveys
- Trapline
- Remote Camera

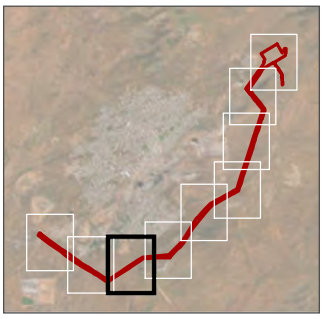


FIGURE A3.G

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

FIGURE A3.H

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

Legend

- Project Area
- Subject Land
- Transgrid Substation
- Diurnal Reptile Search

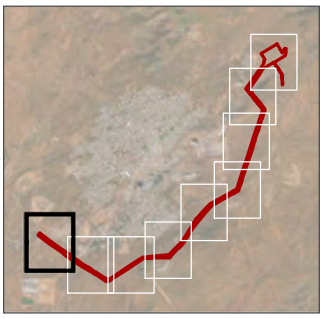


FIGURE A3.1

Targeted Threatened Fauna Survey Effort

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

1.4.3.1 Diurnal Fauna Surveys

The following methods were utilised for targeted diurnal fauna surveys:

Nest site searches for candidate raptor species

Candidate species:

- Australian Bustard (*Ardeotis australis*)
- Black-breasted Buzzard (*Hamirostra melanosternon*)
- Little eagle (*Hieraaetus morphnoides*)
- Square-tailed kite (*Lophoictinia isura*).

Targeted and opportunistic bird of prey nest searches were undertaken across the Project. Suitable nest trees and stags were inspected for large nests.

Opportunistic searches were undertaken concurrently during all biodiversity survey effort across the Project. No large stick nests were recorded as part of surveys.

Searches for threatened cockatoo feeding and breeding trees

Candidate cockatoo species:

- Pink Cockatoo (*Lophochroa leadbeateri*).
- Targeted and opportunistic searches for threatened cockatoo feeding and breeding sites were undertaken across the Project. Opportunistic searches were undertaken concurrently during all biodiversity survey effort across the Project. No hollow bearing trees were recorded as part of surveys.

Searches and assessment of potential threatened owl nest trees

Candidate owl species:

- Masted Owl (*Tyto novaehollandiae*).

Targeted and opportunistic searches for hollow bearing trees with hollows greater than 20 cm in diameter were undertaken across the Project. No hollow bearing trees were recorded as part of surveys.

Opportunistic observation

Opportunistic searches were undertaken concurrently during all biodiversity survey effort across the Project.

Targeted searches for diurnal reptiles – Pitfall and funnel traps

Pitfall and funnel trapping was undertaken. The survey effort is detailed in **Table A.4**, survey locations are mapped in **Figure A.3**. The following threatened species were targeted using this method:

- Barrier range dragon (*Ctenophorus mirrityana*)
- Crowned Gecko (*Lucasium stenodactylum*)

- Eastern Fat-tailed Gecko (*Diplodactylus platyurus*)
- Stimson's Python (*Antaresia stimsoni*).

Rock flipping for threatened reptile species

Opportunistic rock and log flipping and habitat searches was undertaken across the Project. Suitable rocks and logs were inspected for the following target reptile species:

- Barrier range dragon (*Ctenophorus mirrityana*).

1.4.3.2 Nocturnal Fauna Surveys

Call playback and spotlighting

Nocturnal call playback surveys were undertaken targeting Bush Stone-curlew (*Burhinus grallarius*). Each survey would be undertaken by a pair of observers experienced in identifying nocturnal birds and their calls. Species calls were broadcast using a 15-watt directional loud hailer for approximately four minutes.

Each survey would comprise the following:

- 10-minute listening period
- Bush Stone-curlew (*Burhinus grallarius*) call playback– 2 mins
- Silence – 2 mins
- Bush Stone-curlew (*Burhinus grallarius*) call playback– 2 mins
- Silence – 2 mins
- Bush Stone-curlew (*Burhinus grallarius*) call playback– 2 mins
- Silence – 2 mins.

Following call playback sessions, nocturnal spotlighting searches were conducted at each site. This involved walking a meandering transect and recording any fauna species seen or heard calling. Species were visually identified using 10 x 40 magnification binoculars or by call recognition. The survey effort is detailed in **Table A.5**, survey locations are mapped in **Figure A.3**.

Table A.5 Details of Nocturnal Threatened Fauna Surveys Completed

Species Targeted	Survey Date	Survey Methods	Weather conditions	Survey Effort / Time
Bush Stone-curlew (*Burhinus grallarius*)	21–25 November 2022, 27 February–2 March 2023	Diurnal and nocturnal searches / call playback	Refer to **Section 1.6**	Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights) Call play back
Crowned Gecko (*Lucasium stenodactylum*)	21–25 November 2022, 27 February–2 March 2023	Nocturnal searches in potential habitat and pit fall lines completed with reference to relevant guidelines.	Refer to **Section 1.6**	Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights). Traps: 3 x pitfall, 3 x funnel, 4 trap nights.
Eastern Fat-tailed Gecko (*Diplodactylus platyurus*)	21–25 November 2022, 27 February–2 March 2023	Nocturnal searches in potential habitat and pit fall lines completed with reference to relevant guidelines.	Refer to **Section 1.6**	Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights). Traps: 3 x pitfall traps, 3 x funnel traps, 4 trap nights.
Stimson's Python (*Antaresia stimsoni*)	21–25 November 2022, 27 February–2 March 2023	Nocturnal searches in potential habitat and pit fall/funnel lines completed with reference to relevant guidelines.	Refer to **Section 1.6**	Nocturnal surveys: 8 survey nights ~ 2 x hours per night (2 x ecologists x 4 nights, 1 x ecologist 4 nights). Traps: 3 x pitfall, 3 x funnel, 4 trap nights.

1.4.3.3 Remote Detection Fauna Surveys

Remote cameras were deployed in suitable areas across the Project, in order to determine the presence of the following species:

- Australian bustard (*Ardeotis australis*)
- Barrier Range Dragon (*Ctenophorus mirrityana*)
- Bush Stone-curlew (*Burhinus grallarius*)
- Crowned Gecko (Lucasium stenodactylum)
- Eastern Fat-tailed Gecko (*Diplodactylus platyurus*)
- Stimson's Python (*Antaresia stimsoni*).

Umwelt utilised various camera models throughout the course of remote camera surveys, including, Bushnell Trophy Cam HD, Swift Enduro, Reconyx and Nextech.

Remote cameras were ground based, mounted on tree trunks <1 m above the ground, where possible. Remote cameras were set to both day and night mode, when movement was detected, three photos were captured in quick succession.

The survey effort is detailed in **Table A.6**, survey locations are mapped in **Figure A.3**.

Table A.6 Details of Remote Detection Threatened Fauna Surveys Completed

Species Targeted	Survey Date	Survey Methods	Weather conditions	Survey Effort/Time
Australian bustard (*Ardeotis australis*)	27 February–3 March 2023 18 September– 22 November 2022	Ground based remote camera surveys.	Refer to **Section 1.6**	10 cameras x 66 nights & 10 cameras x 7 nights.
Barrier Range Dragon (*Ctenophorus mirrityana*)	27 February–3 March 2023 18 September– 22 November 2022	Ground based remote camera surveys.	Refer to **Section 1.6**	10 cameras x 66 nights & 10 cameras x 7 nights.
Bush Stone-curlew (*Burhinus grallarius*)	27 February–3 March 2023 18 September– 22 November 2022	Ground based remote camera surveys.	Refer to **Section 1.6**	10 cameras x 66 nights & 10 cameras x 7 nights.
Crowned Gecko (*Lucasium stenodactylum*)	27 February–3 March 2023 18 September– 22 November 2022	Ground based remote camera surveys.	Refer to **Section 1.6**	10 cameras x 66 nights & 10 cameras x 7 nights.
Eastern Fat-tailed Gecko (*Diplodactylus platyurus*)	27 February–3 March 2023 18 September– 22 November 2022	Ground based remote camera surveys.	Refer to **Section 1.6**	10 cameras x 66 nights & 10 cameras x 7 nights.
Stimson's Python (*Antaresia stimsoni*)	27 February–3 March 2023 18 September– 22 November 2022	Ground based remote camera surveys.	Refer to **Section 1.6**	10 cameras x 66 nights & 10 cameras x 7 nights.

1.5 Threatened Fungi

No threatened fungi species were identified as predicted or candidate threatened species.

1.6 Weather Conditions

The weather conditions during all biodiversity surveys for the project are presented below in **Table A.6**. Data is derived from the Broken Hill Airport AWS weather station (047048) from the Bureau of Meteorology (2023). This weather station is located approximately 3.9 km from the Broken Hill Township, this station was chosen as it provided consistent recordings of the relevant weather readings.

Weather conditions experienced during surveys are considered to be appropriate to ensure the detection of target species-credit species.

Table A.7 Weather Conditions During Biodiversity Surveys

Date	Daily Data			Monthly Data		
	Min-Max Temp(°C)	Rainfall (mm)	Relative Humidity (%)	Min-Max Temp (°C) (mean)	Rainfall (mm) (total)	Relative Humidity (%) (mean)
16/05/2022	8.6–19.4	0	72	Min: 3.2 Max: 21.5	23.8	78
17/05/2022	6.2–17.4	0	75			
18/05/2022	6.8–16.4	0	86			
19/05/2022	7.0–13.3	0	79			
20/05/2022	6.7–13.7	0	83			
27/06/2022	5.0–13.0	0	93	Min: 0.0 Max: 19.3	2.2	75
28/06/2022	0.0–13.9	0	70			
29/06/2022	3.4–13.6	0	64			
30/06/2022	3.3–14.9	0	69			
01/07/2022	2.7–12.3	0	93			
26/09/2022	14.5–22.4	0	73	Min: 2.3 Max: 26.5	55.2	65
27/09/2022	7.5–18.0	0.2	55			
28/09/2022	7.8–18.2	0	82			
29/09/2022	6.6–19.1	0	73			
30/09/2022	5.4–19.1	0	73			
21/11/2022	10.5–19.9	0	50	Min: 5.1 Max: 34.3	34.0	18.1
22/11/2022	5.1–21.6	0	56			
23/11/2022	8.4–24.8	0	57			
24/11/2022	11.8–28.0	0	42			
25/11/2022	14.8–30.3	0	34			

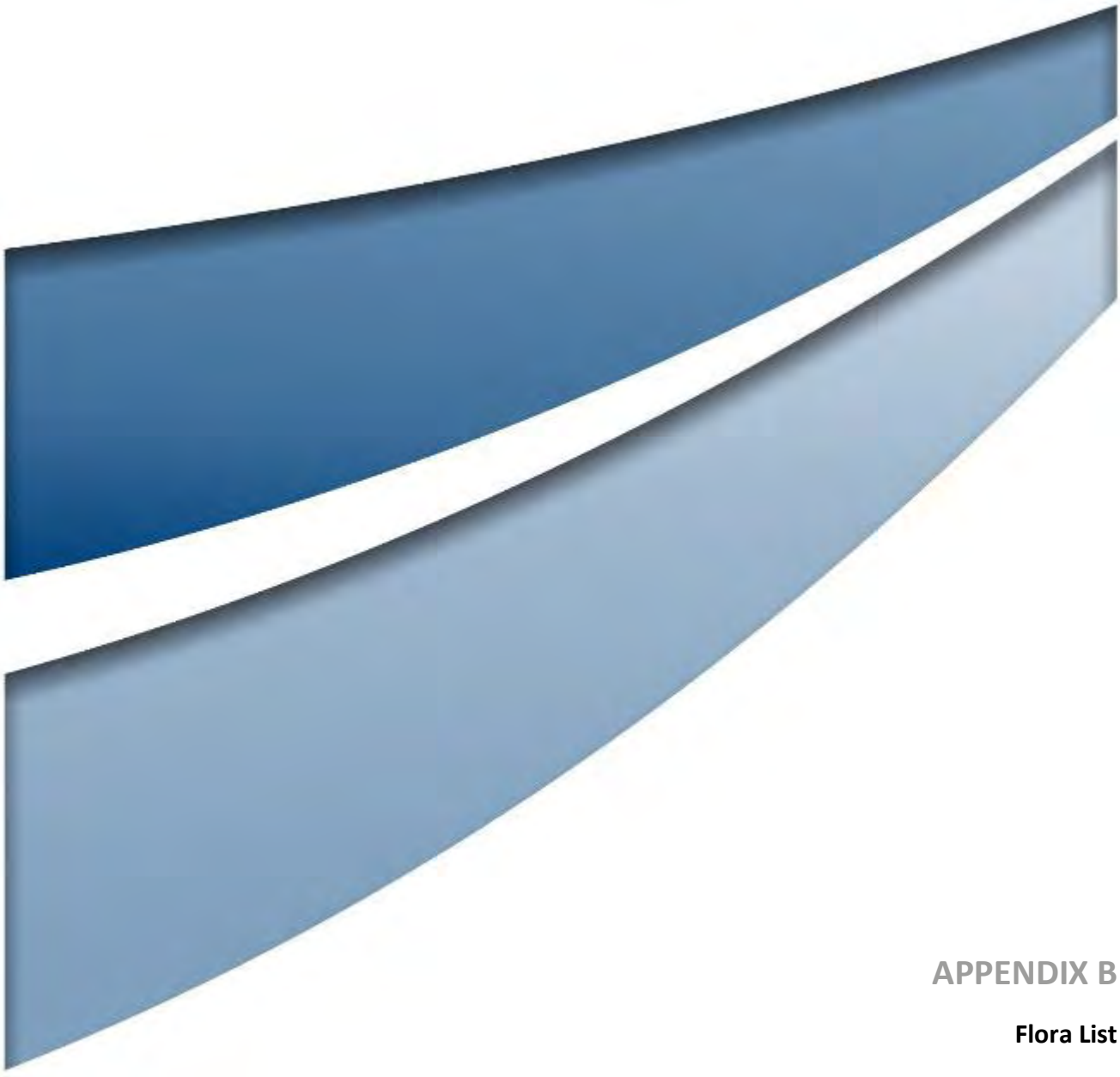
Date	Daily Data			Monthly Data		
	Min-Max Temp(°C)	Rainfall (mm)	Relative Humidity (%)	Min-Max Temp (°C) (mean)	Rainfall (mm) (total)	Relative Humidity (%) (mean)
27/02/2023	15.7–33.5	0	50	Feb- Min: 7.7 Max: 42.3 Mar- Min: 8.7 Max: 41.1	Feb – 0.0 Mar – 3.0	Feb – 39 Mar–50
28/02/2023	15.9–34.6	0	40			
01/03/2023	14.0–27.1	0	57			
02/03/2023	12.3–28.9	0	61			
03/03/2023	13.1–30.3	0	57			

1.7 Limitations

The surveys completed were undertaken during the appropriate seasons specified within the Threatened Biodiversity Data Collection to maximise the probability of detection. However, due to alterations in disturbance boundaries, some areas (SCES Facility) were not surveyed before finalisation of this BDAR. As a result, these species have been assumed present within those portions of the Subject Land, targeted surveys are proposed for Spring 2023, ideally during the Response to Submissions phase. Given the small area of potentially suitable habitat, a single individual for species by count (*Acacia notabilis* and *Acacia rivalis*) has been entered in the BAM calculator.

As the request of BCD, the SCES Facility (site based) and Transmission Line (linear development) were assessed separately in the BAM calculator. The additional vegetation integrity plots sampled in March 2023 in the SCES Facility were notably sampled at a drier period to the plots sampled in June/July 2023 and this may have impacted vegetation integrity scores due to seasonal differences.

As with all biodiversity surveys, there are inherent limitations of time, weather and location and the biodiversity surveys completed for this project form a point in time sample. Whilst surveys have been completed in accordance with the BAM and all applicable survey guidelines available at the time of survey, the results still represent a sample of the diversity. It should be noted that the release of the NSW threatened reptiles survey guideline was in November 2022 however the surveys completed for the Project were planned before the release of the guidelines and surveys completed one week after the guidelines were released. Any difference in approach from the surveys completed for threatened reptiles to those identified in the new guidelines are explained by the overlap in timing of the surveys and the release of the guideline.



APPENDIX B

Flora List

Appendix B Flora Species List

The following abbreviations or symbols are used in the list:

TG = Tree

SG = Shrub

FG = Forb

EG = Fern

GG = Grass & grasslike

OG = Other

HTW = High threat weed

EX = Exotic species

subsp. = subspecies

var. = variety

sp. = specimens identified to genus level only

Table B.1 Floristic Data Vegetation Zones 1–5

Family	Species Name	Common Name	Growth Form	P21982_021		P21982_019		P21982_006		P21982_011		P21982_004		P21982_008		P21982_016		P21982_017	
				VZ_1		VZ_2		VZ_3		VZ_4		VZ_5		VZ_5		VZ_5		VZ_5	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Aizoaceae	*Galenia pubescens*	Galenia	HTW	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Mesembryanthemum nodiflorum*	Small Ice Plant	EX	0	0	0	0	0.1	3	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Sarcozona praecox*	Sarcozona	FG	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Tetragonia moorei*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Tetragonia tetragonoides*	New Zealand Spinach	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Trianthema triquetra*	Small Hogweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amaranthaceae	*Ptilotus obovatus*	Smoke Bush	SG	0	0	0	0	0	0	0	0	0.5	20	1	50	0.1	1	0.2	2
Anacardiaceae	*Searsia lancea*	African Sumac	EX	0	0	2	10	0	0	0	0	0	0	0	0	0	0	0	0
Apiaceae	*Daucus glochidiatus*	Native Carrot	FG	0.2	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apocynaceae	*Marsdenia australis*	Doubah	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asphodelaceae	*Asphodelus fistulosus*	Onion Weed	EX	0	0	0	0	1	50	2	100	0	0	0	0	0	0	0	0
Asteraceae	*Brachyscome ciliaris*	Variable Daisy	FG	0.2	10	0	0	0.2	50	0.5	50	0	0	0	0	0	0	0	0
Asteraceae	*Calotis hispidula*	Bogan Flea	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Asteraceae	*Calotis* sp.		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Chrysanthemoides monilifera subsp. monilifera*	Boneseed	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Chrysocephalum apiculatum*	Common Everlasting	FG	0	0	0	0	5	100	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	EX	0	0	30	1000	0	0	0	0	0	0	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_021		P21982_019		P21982_006		P21982_011		P21982_004		P21982_008		P21982_016		P21982_017	
				VZ_1		VZ_2		VZ_3		VZ_4		VZ_5		VZ_5		VZ_5		VZ_5	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Asteraceae	*Conyza sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Dimorphotheca ecklonis*	Cape Daisy	EX	0	0	5	50	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Euchiton sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Helianthus annuus*	Common Sunflower	EX	0	0	0	0	0.5	5	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Hypochaeris sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Lactuca serriola*	Prickly Lettuce	EX	0	0	0	0	0.1	5	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Leiocarpa tomentosa*	Woolly Plover-daisy	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0
Asteraceae	*Leiocarpa websteri*		FG	0.5	10	0	0	0.5	50	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Minuria cunninghamii*	Bush Minuria	FG	0.3	5	0	0	0.2	20	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Olearia pimeleoides*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Rhodanthe moschata*		FG	0	0	0	0	0	0	0	0	0	0	2	100	5	100	3	500
Asteraceae	*Senecio cunninghamii*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Senecio quadridentatus*	Cotton Fireweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	EX	0.5	20	0.5	20	1	100	0	0	0	0	0.1	10	0	0	0	0
Asteraceae	*Vittadinia cuneata*		FG	0.2	2	0	0	0	0	0	0	0	0	0.1	1	0.2	5	0	0
Asteraceae	*Vittadinia eremaea*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Xanthium occidentale*	Noogoora Burr	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Xanthium sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boraginaceae	*Echium plantagineum*	Patterson's Curse	EX	0	0	0	0	0	0	0	0	0	0	0.1	5	3	50	1	20
Brassicaceae	*Arabidella trisecta*		SG	0	0	0	0	0	0	0.2	10	0.5	20	0.5	20	0	0	0	0
Brassicaceae	*Carrichtera annua*	Ward's Weed	HTW	10	10	0	0	0.5	20	1	100	0.5	50	0.2	20	2	100	5	500
Brassicaceae	*Harmsiodoxa blennodioides*		FG	0	0	0	0	0	0	0	0	0	0	0.1	1	3	100	5	100
Brassicaceae	*Lepidium africanum*	Common Peppercress	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Lepidium phlebopetalum*	Veined Peppercress	FG	0	0	0	0	0	0	0.1	1	0	0	0.1	1	0	0	0	0
Brassicaceae	*Sisymbrium erysimoides*	Smooth Mustard	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Sisymbrium irio*	London Rocket	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campanulaceae	*Isotoma petraea*	Rock Isotome	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex angulata*	Fan Saltbush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex conduplicata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex holocarpa*	Pop Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex limbata*		FG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex lindleyi*	Eastern Flat-top Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex nummularia*	Old Man Saltbush	SG	5	10	0.5	2	20	50	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex stipitata*	Mallee Saltbush	SG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex vesicaria*	Bladder Saltbush	SG	0	0	0	0	0.5	20	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Chenopodium cristatum*	Crested Goosefoot	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Chenopodiaceae	*Chenopodium desertorum*	Desert Goosefoot	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_021		P21982_019		P21982_006		P21982_011		P21982_004		P21982_008		P21982_016		P21982_017	
				VZ_1		VZ_2		VZ_3		VZ_4		VZ_5		VZ_5		VZ_5		VZ_5	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Chenopodiaceae	*Dissocarpus biflorus var. biflorus*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Dissocarpus paradoxus*	Cannonball Burr	SG	0.4	2	0	0	0	0	0	0	0	0	0.2	5	0	0	0	0
Chenopodiaceae	*Dysphania cristata*	Crested Crumbweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	SG	1	5	0	0	0	0	0.5	2	1	10	0.2	2	0	0	0	0
Chenopodiaceae	*Maireana brevifolia*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana decalvans*	Black Cotton Bush	SG	0	0	0	0	0	0	5	20	0	0	0.1	1	0	0	0	0
Chenopodiaceae	*Maireana georgei*	Slit-wing Bluebush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana integra*		SG	0.3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana pyramidata*	Black Bluebush	SG	10	20	0	0	0	0	0.5	1	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana sclerolaenoides*		SG	0	0	0	0	0	0	0	0	1	50	0	0	0	0	0	0
Chenopodiaceae	*Maireana sedifolia*	Pearl Bluebush	SG	0	0	0	0	0	0	0	0	0.5	6	0	0	0	0	0	0
Chenopodiaceae	*Maireana sp.*	Cotton Bush, Bluebush, Fissure-weed	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana triptera*	Three-wing Bluebush	SG	0	0	0	0	0	0	0	0	0.5	10	0.5	10	0	0	3	10
Chenopodiaceae	*Osteocarpum acropterum var. deminutum*	Bonefruit	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Rhagodia spinescens*	Thorny Saltbush	SG	5	20	5	20	0.1	1	1	10	0	0	0.2	2	0	0	0	0
Chenopodiaceae	*Salsola australis*		SG	0.2	5	0	0	0	0	0.5	20	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena brachyptera*	Short-winged Copperburr	SG	0	0	0	0	0.1	5	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena diacantha*	Grey Copperburr	SG	1	10	0	0	0.1	1	0	0	0	0	1	20	0	0	0.1	1
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena eriacantha*	Silky Copperburr	SG	0	0	0	0	0	0	0.5	5	20	500	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena lanicuspis*	Woolly Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena limbata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena obliquicuspis*		SG	0	0	0	0	0	0	10	30	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena tricuspis*	Giant Redburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena ventricosa*	Salt Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulaceae	*Convolvulus remotus*		OG	1	20	0.2	5	0	0	0.1	2	0	0	0.1	1	0	0	0	0
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	20	0.2	40
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	Paddy Melon	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyperaceae	*Cyperus gymnocaulos*		GG	0	0	0	0	5	50	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia peplus*	Petty Spurge	EX	0	0	0.2	10	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	5
Euphorbiaceae	*Ricinus communis*	Castor Oil Plant	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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				VZ_1		VZ_2		VZ_3		VZ_4		VZ_5		VZ_5		VZ_5		VZ_5	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Fabaceae (Caesalpinioideae)	*Senna artemisioides*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides <--> zygophylla*		SG	3	3	20	50	0	0	0.5	3	0	0	15	100	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. filifolia*		SG	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. X artemisioides*		SG	0	0	0	0	0	0	0	0	0	0	0	0	1	10	5	20
Fabaceae (Faboideae)	*Cullen cinereum*	Annual Verbine	FG	0	0	0	0	0.1	2	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Glycine canescens*	Silky Glycine	OG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0
Fabaceae (Faboideae)	*Lotus australis*	Australian Trefoil	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Lotus cruentus*	Red-flowered Lotus	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	EX	10	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago sp.*		EX	0	0	0.5	20	5	100	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Swainsona fissimontana*		FG	0	0	0	0	0	0	0	0	0	0	0.1	2	0	0	0	0
Fabaceae (Faboideae)	*Swainsona formosa*	Sturt's Desert Pea	FG	0	0	0	0	0	0	0.5	5	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Vicia monantha*	Square-stemmed Vetch	EX	5	20	0	0	1	20	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia aneura*	Mulga	SG	0	0	5	10	0	0	2	4	5	1	5	10	15	6	15	4
Fabaceae (Mimosoideae)	*Acacia brachystachya*	Umbrella Mulga	SG	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	1	1
Fabaceae (Mimosoideae)	*Acacia oswaldii*	Miljee	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia salicina*	Cooba	TG	10	5	15	20	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia tetragonophylla*	Dead Finish	SG	0	0	0	0	0	0	0.5	1	15	20	5	2	0	0	5	3
Fabaceae (Mimosoideae)	*Acacia victoriae*		SG	0.5	1	0.2	1	10	10	0	0	0	0	0.5	2	0	0	0	0
Fabaceae (Mimosoideae)	*Prosopis velutina*	Velvet Mesquite	HTW	0.2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fumariaceae	*Fumaria capreolata*	Climbing Fumitory	EX	0	0	30	500	0	0	0	0	0	0	0	0	0	0	0	0
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia berardiana*		FG	0.1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0
Goodeniaceae	*Scaevola spinescens*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lamiaceae	*Prostanthera striatiflora*	Jockey's Cap	SG	0	0	0	0	0	0	0	0	0	0	0	0	5	20	0	0
Lamiaceae	*Salvia sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loranthaceae	*Amyema maidenii*		OG	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0
Malvaceae	*Abutilon fraseri*	Dwarf Lantern-flower	FG	0	0	0	0	0	0	0	0	0.5	10	0	0	0	0	0	0
Malvaceae	*Abutilon halophilum*		SG	0.1	1	0	0	0	0	0.1	1	0	0	0	0	0	0	0.1	1

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				VZ_1		VZ_2		VZ_3		VZ_4		VZ_5		VZ_5		VZ_5		VZ_5	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Malvaceae	*Hibiscus sturtii*	Hill Hibiscus	FG	0.1	1	0	0	0	0	0	0	0	0	0	0	0.2	5	0.2	5
Malvaceae	*Malva parviflora*	Small-flowered Mallow	EX	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Malvastrum americanum*	Spiked Malvastrum	EX	0.5	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Sida corrugata*	Corrugated Sida	FG	0	0	0	0	0	0	0	0	0.2	10	0	0	0	0	0	0
Malvaceae	*Sida fibulifera*	Pin Sida	FG	10	100	0	0	0	0	0.2	10	0	0	0.1	2	0	0	0	0
Malvaceae	*Sida intricata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Sida petrophila*		SG	0	0	0	0	0	0	0	0	1	20	0.1	2	0	0	0	0
Meliaceae	*Melia azedarach*	White Cedar	TG	0	0	0.5	2	0	0	0	0	0	0	0	0	0	0	0	0
Myoporaceae	*Eremophila serrulata*	Green Fuchsia Bush	SG	0	0	0	0	0	0	0	0	0.5	5	0	0	0.5	2	0.1	1
Myoporaceae	*Myoporum montanum*	Western Boobialla	SG	0.5	10	0.5	2	2	4	0	0	0	0	0	0	0	0	0	0
Myrtaceae	*Eucalyptus camaldulensis*	River Red Gum	TG	0	0	30	5	10	4	0	0	0	0	0	0	0	0	0	0
Nyctaginaceae	*Boerhavia dominii*	Tarvine	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oxalidaceae	*Oxalis perennans*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plantaginaceae	*Plantago cunninghamii*	Sago-weed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plantaginaceae	*Plantago sp.*	Plantain	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium lobatum*	Winged Sea Lavender	EX	0	0	0	0	10	100	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium sinuatum*	Perennial Sea Lavender	EX	0	0	0.2	2	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Aristida contorta*	Bunched Kerosene Grass	GG	0	0	0	0	0	0	0	0	1	50	10	50	0	0	0.1	1
Poaceae	*Aristida personata*		GG	0.5	5	0	0	5	100	0	0	0	0	0	0	0	0	0	0
Poaceae	*Arundo donax*	Giant Reed	HTW	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Austrostipa nitida*		GG	20	50	0	0	5	50	60	500	5	100	10	100	15	500	40	1000
Poaceae	*Austrostipa nodosa*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Chloris gayana*	Rhodes Grass	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Cymbopogon ambiguus*	Lemon Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Cynodon dactylon*	Common Couch	GG	0	0	5	20	0.5	1	0	0	0	0	0	0	0	0	0	0
Poaceae	*Dactyloctenium radulans*	Button Grass	GG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Dichanthium sericeum subsp. sericeum*	Queensland Bluegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Digitaria brownii*	Cotton Panic Grass	GG	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0.1	1
Poaceae	*Digitaria coenicola*	Finger Panic Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enneapogon avenaceus*	Bottle Washers	GG	5	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enneapogon intermedius*		GG	0	0	0	0	0.1	1	5	100	5	100	1	50	0.1	1	5	100
Poaceae	*Enneapogon sp.*	Nineawn Grass, Bottlewashers	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis cilianensis*	Stinkgrass	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis dielsii*	Mallee Lovegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	GG	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis sp.*		GG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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				VZ_1		VZ_2		VZ_3		VZ_4		VZ_5		VZ_5		VZ_5		VZ_5	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0.5	10	0	0
Poaceae	*Piptatherum miliaceum*	Rice Millet	EX	0	0	2	2	1	20	0	0	0	0	0	0	0	0	0	0
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	GG	0.2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Sporobolus caroli*	Fairy Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Thyridolepis mitchelliana*	Mulga Mitchell Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	10	100	0.5	10
Polygonaceae	*Rumex crispus*	Curled Dock	EX	0	0	5	50	0	0	0	0	0	0	0	0	0	0	0	0
Polygonaceae	*Rumex vesicarius*	Bladder Dock	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portulacaceae	*Portulaca oleracea*	Pigweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portulacaceae	*Portulaca sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	EX	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Pteridaceae	*Cheilanthes lasiophylla*		EG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	3	0	0
Pteridaceae	*Cheilanthes sieberi subsp. sieberi*	Rock Fern	EG	0	0	0	0	0	0	0	0	0	0	0	0	0.5	20	0	0
Rubiaceae	*Galium aparine*	Goosegrass	EX	0	0	0.1	2	0	0	0	0	0	0	0	0	0	0	0	0
Santalaceae	*Santalum acuminatum*	Sweet Quandong	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sapindaceae	*Dodonaea lobulata*		SG	0	0	0	0	0	0	0	0	0.2	2	0	0	0	0	0	0
Sapindaceae	*Dodonaea viscosa subsp. angustissima*	Narrow-leaf Hop-bush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Lycium australe*	Australian Boxthorn	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Lycium ferocissimum*	African Boxthorn	HTW	0	0	0.5	1	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum ellipticum*	Velvet Potato Bush	FG	0	0	0	0	0	0	0	0	1	20	0	0	0	0	0	0
Solanaceae	*Solanum esuriale*	Quena	FG	0.5	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	EX	0.5	5	10	100	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum sturtianum*	Thargomindah Nightshade	SG	0	0	0	0	0	0	0.1	1	0	0	0.1	1	0.2	5	0.2	5
Verbenaceae	*Glandularia aristigera*	Mayne's Pest	EX	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Verbenaceae	*Verbena africana*		EX	0	0	0.2	3	0	0	0	0	0	0	0	0	0	0	0	0
Zygophyllaceae	*Roepera eremaea*	Climbing Twinleaf	FG	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0
Zygophyllaceae	*Zygophyllum iodocarpum*	Violet Twinleaf	FG	0	0	0	0	0	0	2	500	0.1	5	0	0	0	0	0	0

Table B.2 Floristic Data: Vegetation Zones 5–7

Family	Species Name	Common Name	Growth Form	P21982_017		P21982_018		P21982_031		P21982_032		P21982_033		P21982_023		P21982_024		P21982_003	
				VZ_5		VZ_5		VZ_5		VZ_5		VZ_5		VZ_6		VZ_6		VZ_7	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Aizoaceae	*Galenia pubescens*	Galenia	HTW	0	0	0	0	0	0	0	0	0	0	0.5	5	1	20	0	0
Aizoaceae	*Mesembryanthemum nodiflorum*	Small Ice Plant	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Sarcozona praecox*	Sarcozona	FG	0	0	0.1	1	0	0	0	0	0	0	0.1	1	0	0	0	0
Aizoaceae	*Tetragonia moorei*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Aizoaceae	*Tetragonia tetragonioides*	New Zealand Spinach	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Trianthema triquetra*	Small Hogweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Amaranthaceae	*Ptilotus obovatus*	Smoke Bush	SG	0.2	2	0.5	5	0.5	20	0.2	20	5	50	0	0	0	0	1	50
Anacardiaceae	*Searsia lancea*	African Sumac	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apiaceae	*Daucus glochidiatus*	Native Carrot	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	10	1	50
Apocynaceae	*Marsdenia australis*	Doubah	OG	0	0	0.1	3	0	0	0	0	0	0	0	0	0	0	0	0
Asphodelaceae	*Asphodelus fistulosus*	Onion Weed	EX	0	0	0	0	0	0	0	0	0	0	0	0	0.5	10	0	0
Asteraceae	*Brachyscome ciliaris*	Variable Daisy	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	5	0.2	20
Asteraceae	*Calotis hispidula*	Bogan Flea	FG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Calotis sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Chrysanthemoides monilifera subsp. monilifera*	Boneseed	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Chrysocephalum apiculatum*	Common Everlasting	FG	0	0	0	0	0	0	0.2	20	0.2	20	0	0	0	0	0.1	5
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Conyza sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Dimorphotheca ecklonis*	Cape Daisy	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Euchiton sp.*		FG	0	0	1	100	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Helianthus annuus*	Common Sunflower	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Hypochaeris sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	20
Asteraceae	*Lactuca serriola*	Prickly Lettuce	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Leiocarpa tomentosa*	Woolly Plover-daisy	FG	0	0	0	0	0	0	0	0	0	0	0.2	10	0.5	20	0	0
Asteraceae	*Leiocarpa websteri*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Minuria cunninghamii*	Bush Minuria	FG	0	0	0	0	0	0	0	0	0	0	0.5	10	0.2	10	0	0
Asteraceae	*Olearia pimeleoides*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Rhodanthe moschata*		FG	3	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Senecio cunninghamii*		FG	0	0	0	0	0	0	0	0	0	0	1	10	0	0	0	0
Asteraceae	*Senecio quadridentatus*	Cotton Fireweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2	0	0
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	EX	0	0	0	0	0	0	0	0	0	0	0.2	10	0.1	10	0.1	10
Asteraceae	*Vittadinia cuneata*		FG	0	0	0.2	5	0.1	10	0.1	20	0.1	2	0.1	1	0.1	1	0	0
Asteraceae	*Vittadinia eremaea*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Xanthium occidentale*	Noogoora Burr	HTW	0	0	0	0	0	0	0	0	0	0	1	5	0.2	2	0	0
Asteraceae	*Xanthium sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	5
Boraginaceae	*Echium plantagineum*	Patterson's Curse	EX	1	20	1	20	0	0	0	0	0	0	0.5	20	1	20	1	10
Brassicaceae	*Arabidella trisecta*		SG	0	0	1	20	0	0	1	50	1	20	0	0	0	0	0.5	20

Family	Species Name	Common Name	Growth Form	P21982_017		P21982_018		P21982_031		P21982_032		P21982_033		P21982_023		P21982_024		P21982_003	
				VZ_5		VZ_5		VZ_5		VZ_5		VZ_5		VZ_6		VZ_6		VZ_7	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Brassicaceae	*Carrichtera annua*	Ward's Weed	HTW	5	500	10	100	5	100	5	100	10	200	0	0	5	100	1	100
Brassicaceae	*Harmsiodoxa blennodioides*		FG	5	100	2	100	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Lepidium africanum*	Common Peppercress	EX	0	0	0	0	0	0	0	0	0	0	1	50	0.2	20	0	0
Brassicaceae	*Lepidium phlebopetalum*	Veined Peppercress	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Sisymbrium erysimoides*	Smooth Mustard	EX	0	0	0	0	0	0	0	0	0	0	0	0	0.2	10	0	0
Brassicaceae	*Sisymbrium irio*	London Rocket	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	50
Campanulaceae	*Isotoma petraea*	Rock Isotome	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
Chenopodiaceae	*Atriplex angulata*	Fan Saltbush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex conduplicata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex holocarpa*	Pop Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex limbata*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex lindleyi*	Eastern Flat-top Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex nummularia*	Old Man Saltbush	SG	0	0	0	0	0	0	0	0	0	0	0	0	15	20	0	0
Chenopodiaceae	*Atriplex stipitata*	Mallee Saltbush	SG	0	0	0.5	20	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex vesicaria*	Bladder Saltbush	SG	0	0	0	0	0	0	0	0	0	0	0.5	5	0.2	2	0	0
Chenopodiaceae	*Chenopodium cristatum*	Crested Goosefoot	FG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Chenopodium desertorum*	Desert Goosefoot	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Dissocarpus biflorus var. biflorus*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Dissocarpus paradoxus*	Cannonball Burr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Dysphania cristata*	Crested Crumbweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	SG	0	0	0.5	2	0.2	10	0.1	1	0.2	2	0	0	0	0	0	0
Chenopodiaceae	*Maireana brevifolia*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana decalvans*	Black Cotton Bush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana georgei*	Slit-wing Bluebush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana integra*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana pyramidata*	Black Bluebush	SG	0	0	0	0	1	20	5	50	5	20	10	20	15	50	20	10
Chenopodiaceae	*Maireana sclerolaenoides*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	10
Chenopodiaceae	*Maireana sedifolia*	Pearl Bluebush	SG	0	0	0	0	1	20	5	50	5	20	0	0	0	0	0	0
Chenopodiaceae	*Maireana sp.*	Cotton Bush, Bluebush, Fissure-weed	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana triptera*	Three-wing Bluebush	SG	3	10	1	5	0.2	10	0.2	20	1	20	0	0	0	0	0	0
Chenopodiaceae	*Osteocarpum acropterum var. deminutum*	Bonefruit	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Rhagodia spinescens*	Thorny Saltbush	SG	0	0	0	0	0	0	0	0	0	0	3	20	10	50	1	10
Chenopodiaceae	*Salsola australis*		SG	0	0	0	0	0.2	20	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena brachyptera*	Short-winged Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0

Family	Species Name	Common Name	Growth Form	P21982_017		P21982_018		P21982_031		P21982_032		P21982_033		P21982_023		P21982_024		P21982_003	
				VZ_5		VZ_5		VZ_5		VZ_5		VZ_5		VZ_6		VZ_6		VZ_7	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Chenopodiaceae	*Sclerolaena diacantha*	Grey Copperburr	SG	0.1	1	0.2	5	1	20	0.1	10	0.2	10	1	10	1	10	20	509
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	SG	0	0	0	0	1	20	0.5	20	0.1	5	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena eriacantha*	Silky Copperburr	SG	0	0	0.2	5	5	100	5	100	10	100	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena lanicuspis*	Woolly Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena limbata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0
Chenopodiaceae	*Sclerolaena obliquicuspis*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena tricuspis*	Giant Redburr	SG	0	0	0	0	0	0	0	0	0	0	1	10	1	10	0	0
Chenopodiaceae	*Sclerolaena ventricosa*	Salt Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	20
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulaceae	*Convolvulus remotus*		OG	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0.1	1
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	FG	0.2	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	Paddy Melon	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyperaceae	*Cyperus gymnocaulos*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	FG	0	0	0	0	0	0	0.1	2	0.1	1	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia peplus*	Petty Spurge	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis*		SG	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*		SG	0.2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Ricinus communis*	Castor Oil Plant	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Fabaceae (Caesalpinioideae)	*Senna artemisioides*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides <--> zygophylla*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. filifolia*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. X artemisioides*		SG	5	20	10	50	0.5	10	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Cullen cinereum*	Annual Verbine	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Glycine canescens*	Silky Glycine	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Lotus australis*	Australian Trefoil	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Lotus cruentus*	Red-flowered Lotus	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	EX	0	0	0	0	0	0	0	0	0	0	0.5	50	0	0	0	0
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	EX	0	0	0	0	0	0	0	0	0	0	25	1000	15	500	0	0
Fabaceae (Faboideae)	*Medicago sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Swainsona fissimontana*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Swainsona formosa*	Sturt's Desert Pea	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Vicia monantha*	Square-stemmed Vetch	EX	0	0	0	0	0	0	0	0	0	0	25	500	15	50	0	0
Fabaceae (Mimosoideae)	*Acacia aneura*	Mulga	SG	15	4	15	3	20	6	20	5	20	6	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_017		P21982_018		P21982_031		P21982_032		P21982_033		P21982_023		P21982_024		P21982_003	
				VZ_5		VZ_5		VZ_5		VZ_5		VZ_5		VZ_6		VZ_6		VZ_7	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Fabaceae (Mimosoideae)	*Acacia brachystachya*	Umbrella Mulga	SG	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia oswaldii*	Miljee	TG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0
Fabaceae (Mimosoideae)	*Acacia salicina*	Cooba	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia tetragonophylla*	Dead Finish	SG	5	3	0	0	5	10	0.2	2	10	5	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia victoriae*		SG	0	0	0.5	1	0	0	0.2	2	5	3	5	3	5	3	5	5
Fabaceae (Mimosoideae)	*Prosopis velutina*	Velvet Mesquite	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0.2	1	0	0
Fumariaceae	*Fumaria capreolata*	Climbing Fumitory	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	FG	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia berardiana*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia sp.*		FG	0	0	0	0	0	0	0	0	0	0	0.2	20	0	0	0	0
Goodeniaceae	*Scaevola spinescens*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lamiaceae	*Prostanthera striatiflora*	Jockey's Cap	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lamiaceae	*Salvia sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Loranthaceae	*Amyema maidenii*		OG	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Abutilon fraseri*	Dwarf Lantern-flower	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Abutilon halophilum*		SG	0.1	1	0.2	5	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Hibiscus sturtii*	Hill Hibiscus	FG	0.2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Malva parviflora*	Small-flowered Mallow	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Malvastrum americanum*	Spiked Malvastrum	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	10
Malvaceae	*Sida corrugata*	Corrugated Sida	FG	0	0	0	0	0	0	0.2	10	0	0	0	0	0	0	0	0
Malvaceae	*Sida fibulifera*	Pin Sida	FG	0	0	0.2	5	0.2	20	0.2	20	0	0	0	0	0	0	2	50
Malvaceae	*Sida intricata*		SG	0	0	0	0	0	0	0	0	0.1	2	0	0	0	0	0.2	10
Malvaceae	*Sida petrophila*		SG	0	0	0.1	1	0.2	20	0.2	20	5	50	0	0	0	0	5	100
Meliaceae	*Melia azedarach*	White Cedar	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myoporaceae	*Eremophila serrulata*	Green Fuchsia Bush	SG	0.1	1	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0
Myoporaceae	*Myoporum montanum*	Western Boobialla	SG	0	0	0	0	0	0	0	0	0	0	0.5	2	0.5	10	0	0
Myrtaceae	*Eucalyptus camaldulensis*	River Red Gum	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nyctaginaceae	*Boerhavia dominii*	Tarvine	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oxalidaceae	*Oxalis perennans*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Plantaginaceae	*Plantago cunninghamii*	Sago-weed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plantaginaceae	*Plantago sp.*	Plantain	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium lobatum*	Winged Sea Lavender	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium sinuatum*	Perennial Sea Lavender	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Aristida contorta*	Bunched Kerosene Grass	GG	0.1	1	0	0	1	50	5	200	10	100	0	0	0	0	0	0
Poaceae	*Aristida personata*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	5	50

Family	Species Name	Common Name	Growth Form	P21982_017		P21982_018		P21982_031		P21982_032		P21982_033		P21982_023		P21982_024		P21982_003	
				VZ_5		VZ_5		VZ_5		VZ_5		VZ_5		VZ_6		VZ_6		VZ_7	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Poaceae	*Arundo donax*	Giant Reed	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Austrostipa nitida*		GG	40	1000	30	100	20	200	1	50	20	200	0	0	0	0	5	50
Poaceae	*Austrostipa nodosa*		GG	0	0	0	0	0	0	0	0	0	0	5	20	0.5	5	0	0
Poaceae	*Chloris gayana*	Rhodes Grass	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Cymbopogon ambiguus*	Lemon Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	20
Poaceae	*Cynodon dactylon*	Common Couch	GG	0	0	0	0	0	0	0	0	0	0	5	20	1	10	0	0
Poaceae	*Dactyloctenium radulans*	Button Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Dichanthium sericeum subsp. sericeum*	Queensland Bluegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Digitaria brownii*	Cotton Panic Grass	GG	0.1	1	0	0	0.2	50	0.1	10	5	50	0	0	0	0	0	0
Poaceae	*Digitaria coenicola*	Finger Panic Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enneapogon avenaceus*	Bottle Washers	GG	0	0	0	0	5	100	5	200	5	50	0	0	0	0	0.1	1
Poaceae	*Enneapogon intermedius*		GG	5	100	5	50	5	100	5	100	0	0	0	0	0	0	5	50
Poaceae	*Enneapogon sp.*	Nineawn Grass, Bottlewashers	GG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	GG	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0
Poaceae	*Eragrostis cilianensis*	Stinkgrass	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis dielsii*	Mallee Lovegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis sp.*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Piptatherum miliaceum*	Rice Millet	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Sporobolus caroli*	Fairy Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Thyridolepis mitchelliana*	Mulga Mitchell Grass	GG	0.5	10	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Polygonaceae	*Rumex crispus*	Curled Dock	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polygonaceae	*Rumex vesicarius*	Bladder Dock	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portulacaceae	*Portulaca oleracea*	Pigweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	5
Portulacaceae	*Portulaca sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteridaceae	*Cheilanthes lasiophylla*		EG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0
Pteridaceae	*Cheilanthes sieberi subsp. sieberi*	Rock Fern	EG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubiaceae	*Galium aparine*	Goosegrass	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santalaceae	*Santalum acuminatum*	Sweet Quandong	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sapindaceae	*Dodonaea lobulata*		SG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0
Sapindaceae	*Dodonaea viscosa subsp. angustissima*	Narrow-leaf Hop-bush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Lycium australe*	Australian Boxthorn	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Lycium ferocissimum*	African Boxthorn	HTW	0	0	0	0	0	0	0	0	0	0	3	2	5	5	0	0
Solanaceae	*Solanum ellipticum*	Velvet Potato Bush	FG	0	0	0	0	0.2	10	0.2	20	1	20	0	0	0	0	1	50

Family	Species Name	Common Name	Growth Form	P21982_017		P21982_018		P21982_031		P21982_032		P21982_033		P21982_023		P21982_024		P21982_003	
				VZ_5		VZ_5		VZ_5		VZ_5		VZ_5		VZ_6		VZ_6		VZ_7	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Solanaceae	*Solanum esuriale*	Quena	FG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum sturtianum*	Thargomindah Nightshade	SG	0.2	5	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Verbenaceae	*Glandularia aristigera*	Mayne's Pest	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Verbenaceae	*Verbena africana*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zygophyllaceae	*Roepera eremaea*	Climbing Twinleaf	FG	0	0	0.2	1	0	0	0	0	0	0	0	0	0	0	0	0
Zygophyllaceae	*Zygophyllum iodocarpum*	Violet Twinleaf	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B.3 Floristic Data Vegetation Zones 7–10

Family	Species Name	Common Name	Growth Form	P21982_010		P21982_029		P21982_030		P21982_012		P21982_013		P21982_014		P21982_015		P21982_001	
				VZ_7		VZ_7		VZ_7		VZ_8		VZ_8		VZ_9		VZ_9		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Aizoaceae	*Galenia pubescens*	Galenia	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Mesembryanthemum nodiflorum*	Small Ice Plant	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Sarcozona praecox*	Sarcozona	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Tetragonia moorei*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Tetragonia tetragonioides*	New Zealand Spinach	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
Aizoaceae	*Trianthema triquetra*	Small Hogweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amaranthaceae	*Ptilotus obovatus*	Smoke Bush	SG	0	0	0.1	5	0	0	0	0	0	0	0	0	0	0	0.5	20
Anacardiaceae	*Searsia lancea*	African Sumac	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apiaceae	*Daucus glochidiatus*	Native Carrot	FG	0	0	0.1	10	0	0	0.2	20	0	0	0	0	0	0	0.1	10
Apocynaceae	*Marsdenia australis*	Doubah	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asphodelaceae	*Asphodelus fistulosus*	Onion Weed	EX	2	100	0	0	0	0	5	100	5	100	5	500	0	0	0	0
Asteraceae	*Brachyscome ciliaris*	Variable Daisy	FG	0.5	50	0.2	20	5	100	0.2	5	0.2	5	0	0	0	0	0.1	1
Asteraceae	*Calotis hispidula*	Bogan Flea	FG	0.1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Calotis sp.*		FG	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Chrysanthemoides monilifera subsp. monilifera*	Boneseed	HTW	0	0	0	0	0	0	0.2	1	0	0	0	0	0	0	0	0
Asteraceae	*Chrysocephalum apiculatum*	Common Everlasting	FG	0.1	2	0.1	10	1	50	0	0	0	0	0	0	0.1	1	0	0
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Conyza sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Dimorphotheca ecklonis*	Cape Daisy	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Euchiton sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Helianthus annuus*	Common Sunflower	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Hypochaeris sp.*		EX	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0.1	20
Asteraceae	*Lactuca serriola*	Prickly Lettuce	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Leiocarpa tomentosa*	Woolly Plover-daisy	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2
Asteraceae	*Leiocarpa websteri*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_010		P21982_029		P21982_030		P21982_012		P21982_013		P21982_014		P21982_015		P21982_001	
				VZ_7		VZ_7		VZ_7		VZ_8		VZ_8		VZ_9		VZ_9		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Asteraceae	*Minuria cunninghamii*	Bush Minuria	FG	0.1	1	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0
Asteraceae	*Olearia pimeleoides*		SG	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0
Asteraceae	*Rhodanthe moschata*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Senecio cunninghamii*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Senecio quadridentatus*	Cotton Fireweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	EX	0	0	0	0	0.1	1	0.1	1	0	0	0	0	0.1	1	0	0
Asteraceae	*Vittadinia cuneata*		FG	0.5	20	0.1	20	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Vittadinia eremaea*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Xanthium occidentale*	Noogoora Burr	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Xanthium sp.*		EX	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0
Boraginaceae	*Echium plantagineum*	Patterson's Curse	EX	1	20	0.1	1	0	0	0	0	0	0	0.5	10	0.5	10	0	0
Brassicaceae	*Arabidella trisecta*		SG	0	0	0.1	1	0	0	2	100	5	100	0	0	0	0	0.1	5
Brassicaceae	*Carrichtera annua*	Ward's Weed	HTW	5	500	5	200	5	200	0.5	50	10	1000	15	500	40	1000	0.2	50
Brassicaceae	*Harmsiodoxa blennodioides*		FG	0.1	5	0	0	0	0	0	0	0.1	1	0.2	10	0.1	10	0	0
Brassicaceae	*Lepidium africanum*	Common Peppercress	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Lepidium phlebopetalum*	Veined Peppercress	FG	0	0	0	0	0	0	1	50	1	50	0	0	0	0	0	0
Brassicaceae	*Sisymbrium erysimoides*	Smooth Mustard	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Sisymbrium irio*	London Rocket	EX	10	100	0.2	10	0.2	20	0	0	0	0	1	50	5	100	0	0
Campanulaceae	*Isotoma petraea*	Rock Isotome	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	FG	0	0	0.1	1	0.1	20	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex angulata*	Fan Saltbush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex conduplicata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex holocarpa*	Pop Saltbush	FG	0	0	0	0	0.2	10	0	0	0	0	0	0	1	10	0	0
Chenopodiaceae	*Atriplex limbata*		FG	0.5	1	0	0	0	0	0	0	0	0	0.1	1	0.2	1	0	0
Chenopodiaceae	*Atriplex lindleyi*	Eastern Flat-top Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex nummularia*	Old Man Saltbush	SG	10	20	0	0	0.5	5	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex stipitata*	Mallee Saltbush	SG	0	0	0	0	0.2	20	0.2	3	0.2	3	0.2	3	0	0	0	0
Chenopodiaceae	*Atriplex vesicaria*	Bladder Saltbush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Chenopodium cristatum*	Crested Goosefoot	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Chenopodium desertorum*	Desert Goosefoot	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Dissocarpus biflorus var. biflorus*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Dissocarpus paradoxus*	Cannonball Burr	SG	0.2	10	0	0	0	0	0	0	0.1	1	15	0	1	20	0.2	10
Chenopodiaceae	*Dysphania cristata*	Crested Crumbweed	FG	0	0	0	0	0	0	0	0	0	0	0.2	10	0.1	1	0	0
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	FG	0	0	0.1	2	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing Saltbush	FG	0.1	1	0	0	0	0	0.1	1	0.2	2	0	0	0	0	0	0
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	SG	0	0	0.1	1	0	0	0	0	0.5	2	0	0	0	0	0	0
Chenopodiaceae	*Maireana brevifolia*		SG	0.1	1	0	0	0	0	0	0	0	0	0	0	1	10	0	0
Chenopodiaceae	*Maireana decalvans*	Black Cotton Bush	SG	0	0	0	0	0	0	2	10	0.5	3	0.5	3	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_010		P21982_029		P21982_030		P21982_012		P21982_013		P21982_014		P21982_015		P21982_001	
				VZ_7		VZ_7		VZ_7		VZ_8		VZ_8		VZ_9		VZ_9		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Chenopodiaceae	*Maireana georgei*	Slit-wing Bluebush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana integra*		SG	0	0	0	0	0	0	0	0	0.2	2	0	0	0	0	0.2	10
Chenopodiaceae	*Maireana pyramidata*	Black Bluebush	SG	5	20	2	20	10	20	0.1	1	5	10	0.5	1	0.5	1	0	0
Chenopodiaceae	*Maireana sclerolaenoides*		SG	0	0	0.5	30	1	50	1	10	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana sedifolia*	Pearl Bluebush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana sp.*	Cotton Bush, Bluebush, Fissure-weed	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana triptera*	Three-wing Bluebush	SG	0	0	1	20	0	0	5	20	2	10	1	10	0	0	0	0
Chenopodiaceae	*Osteocarpum acropterum var. deminutum*	Bonefruit	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Rhagodia spinescens*	Thorny Saltbush	SG	0	0	0	0	0	0	0.5	5	1	3	0	0	0.2	1	0	0
Chenopodiaceae	*Salsola australis*		SG	5	100	0.1	20	1	50	0.2	10	0.2	5	1	20	5	59	0	0
Chenopodiaceae	*Sclerolaena brachyptera*	Short-winged Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena diacantha*	Grey Copperburr	SG	5	20	20	400	5	50	3	50	1	20	1	10	5	20	5	50
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena eriacantha*	Silky Copperburr	SG	0	0	0.1	3	0	0	0	0	0	0	0	0	0	0	15	100
Chenopodiaceae	*Sclerolaena lanicuspis*	Woolly Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena limbata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena obliquicuspis*		SG	0.2	10	0	0	0.2	10	2	50	2	20	2	40	5	20	0	0
Chenopodiaceae	*Sclerolaena tricuspis*	Giant Redburr	SG	0	0	0	0	0.2	20	0	0	0.2	1	5	20	5	20	0	0
Chenopodiaceae	*Sclerolaena ventricosa*	Salt Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulaceae	*Convolvulus remotus*		OG	0.1	5	0.1	2	0	0	0.1	5	0.2	1	0	0	0.2	2	0	0
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	Paddy Melon	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyperaceae	*Cyperus gymnocaulos*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	FG	0	0	0	0	0.1	1	0.1	1	0	0	0	0	0.1	1	0	0
Euphorbiaceae	*Euphorbia peplus*	Petty Spurge	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Ricinus communis*	Castor Oil Plant	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides*		SG	0	0	0	0	0	0	0	0	0	0	0.2	1	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides <--> zygophylla*		SG	1	5	0	0	0	0	0.2	1	0	0	0.2	1	1	3	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. filifolia*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. X artemisioides*		SG	0	0	0.2	3	0.1	1	0	0	0	0	0.2	1	0	0	0	0
Fabaceae (Faboideae)	*Cullen cinereum*	Annual Verbine	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Glycine canescens*	Silky Glycine	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_010		P21982_029		P21982_030		P21982_012		P21982_013		P21982_014		P21982_015		P21982_001	
				VZ_7		VZ_7		VZ_7		VZ_8		VZ_8		VZ_9		VZ_9		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Fabaceae (Faboideae)	*Lotus australis*	Australian Trefoil	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Lotus cruentus*	Red-flowered Lotus	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	5	100	0	0
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago sp.*		EX	5	100	0.1	10	0	0	0	0	0.5	20	5	100	0	0	0	0
Fabaceae (Faboideae)	*Swainsona fissimontana*		FG	0	0	0	0	0	0	0.5	50	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Swainsona formosa*	Sturt's Desert Pea	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Vicia monantha*	Square-stemmed Vetch	EX	1	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia aneura*	Mulga	SG	2	1	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia brachystachya*	Umbrella Mulga	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia oswaldii*	Miljee	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia salicina*	Cooba	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia tetragonophylla*	Dead Finish	SG	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0.1	1
Fabaceae (Mimosoideae)	*Acacia victoriae*		SG	5	10	5	10	5	7	0.5	2	0.5	1	0	0	1	1	0	0
Fabaceae (Mimosoideae)	*Prosopis velutina*	Velvet Mesquite	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fumariaceae	*Fumaria capreolata*	Climbing Fumitory	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	FG	0	0	0	0	0	0	0	0	0	0	0.2	20	0	0	0	0
Goodeniaceae	*Goodenia berardiana*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	FG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia sp.*		FG	0	0	0	0	0	0	0.1	3	0	0	0	0	0	0	0	0
Goodeniaceae	*Scaevola spinescens*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lamiaceae	*Prostanthera striatiflora*	Jockey's Cap	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Lamiaceae	*Salvia sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loranthaceae	*Amyema maidenii*		OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Abutilon fraseri*	Dwarf Lantern-flower	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Abutilon halophilum*		SG	0.1	2	0	0	0	0	0.1	1	0	0	0.1	1	0.5	20	0	0
Malvaceae	*Hibiscus sturtii*	Hill Hibiscus	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Malva parviflora*	Small-flowered Mallow	EX	0	0	0	0	0	0	0	0	0	0	0	0	0.1	2	0	0
Malvaceae	*Malvastrum americanum*	Spiked Malvastrum	EX	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Sida corrugata*	Corrugated Sida	FG	0	0	0	0	0	0	0.2	10	0	0	0	0	0	0	0	0
Malvaceae	*Sida fibulifera*	Pin Sida	FG	5	100	1	100	5	50	0.5	20	0.5	20	0.2	10	0.5	20	0	0
Malvaceae	*Sida intricata*		SG	2	50	0.1	1	0.1	5	0	0	0.1	1	0	0	0.5	20	0.2	5
Malvaceae	*Sida petrophila*		SG	0	0	1	50	0.2	20	0	0	0	0	0	0	0	0	15	100

Family	Species Name	Common Name	Growth Form	P21982_010		P21982_029		P21982_030		P21982_012		P21982_013		P21982_014		P21982_015		P21982_001	
				VZ_7		VZ_7		VZ_7		VZ_8		VZ_8		VZ_9		VZ_9		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Meliaceae	*Melia azedarach*	White Cedar	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myoporaceae	*Eremophila serrulata*	Green Fuchsia Bush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myoporaceae	*Myoporum montanum*	Western Boobialla	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myrtaceae	*Eucalyptus camaldulensis*	River Red Gum	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nyctaginaceae	*Boerhavia dominii*	Tarvine	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1
Oxalidaceae	*Oxalis perennans*		FG	0	0	0.1	1	0.1	1	0	0	0	0	0	0	0	0	0	0
Plantaginaceae	*Plantago cunninghamii*	Sago-weed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plantaginaceae	*Plantago sp.*	Plantain	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium lobatum*	Winged Sea Lavender	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium sinuatum*	Perennial Sea Lavender	EX	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Aristida contorta*	Bunched Kerosene Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	20
Poaceae	*Aristida personata*		GG	0	0	0	0	1	50	0	0	0	0	0	0	0	0	0	0
Poaceae	*Arundo donax*	Giant Reed	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Austrostipa nitida*		GG	10	100	5	100	5	100	10	100	5	20	2	20	1	20	0.1	5
Poaceae	*Austrostipa nodosa*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Chloris gayana*	Rhodes Grass	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Cymbopogon ambiguus*	Lemon Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Cynodon dactylon*	Common Couch	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Dactyloctenium radulans*	Button Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Dichanthium sericeum subsp. sericeum*	Queensland Bluegrass	GG	0.2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Digitaria brownii*	Cotton Panic Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	10
Poaceae	*Digitaria coenicola*	Finger Panic Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enneapogon avenaceus*	Bottle Washers	GG	0	0	0	0	0	0	20	100	20	500	0	0	0	0	0	0
Poaceae	*Enneapogon intermedius*		GG	2	100	5	100	10	300	20	500	20	500	0.5	10	0.5	20	0.5	20
Poaceae	*Enneapogon sp.*	Nineawn Grass, Bottlewashers	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis cilianensis*	Stinkgrass	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis dielsii*	Mallee Lovegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis sp.*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	GG	0.1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Piptatherum miliaceum*	Rice Millet	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	GG	0.1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Sporobolus caroli*	Fairy Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Thyridolepis mitchelliana*	Mulga Mitchell Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polygonaceae	*Rumex crispus*	Curled Dock	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polygonaceae	*Rumex vesicarius*	Bladder Dock	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	5

Family	Species Name	Common Name	Growth Form	P21982_010		P21982_029		P21982_030		P21982_012		P21982_013		P21982_014		P21982_015		P21982_001	
				VZ_7		VZ_7		VZ_7		VZ_8		VZ_8		VZ_9		VZ_9		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Portulacaceae	*Portulaca oleracea*	Pigweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.2	5	0	0
Portulacaceae	*Portulaca sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteridaceae	*Cheilanthes lasiophylla*		EG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	10
Pteridaceae	*Cheilanthes sieberi subsp. sieberi*	Rock Fern	EG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubiaceae	*Galium aparine*	Goosegrass	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santalaceae	*Santalum acuminatum*	Sweet Quandong	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sapindaceae	*Dodonaea lobulata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sapindaceae	*Dodonaea viscosa subsp. angustissima*	Narrow-leaf Hop-bush	SG	0	0	0	0	0	0	0.5	2	0	0	0	0	0	0	0	0
Solanaceae	*Lycium australe*	Australian Boxthorn	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Lycium ferocissimum*	African Boxthorn	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum ellipticum*	Velvet Potato Bush	FG	0	0	0.5	30	0.2	10	0	0	0	0	0	0	0	0	0.2	20
Solanaceae	*Solanum esuriale*	Quena	FG	2	50	0.1	1	0	0	0.1	2	0	0	0	0	0	0	0	0
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum sturtianum*	Thargomindah Nightshade	SG	0	0	0	0	0	0	0	0	0	0	0	0	0.2	3	0	0
Verbenaceae	*Glandularia aristigera*	Mayne's Pest	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Verbenaceae	*Verbena africana*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zygophyllaceae	*Roepera eremaea*	Climbing Twinleaf	FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	1	0	0
Zygophyllaceae	*Zygophyllum iodocarpum*	Violet Twinleaf	FG	0.1	2	0	0	0	0	5	500	10	1000	20	500	0.1	1	0	0

Table B.4 Floristic Data Vegetation Zone 10

Family	Species Name	Common Name	Growth Form	P21982_002		P21982_007		P21982_009		P21982_020		P21982_025		P21982_026		P21982_027		P21982_028	
				VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Aizoaceae	*Galenia pubescens*	Galenia	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Mesembryanthemum nodiflorum*	Small Ice Plant	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Sarcozona praecox*	Sarcozona	FG	0	0	0	0	0	0	0.2	5	0	0	0	0	0	0	0	0
Aizoaceae	*Tetragonia moorei*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Tetragonia tetragonioides*	New Zealand Spinach	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aizoaceae	*Trianthema triquetra*	Small Hogweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Amaranthaceae	*Ptilotus obovatus*	Smoke Bush	SG	0	0	0	0	0	0	0	0	1	10	0	0	0	0	0	0
Anacardiaceae	*Searsia lancea*	African Sumac	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apiaceae	*Daucus glochidiatus*	Native Carrot	FG	0	0	0.1	10	0.1	10	0	0	0	0	0	0	0	0	0	0
Apocynaceae	*Marsdenia australis*	Doubah	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asphodelaceae	*Asphodelus fistulosus*	Onion Weed	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Brachyscome ciliaris*	Variable Daisy	FG	0.1	5	0.5	20	0.2	5	0.2	10	0	0	0.2	20	0	0	0.1	20
Asteraceae	*Calotis hispidula*	Bogan Flea	FG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_002		P21982_007		P21982_009		P21982_020		P21982_025		P21982_026		P21982_027		P21982_028	
				VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Asteraceae	*Calotis sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Chrysanthemoides monilifera subsp. monilifera*	Boneseed	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Chrysocephalum apiculatum*	Common Everlasting	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Conyza sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Dimorphotheca ecklonis*	Cape Daisy	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Euchiton sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Helianthus annuus*	Common Sunflower	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Hypochaeris sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Lactuca serriola*	Prickly Lettuce	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Leiocarpa tomentosa*	Woolly Plover-daisy	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Leiocarpa websteri*		FG	0	0	0.2	20	0.2	10	0.1	1	0	0	0	0	0	0	0	0
Asteraceae	*Minuria cunninghamii*	Bush Minuria	FG	0	0	0	0	0.1	1	0.1	1	0	0	0	0	0	0	0	0
Asteraceae	*Olearia pimeleoides*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Rhodanthe moschata*		FG	0.1	1	0.1	5	0	0	0	0	0	0	0	0	0.1	1	0	0
Asteraceae	*Senecio cunninghamii*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Senecio quadridentatus*	Cotton Fireweed	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Vittadinia cuneata*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0.1	10	0.1	20
Asteraceae	*Vittadinia eremaea*		FG	0	0	0	0	0	0	0.1	1	0.1	1	0	0	0	0	0	0
Asteraceae	*Xanthium occidentale*	Noogoora Burr	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asteraceae	*Xanthium sp.*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Boraginaceae	*Echium plantagineum*	Patterson's Curse	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Arabidella trisecta*		SG	0.2	10	0.2	20	0.5	20	1	20	5	20	0	0	0	0	0	0
Brassicaceae	*Carrichtera annua*	Ward's Weed	HTW	0.5	100	0.5	50	0	0	0.5	20	5	100	5	500	0.5	100	5	500
Brassicaceae	*Harmsiodoxa blennodioides*		FG	0	0	0.1	20	0.1	1	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Lepidium africanum*	Common Peppercress	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Lepidium phlebopetalum*	Veined Peppercress	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Sisymbrium erysimoides*	Smooth Mustard	EX	0	0	0.2	10	0	0	0	0	0	0	0	0	0	0	0	0
Brassicaceae	*Sisymbrium irio*	London Rocket	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campanulaceae	*Isotoma petraea*	Rock Isotome	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex angulata*	Fan Saltbush	SG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0
Chenopodiaceae	*Atriplex conduplicata*		SG	0	0	0.1	2	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex holocarpa*	Pop Saltbush	FG	0	0	0.2	5	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex limbata*		FG	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex lindleyi*	Eastern Flat-top Saltbush	FG	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Atriplex nummularia*	Old Man Saltbush	SG	0	0	0.5	3	0	0	0	0	0	0	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_002		P21982_007		P21982_009		P21982_020		P21982_025		P21982_026		P21982_027		P21982_028	
				VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Chenopodiaceae	*Atriplex stipitata*	Mallee Saltbush	SG	0	0	0	0	0.1	1	0.2	3	0.2	2	0.1	5	0.2	10	0	0
Chenopodiaceae	*Atriplex vesicaria*	Bladder Saltbush	SG	0	0	0	0	10	20	0	0	0	0	0	0	0	0	0.2	30
Chenopodiaceae	*Chenopodium cristatum*	Crested Goosefoot	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Chenopodium desertorum*	Desert Goosefoot	SG	0	0	0	0	0	0	0	0	0	0	0	0	0.2	20	0	0
Chenopodiaceae	*Dissocarpus biflorus var. biflorus*		SG	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Dissocarpus paradoxus*	Cannonball Burr	SG	0	0	20	20	0	0	0	0	5	20	0	0	0	0	0	0
Chenopodiaceae	*Dysphania cristata*	Crested Crumbweed	FG	0	0	0	0	0	0	0	0	0.5	5	0	0	0	0	0	0
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing Saltbush	FG	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	SG	0.2	1	0	0	0	0	0	0	0	0	0	0	0	0	0.1	10
Chenopodiaceae	*Maireana brevifolia*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana decalvans*	Black Cotton Bush	SG	0	0	0	0	0	0	2	10	5	20	0	0	0	0	0	0
Chenopodiaceae	*Maireana georgei*	Slit-wing Bluebush	SG	5	20	0	0	0	0	0	0	0	0	1	10	0.1	5	0	0
Chenopodiaceae	*Maireana integra*		SG	0	0	0	0	0.1	1	3	10	10	50	0	0	0	0	0	0
Chenopodiaceae	*Maireana pyramidata*	Black Bluebush	SG	0.5	3	10	50	10	50	15	25	5	10	1	50	0.5	20	0.5	50
Chenopodiaceae	*Maireana sclerolaenoides*		SG	1	20	0	0	0	0	0	0	0	0	0.1	1	0	0	0.1	20
Chenopodiaceae	*Maireana sedifolia*	Pearl Bluebush	SG	5	50	0	0	0	0	0	0	0	0	5	50	0.5	20	5	50
Chenopodiaceae	*Maireana sp.*	Cotton Bush, Bluebush, Fissure-weed	SG	0	0	0.1	2	0.1	1	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Maireana triptera*	Three-wing Bluebush	SG	0	0	5	20	0.5	10	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Osteocarpum acropterum var. deminutum*	Bonefruit	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Rhagodia spinescens*	Thorny Saltbush	SG	0	0	1	5	1	20	0	0	5	20	0	0	0.1	5	0	0
Chenopodiaceae	*Salsola australis*		SG	0.1	2	0.1	2	0.2	5	0	0	1	10	0.1	10	0.1	20	0	0
Chenopodiaceae	*Sclerolaena brachyptera*	Short-winged Copperburr	SG	0	0	0	0	5	50	0.1	1	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena diacantha*	Grey Copperburr	SG	35	1000	5	50	2	50	5	20	5	20	1	50	5	100	2	100
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena eriacantha*	Silky Copperburr	SG	5	50	0.5	10	25	500	30	500	5	50	0	0	1	50	0.1	20
Chenopodiaceae	*Sclerolaena lanicuspis*	Woolly Copperburr	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	10
Chenopodiaceae	*Sclerolaena limbata*		SG	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena obliquicuspis*		SG	0	0	0	0	0	0	0	0	10	50	0	0	0	0	0	0
Chenopodiaceae	*Sclerolaena tricuspis*	Giant Redburr	SG	0	0	20	100	10	100	5	20	5	20	0	0	0.1	5	0	0
Chenopodiaceae	*Sclerolaena ventricosa*	Salt Copperburr	SG	0	0	0	0	0	0	0	0	0	0	1	30	0.1	5	0	0
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Convolvulaceae	*Convolvulus remotus*		OG	0.1	1	0	0	0	0	0	0	0.1	1	0.1	5	0	0	0	0
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	Paddy Melon	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cyperaceae	*Cyperus gymnocaulos*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	FG	0	0	0	0	0	0	0.2	10	0	0	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_002		P21982_007		P21982_009		P21982_020		P21982_025		P21982_026		P21982_027		P21982_028	
				VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Euphorbiaceae	*Euphorbia peplus*	Petty Spurge	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*		SG	0	0	0	0	0	0	0	0	0.1	2	0	0	0	0	0	0
Euphorbiaceae	*Ricinus communis*	Castor Oil Plant	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides*		SG	0	0	0	0	0	0	0.5	5	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides <--> zygophylla*		SG	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. filifolia*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. X artemisioides*		SG	0	0	0.5	4	0.1	1	0	0	5	5	1	5	0.1	2	0	0
Fabaceae (Faboideae)	*Cullen cinereum*	Annual Verbine	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Glycine canescens*	Silky Glycine	OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Lotus australis*	Australian Trefoil	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Lotus cruentus*	Red-flowered Lotus	FG	0	0	0	0	0	0	0	0	5	100	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Medicago sp.*		EX	0	0	0.2	10	1	100	1	100	0	0	0.1	5	0.1	10	0.1	20
Fabaceae (Faboideae)	*Swainsona fissimontana*		FG	0.1	3	0.1	1	0	0	0	0	0.1	10	0	0	0.1	1	0	0
Fabaceae (Faboideae)	*Swainsona formosa*	Sturt's Desert Pea	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Faboideae)	*Vicia monantha*	Square-stemmed Vetch	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia aneura*	Mulga	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia brachystachya*	Umbrella Mulga	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia oswaldii*	Miljee	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia salicina*	Cooba	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia tetragonophylla*	Dead Finish	SG	0.2	2	0	0	0	0	0	0	0	0	0	0	0.1	1	0.1	2
Fabaceae (Mimosoideae)	*Acacia victoriae*		SG	0.2	1	0.1	1	0	0	3	3	0	0	0.1	2	0.1	1	0	0
Fabaceae (Mimosoideae)	*Prosopis velutina*	Velvet Mesquite	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fumariaceae	*Fumaria capreolata*	Climbing Fumitory	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	FG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0
Goodeniaceae	*Goodenia berardiana*		FG	0	0	0	0	0	0	0.2	20	0.1	10	0	0	0	0	0	0
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Goodenia sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodeniaceae	*Scaevola spinescens*		SG	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0.2	2
Lamiaceae	*Prostanthera striatiflora*	Jockey's Cap	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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				VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Lamiaceae	*Salvia sp.*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Loranthaceae	*Amyema maidenii*		OG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Abutilon fraseri*	Dwarf Lantern-flower	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Abutilon halophilum*		SG	0	0	0	0	0	0	0.2	10	0	0	0	0	0	0	0	0
Malvaceae	*Hibiscus sturtii*	Hill Hibiscus	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Malva parviflora*	Small-flowered Mallow	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Malvastrum americanum*	Spiked Malvastrum	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malvaceae	*Sida corrugata*	Corrugated Sida	FG	0	0	0	0	0	0	0	0	0.1	1	0	0	0	0	0	0
Malvaceae	*Sida fibulifera*	Pin Sida	FG	0.1	3	0.1	2	0.5	50	0.2	10	0.1	1	0.1	10	0.2	30	0.2	50
Malvaceae	*Sida intricata*		SG	0	0	0	0	2	50	0	0	0	0	0	0	0.1	1	0	0
Malvaceae	*Sida petrophila*		SG	5	50	0	0	0	0	0	0	0.1	1	0.1	5	0	0	0.1	20
Meliaceae	*Melia azedarach*	White Cedar	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myoporaceae	*Eremophila serrulata*	Green Fuchsia Bush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myoporaceae	*Myoporum montanum*	Western Boobialla	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Myrtaceae	*Eucalyptus camaldulensis*	River Red Gum	TG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nyctaginaceae	*Boerhavia dominii*	Tarvine	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oxalidaceae	*Oxalis perennans*		FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plantaginaceae	*Plantago cunninghamii*	Sago-weed	FG	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Plantaginaceae	*Plantago sp.*	Plantain	FG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium lobatum*	Winged Sea Lavender	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumbaginaceae	*Limonium sinuatum*	Perennial Sea Lavender	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Aristida contorta*	Bunched Kerosene Grass	GG	0	0	0	0	0.2	10	0	0	0	0	0	0	0	0	0	0
Poaceae	*Aristida personata*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Arundo donax*	Giant Reed	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Austrostipa nitida*		GG	5	50	1	20	5	50	1	20	15	100	10	100	1	50	0.1	50
Poaceae	*Austrostipa nodosa*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Chloris gayana*	Rhodes Grass	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Cymbopogon ambiguus*	Lemon Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Cynodon dactylon*	Common Couch	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Dactyloctenium radulans*	Button Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Dichanthium sericeum subsp. sericeum*	Queensland Bluegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Digitaria brownii*	Cotton Panic Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Digitaria coenicola*	Finger Panic Grass	GG	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enneapogon avenaceus*	Bottle Washers	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enneapogon intermedius*		GG	5	100	0.1	3	0.5	20	15	500	5	50	1	50	1	100	1	200
Poaceae	*Enneapogon sp.*	Nineawn Grass, Bottlewashers	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_002		P21982_007		P21982_009		P21982_020		P21982_025		P21982_026		P21982_027		P21982_028	
				VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10		VZ_10	
				Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance	Percent Cover	Abundance
Poaceae	*Eragrostis cilianensis*	Stinkgrass	EX	0	0	0.1	2	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis dielsii*	Mallee Lovegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Eragrostis sp.*		GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Piptatherum miliaceum*	Rice Millet	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Sporobolus caroli*	Fairy Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poaceae	*Thyridolepis mitchelliana*	Mulga Mitchell Grass	GG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polygonaceae	*Rumex crispus*	Curled Dock	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Polygonaceae	*Rumex vesicarius*	Bladder Dock	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portulacaceae	*Portulaca oleracea*	Pigweed	FG	0.1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portulacaceae	*Portulaca sp.*		FG	0	0	0	0	0	0	0.2	10	0	0	0	0	0	0	0	0
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteridaceae	*Cheilanthes lasiophylla*		EG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pteridaceae	*Cheilanthes sieberi subsp. sieberi*	Rock Fern	EG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rubiaceae	*Galium aparine*	Goosegrass	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Santalaceae	*Santalum acuminatum*	Sweet Quandong	SG	0	0	0	0	0	0	0	0	0.5	1	0	0	0	0	0	0
Sapindaceae	*Dodonaea lobulata*		SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sapindaceae	*Dodonaea viscosa subsp. angustissima*	Narrow-leaf Hop-bush	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Lycium australe*	Australian Boxthorn	SG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Lycium ferocissimum*	African Boxthorn	HTW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum ellipticum*	Velvet Potato Bush	FG	1	50	0	0	0	0	0	0	0	0	0.5	20	0.1	10	0.2	30
Solanaceae	*Solanum esuriale*	Quena	FG	0	0	0.1	10	0	0	0.2	10	0.1	1	0.1	5	0	0	0	0
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanaceae	*Solanum sturtianum*	Thargomindah Nightshade	SG	0	0	0	0	0	0	0	0	0.2	1	0	0	0	0	0	0
Verbenaceae	*Glandularia aristigera*	Mayne's Pest	EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Verbenaceae	*Verbena africana*		EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zygophyllaceae	*Roepera eremaea*	Climbing Twinleaf	FG	0	0	0	0	0.1	1	0	0	0	0	0	0	0	0	0	0
Zygophyllaceae	*Zygophyllum iodocarpum*	Violet Twinleaf	FG	0	0	0	0	0.1	1	0	0	0.1	1	0	0	0	0	0	0

Table B.5 Floristic Fata Vegetation Zone 11

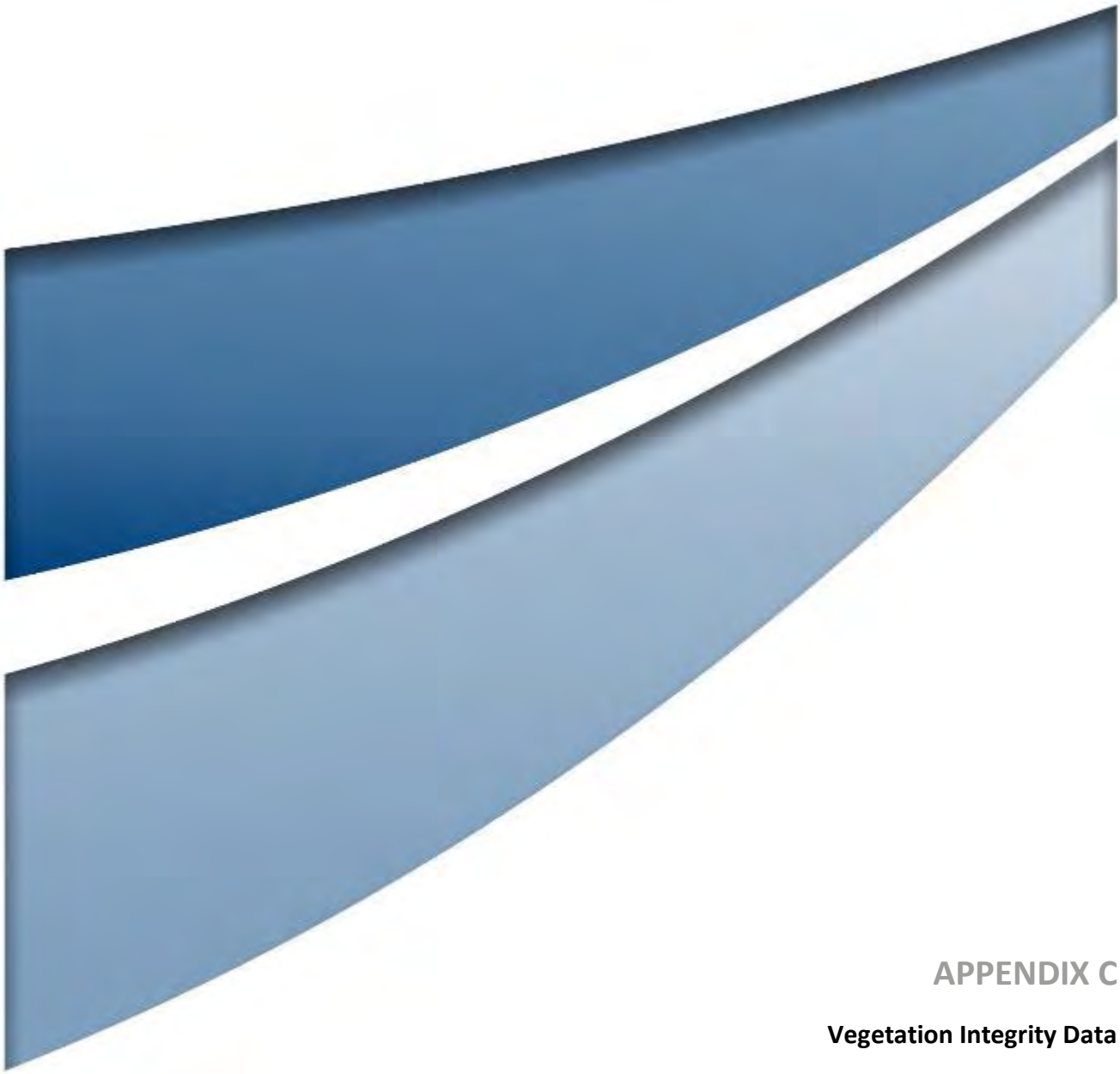
Family	Species Name	Common Name	Growth Form	P21982_005		P21982_022	
				VZ_11		VZ_11	
				Percent Cover	Abundance	Percent Cover	Abundance
Aizoaceae	*Galenia pubescens*	Galenia	HTW	0	0	0	0
Aizoaceae	*Mesembryanthemum nodiflorum*	Small Ice Plant	EX	0	0	0	0
Aizoaceae	*Sarcozona praecox*	Sarcozona	FG	0.1	3	0.1	1
Aizoaceae	*Tetragonia moorei*		FG	0	0	5	20
Aizoaceae	*Tetragonia tetragonioides*	New Zealand Spinach	FG	0	0	0	0
Aizoaceae	*Trianthema triquetra*	Small Hogweed	FG	0	0	0	0
Amaranthaceae	*Ptilotus obovatus*	Smoke Bush	SG	0	0	0	0
Anacardiaceae	*Searsia lancea*	African Sumac	EX	0	0	0	0
Apiaceae	*Daucus glochidiatus*	Native Carrot	FG	0	0	0.5	50
Apocynaceae	*Marsdenia australis*	Doubah	OG	0	0	0	0
Asphodelaceae	*Asphodelus fistulosus*	Onion Weed	EX	1	20	0	0
Asteraceae	*Brachyscome ciliaris*	Variable Daisy	FG	0.5	20	0.2	10
Asteraceae	*Calotis hispidula*	Bogan Flea	FG	0	0	0.2	10
Asteraceae	*Calotis sp.*		FG	0	0	0	0
Asteraceae	*Chrysanthemoides monilifera subsp. monilifera*	Boneseed	HTW	0	0	0	0
Asteraceae	*Chrysocephalum apiculatum*	Common Everlasting	FG	0	0	0	0
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	EX	0	0	0	0
Asteraceae	*Conyza sp.*		EX	0.1	1	0	0
Asteraceae	*Dimorphotheca ecklonis*	Cape Daisy	EX	0	0	0	0
Asteraceae	*Euchiton sp.*		FG	0	0	0	0
Asteraceae	*Helianthus annuus*	Common Sunflower	EX	0	0	0	0
Asteraceae	*Hypochaeris sp.*		EX	0	0	0	0
Asteraceae	*Lactuca serriola*	Prickly Lettuce	EX	0	0	0	0
Asteraceae	*Leiocarpa tomentosa*	Woolly Plover-daisy	FG	0	0	0	0
Asteraceae	*Leiocarpa websteri*		FG	10	50	0	0
Asteraceae	*Minuria cunninghamii*	Bush Minuria	FG	0.5	20	1	10
Asteraceae	*Olearia pimeleoides*		SG	0	0	0	0
Asteraceae	*Rhodanthe moschata*		FG	0	0	0.1	1
Asteraceae	*Senecio cunninghamii*		FG	0	0	0	0
Asteraceae	*Senecio quadridentatus*	Cotton Fireweed	FG	0	0	0	0
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	EX	0.2	10	0.2	20
Asteraceae	*Vittadinia cuneata*		FG	1	50	0.5	3
Asteraceae	*Vittadinia eremaea*		FG	0	0	0	0
Asteraceae	*Xanthium occidentale*	Noogoora Burr	HTW	0	0	0	0
Asteraceae	*Xanthium sp.*		EX	0	0	0	0
Boraginaceae	*Echium plantagineum*	Patterson's Curse	EX	0	0	0	0
Brassicaceae	*Arabidella trisecta*		SG	0	0	0	0

Family	Species Name	Common Name	Growth Form	P21982_005		P21982_022	
				VZ_11		VZ_11	
				Percent Cover	Abundance	Percent Cover	Abundance
Brassicaceae	*Carrichtera annua*	Ward's Weed	HTW	0	0	10	500
Brassicaceae	*Harmsiodoxa blennodioides*		FG	0	0	0	0
Brassicaceae	*Lepidium africanum*	Common Peppercress	EX	0	0	0	0
Brassicaceae	*Lepidium phlebopetalum*	Veined Peppercress	FG	0	0	0	0
Brassicaceae	*Sisymbrium erysimoides*	Smooth Mustard	EX	0	0	3	20
Brassicaceae	*Sisymbrium irio*	London Rocket	EX	0	0	2	50
Campanulaceae	*Isotoma petraea*	Rock Isotome	FG	0	0	0	0
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	FG	0	0	0	0
Chenopodiaceae	*Atriplex angulata*	Fan Saltbush	SG	0	0	0	0
Chenopodiaceae	*Atriplex conduplicata*		SG	0	0	0	0
Chenopodiaceae	*Atriplex holocarpa*	Pop Saltbush	FG	0	0	0	0
Chenopodiaceae	*Atriplex limbata*		FG	0	0	0.2	5
Chenopodiaceae	*Atriplex lindleyi*	Eastern Flat-top Saltbush	FG	0	0	0	0
Chenopodiaceae	*Atriplex nummularia*	Old Man Saltbush	SG	30	100	25	50
Chenopodiaceae	*Atriplex stipitata*	Mallee Saltbush	SG	0	0	0	0
Chenopodiaceae	*Atriplex vesicaria*	Bladder Saltbush	SG	0	0	0	0
Chenopodiaceae	*Chenopodium cristatum*	Crested Goosefoot	FG	0	0	0	0
Chenopodiaceae	*Chenopodium desertorum*	Desert Goosefoot	SG	0	0	0	0
Chenopodiaceae	*Dissocarpus biflorus var. biflorus*		SG	0	0	0	0
Chenopodiaceae	*Dissocarpus paradoxus*	Cannonball Burr	SG	0	0	2	50
Chenopodiaceae	*Dysphania cristata*	Crested Crumbweed	FG	0	0	0	0
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	FG	0	0	0	0
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing Saltbush	FG	0	0	0	0
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	SG	0	0	0	0
Chenopodiaceae	*Maireana brevifolia*		SG	1	20	0	0
Chenopodiaceae	*Maireana decalvans*	Black Cotton Bush	SG	0	0	0	0
Chenopodiaceae	*Maireana georgei*	Slit-wing Bluebush	SG	0	0	0	0
Chenopodiaceae	*Maireana integra*		SG	0	0	0	0
Chenopodiaceae	*Maireana pyramidata*	Black Bluebush	SG	0	0	0	0
Chenopodiaceae	*Maireana sclerolaenoides*		SG	0	0	0	0
Chenopodiaceae	*Maireana sedifolia*	Pearl Bluebush	SG	0	0	0	0
Chenopodiaceae	*Maireana sp.*	Cotton Bush, Bluebush, Fissure-weed	SG	0	0	0	0
Chenopodiaceae	*Maireana triptera*	Three-wing Bluebush	SG	0	0	0	0
Chenopodiaceae	*Osteocarpum acropterum var. deminutum*	Bonefruit	SG	1	50	0	0
Chenopodiaceae	*Rhagodia spinescens*	Thorny Saltbush	SG	1	5	2	10
Chenopodiaceae	*Salsola australis*		SG	0	0	2	20
Chenopodiaceae	*Sclerolaena brachyptera*	Short-winged Copperburr	SG	1	50	0	0
Chenopodiaceae	*Sclerolaena diacantha*	Grey Copperburr	SG	0.1	1	1	20

Family	Species Name	Common Name	Growth Form	P21982_005		P21982_022	
				VZ_11		VZ_11	
				Percent Cover	Abundance	Percent Cover	Abundance
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	SG	0	0	0	0
Chenopodiaceae	*Sclerolaena eriacantha*	Silky Copperburr	SG	0	0	0	0
Chenopodiaceae	*Sclerolaena lanicuspis*	Woolly Copperburr	SG	0	0	0	0
Chenopodiaceae	*Sclerolaena limbata*		SG	0	0	1	20
Chenopodiaceae	*Sclerolaena obliquicuspis*		SG	0	0	7	30
Chenopodiaceae	*Sclerolaena tricuspis*	Giant Redburr	SG	0	0	0	0
Chenopodiaceae	*Sclerolaena ventricosa*	Salt Copperburr	SG	0.1	1	0	0
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	OG	0	0	0.2	5
Convolvulaceae	*Convolvulus remotus*		OG	5	50	0	0
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	FG	0	0	0	0
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis*	Paddy Melon	EX	0	0	0.1	1
Cyperaceae	*Cyperus gymnocaulos*		GG	0	0	0	0
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	FG	0	0	0.2	10
Euphorbiaceae	*Euphorbia peplus*	Petty Spurge	EX	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis*		SG	0	0	0	0
Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*		SG	0	0	0	0
Euphorbiaceae	*Ricinus communis*	Castor Oil Plant	HTW	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides*		SG	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides <--> zygophylla*		SG	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. filifolia*		SG	0	0	0	0
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. X artemisioides*		SG	0	0	0	0
Fabaceae (Faboideae)	*Cullen cinereum*	Annual Verbine	FG	0	0	0	0
Fabaceae (Faboideae)	*Glycine canescens*	Silky Glycine	OG	0	0	0	0
Fabaceae (Faboideae)	*Lotus australis*	Australian Trefoil	FG	0	0	10	20
Fabaceae (Faboideae)	*Lotus cruentus*	Red-flowered Lotus	FG	0	0	0	0
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	EX	0	0	0	0
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	EX	0	0	0	0
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	EX	10	500	0	0
Fabaceae (Faboideae)	*Medicago sp.*		EX	0	0	0	0
Fabaceae (Faboideae)	*Swainsona fissimontana*		FG	0	0	0	0
Fabaceae (Faboideae)	*Swainsona formosa*	Sturt's Desert Pea	FG	0	0	0	0
Fabaceae (Faboideae)	*Vicia monantha*	Square-stemmed Vetch	EX	0.1	5	0	0
Fabaceae (Mimosoideae)	*Acacia aneura*	Mulga	SG	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia brachystachya*	Umbrella Mulga	SG	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia oswaldii*	Miljee	TG	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia salicina*	Cooba	TG	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia tetragonophylla*	Dead Finish	SG	0	0	0	0
Fabaceae (Mimosoideae)	*Acacia victoriae*		SG	0.1	1	0	0

Family	Species Name	Common Name	Growth Form	P21982_005		P21982_022	
				VZ_11		VZ_11	
				Percent Cover	Abundance	Percent Cover	Abundance
Fabaceae (Mimosoideae)	*Prosopis velutina*	Velvet Mesquite	HTW	0	0	0.2	1
Fumariaceae	*Fumaria capreolata*	Climbing Fumitory	EX	0	0	0	0
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	FG	0	0	0	0
Goodeniaceae	*Goodenia berardiana*		FG	0	0	0	0
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	FG	0	0	0	0
Goodeniaceae	*Goodenia sp.*		FG	0	0	0	0
Goodeniaceae	*Scaevola spinescens*		SG	0	0	0	0
Lamiaceae	*Prostanthera striatiflora*	Jockey's Cap	SG	0	0	0	0
Lamiaceae	*Salvia sp.*		FG	0	0	0	0
Loranthaceae	*Amyema maidenii*		OG	0	0	0	0
Malvaceae	*Abutilon fraseri*	Dwarf Lantern-flower	FG	0	0	0	0
Malvaceae	*Abutilon halophilum*		SG	0	0	0	0
Malvaceae	*Hibiscus sturtii*	Hill Hibiscus	FG	0	0	0	0
Malvaceae	*Malva parviflora*	Small-flowered Mallow	EX	0	0	0.1	1
Malvaceae	*Malvastrum americanum*	Spiked Malvastrum	EX	0	0	0	0
Malvaceae	*Sida corrugata*	Corrugated Sida	FG	0	0	0	0
Malvaceae	*Sida fibulifera*	Pin Sida	FG	0.1	1	0.1	1
Malvaceae	*Sida intricata*		SG	0.2	10	0.1	1
Malvaceae	*Sida petrophila*		SG	0	0	0	0
Meliaceae	*Melia azedarach*	White Cedar	TG	0	0	0	0
Myoporaceae	*Eremophila serrulata*	Green Fuchsia Bush	SG	0	0	0	0
Myoporaceae	*Myoporum montanum*	Western Boobialla	SG	0.1	1	0	0
Myrtaceae	*Eucalyptus camaldulensis*	River Red Gum	TG	0	0	0	0
Nyctaginaceae	*Boerhavia dominii*	Tarvine	FG	0	0	0	0
Oxalidaceae	*Oxalis perennans*		FG	0	0	0	0
Plantaginaceae	*Plantago cunninghamii*	Sago-weed	FG	0	0	0	0
Plantaginaceae	*Plantago sp.*	Plantain	FG	0	0	0.2	20
Plumbaginaceae	*Limonium lobatum*	Winged Sea Lavender	EX	0	0	0	0
Plumbaginaceae	*Limonium sinuatum*	Perennial Sea Lavender	EX	0	0	0.2	2
Poaceae	*Aristida contorta*	Bunched Kerosene Grass	GG	0	0	0	0
Poaceae	*Aristida personata*		GG	0	0	0	0
Poaceae	*Arundo donax*	Giant Reed	HTW	0	0	0	0
Poaceae	*Austrostipa nitida*		GG	10	100	1	10
Poaceae	*Austrostipa nodosa*		GG	0	0	0	0
Poaceae	*Chloris gayana*	Rhodes Grass	HTW	0.1	1	0	0
Poaceae	*Cymbopogon ambiguus*	Lemon Grass	GG	0	0	0	0
Poaceae	*Cynodon dactylon*	Common Couch	GG	0	0	0	0
Poaceae	*Dactyloctenium radulans*	Button Grass	GG	0	0	0	0

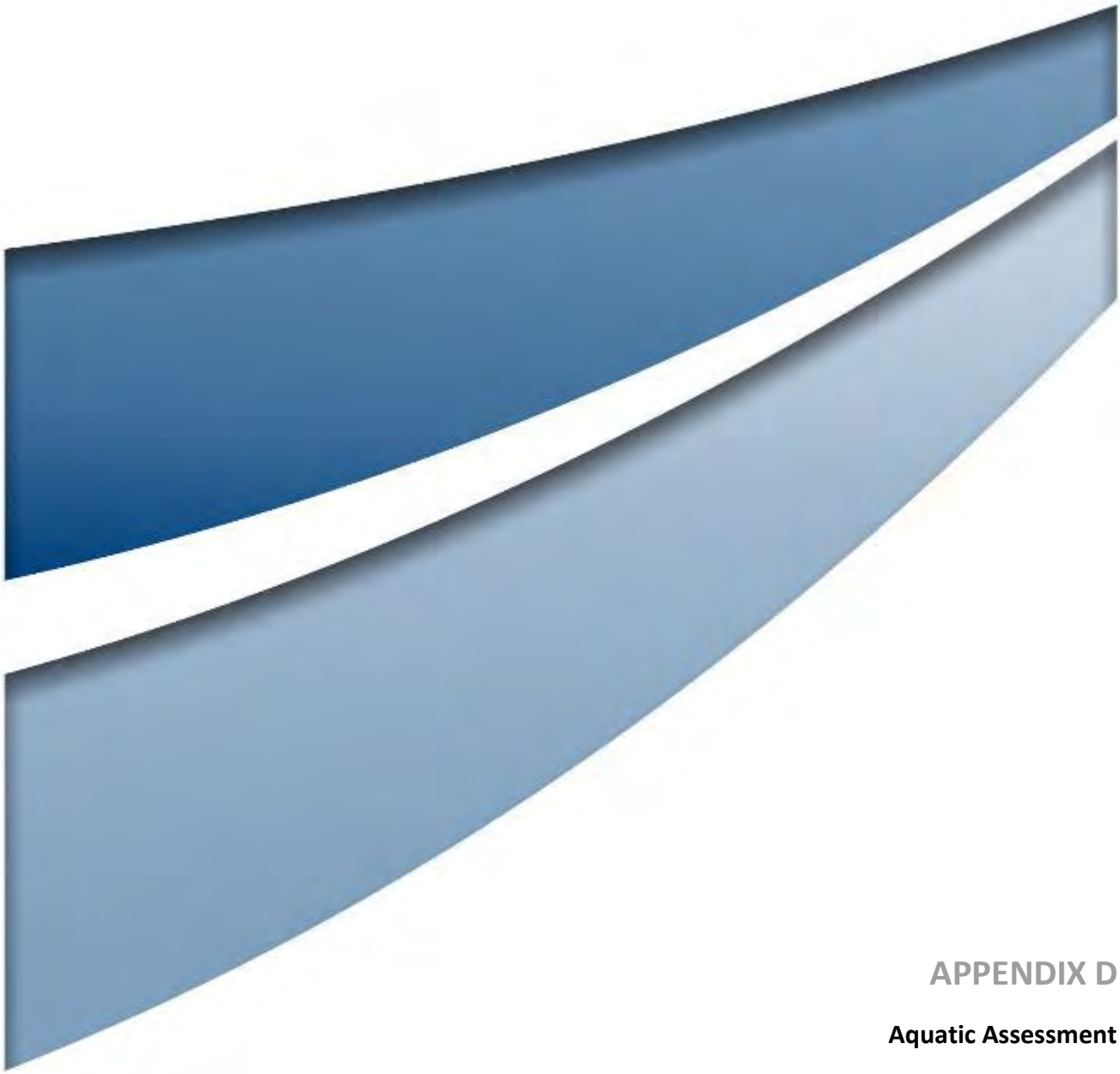
Family	Species Name	Common Name	Growth Form	P21982_005		P21982_022	
				VZ_11		VZ_11	
				Percent Cover	Abundance	Percent Cover	Abundance
Poaceae	*Dichanthium sericeum subsp. sericeum*	Queensland Bluegrass	GG	0	0	0	0
Poaceae	*Digitaria brownii*	Cotton Panic Grass	GG	0	0	0	0
Poaceae	*Digitaria coenicola*	Finger Panic Grass	GG	0.5	10	0	0
Poaceae	*Enneapogon avenaceus*	Bottle Washers	GG	0	0	0	0
Poaceae	*Enneapogon intermedius*		GG	0.5	20	0.1	1
Poaceae	*Enneapogon sp.*	Nineawn Grass, Bottlewashers	GG	0	0	0	0
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	GG	0	0	0	0
Poaceae	*Eragrostis cilianensis*	Stinkgrass	EX	0	0	0	0
Poaceae	*Eragrostis dielsii*	Mallee Lovegrass	GG	0.1	1	0	0
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	GG	0	0	0	0
Poaceae	*Eragrostis sp.*		GG	0	0	0	0
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	GG	0	0	0	0
Poaceae	*Piptatherum miliaceum*	Rice Millet	EX	0	0	0	0
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	GG	0.5	20	0	0
Poaceae	*Sporobolus caroli*	Fairy Grass	GG	0.1	1	0	0
Poaceae	*Thyridolepis mitchelliana*	Mulga Mitchell Grass	GG	0	0	0	0
Polygonaceae	*Rumex crispus*	Curled Dock	EX	0	0	0	0
Polygonaceae	*Rumex vesicarius*	Bladder Dock	EX	0	0	0	0
Portulacaceae	*Portulaca oleracea*	Pigweed	FG	0	0	0	0
Portulacaceae	*Portulaca sp.*		FG	0	0	0	0
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	EX	0	0	0	0
Pteridaceae	*Cheilanthes lasiophylla*		EG	0	0	0	0
Pteridaceae	*Cheilanthes sieberi subsp. sieberi*	Rock Fern	EG	0	0	0	0
Rubiaceae	*Galium aparine*	Goosegrass	EX	0	0	0	0
Santalaceae	*Santalum acuminatum*	Sweet Quandong	SG	0	0	0	0
Sapindaceae	*Dodonaea lobulata*		SG	0	0	0	0
Sapindaceae	*Dodonaea viscosa subsp. angustissima*	Narrow-leaf Hop-bush	SG	0	0	0	0
Solanaceae	*Lycium australe*	Australian Boxthorn	SG	0	0	0.5	1
Solanaceae	*Lycium ferocissimum*	African Boxthorn	HTW	0	0	0	0
Solanaceae	*Solanum ellipticum*	Velvet Potato Bush	FG	0	0	0	0
Solanaceae	*Solanum esuriale*	Quena	FG	0	0	0	0
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	EX	0	0	0.2	1
Solanaceae	*Solanum sturtianum*	Thargomindah Nightshade	SG	0	0	0	0
Verbenaceae	*Glandularia aristigera*	Mayne's Pest	EX	0	0	0	0
Verbenaceae	*Verbena africana*		EX	0	0	0	0
Zygophyllaceae	*Roepera eremaea*	Climbing Twinleaf	FG	0	0	0	0
Zygophyllaceae	*Zygophyllum iodocarpum*	Violet Twinleaf	FG	0	0	0	0



APPENDIX C

Vegetation Integrity Data

Plot	COMPOSITION						STRUCTURE						FUNCTION										
	Tr	Sh	Gr	Fb	Fn	Ot	Tr	Sh	Gr	Fb	Fn	Ot	Regen	Stem Classes (cm)					No. Large Trees	No. Hollow Trees	Litter (%)	Fallen Logs (m)	High Threat Weeds
													>5	5–10	10–20	20–30	30–50	50–80					
P21982_021 VZ_1	1	13	6	10	0	1	10	27.1	25.9	12.2	0	1	0	1	1	0	0	0	0	0	3.8	0	10.2
P21982_019 VZ_2	3	6	1	0	0	1	45.5	31.2	5	0	0	0.2	0	1	1	1	1	0	0	0	36	0	1.6
P21982_006 VZ_3	1	7	6	6	0	0	10	32.8	15.7	6.1	0	0	0	1	1	0	0	0	0	0	2	2	0.5
P21982_011 VZ_4	0	13	2	5	0	1	0	21.4	65	3.3	0	0.1	0	0	0	0	0	0	0	0	5.4	0	1
P21982_004 VZ_5	0	12	3	4	0	1	0	45.7	11	1.8	0	0.1	0	0	0	0	0	0	0	0	1.8	0	0.5
P21982_008 VZ_5	0	15	4	8	0	2	0	29.5	21.1	2.7	0	0.2	0	0	0	0	0	0	0	0	16.4	0	0.2
P21982_016 VZ_5	0	7	4	8	2	0	0	22	25.6	8.8	0.6	0	0	0	0	0	0	0	0	0	26	1	2
P21982_017 VZ_5	0	11	5	6	0	0	0	29.9	45.7	8.6	0	0	0	0	0	0	0	0	0	0	16.4	0	5
P21982_018 VZ_5	0	12	2	7	0	3	0	29.7	35	3.8	0	0.3	0	0	0	0	0	0	0	0	13.2	0	10
P21982_031 VZ_5	0	15	6	3	0	0	0	36	31.3	0.5	0	0	0	1	1	0	0	0	0	0	8	0	5
P21982_032 VZ_5	0	14	5	6	0	0	0	37.8	16.1	1	0	0	0	1	1	0	0	0	0	0	7	0	5
P21982_033 VZ_5	0	15	4	5	1	0	0	67.7	40	1.5	0.1	0	0	1	1	1	0	0	0	0	6	20	10
P21982_023 VZ_6	0	7	3	6	0	0	0	21	10.1	2.1	0	0	0	1	0	0	0	0	0	0	0.2	0	4.5
P21982_024 VZ_6	1	10	4	6	0	0	0.1	47.9	1.7	1.1	0	0	0	0	0	0	0	0	0	0	1	0	11.4
P21982_003 VZ_7	0	10	6	12	0	1	0	55.2	17.2	5	0	0.1	1	0	0	0	0	0	0	0	1.6	2	2
P21982_010 VZ_7	0	12	5	12	0	1	0	35.6	12.4	9.2	0	0.1	1	0	0	0	0	0	0	0	6.4	0	5
P21982_029 VZ_7	0	13	2	10	0	1	0	30.3	10	2.4	0	0.1	0	0	0	0	0	0	0	0	5	0	5
P21982_030 VZ_7	0	12	3	9	0	0	0	23.5	16	11.8	0	0	0	0	0	0	0	0	0	0	4.4	0	5
P21982_012 VZ_8	0	16	3	12	0	1	0	17.5	50	8.1	0	0.1	0	0	0	0	0	0	0	0	7.6	2	0.7
P21982_013 VZ_8	0	16	3	6	0	1	0	19.5	45	12	0	0.2	0	0	0	0	0	0	0	0	7.8	10	10
P21982_014 VZ_9	0	13	2	6	0	0	0	26.9	2.5	20.9	0	0	1	0	0	0	0	0	0	0	8.4	6	15
P21982_015 VZ_9	0	13	2	10	0	1	0	25.9	1.5	2.5	0	0.2	0	0	0	0	0	0	0	0	2.2	0	40
P21982_001 VZ_10	0	10	4	6	1	0	0	36.4	1.3	0.7	0.1	0	1	0	0	0	0	0	0	0	1.6	2	0.2
P21982_002 VZ_10	0	14	2	6	0	1	0	58.5	10	1.5	0	0.1	1	0	0	0	0	0	0	0	1.4	36	0.5
P21982_007 VZ_10	0	14	3	12	0	0	0	63.1	1.2	1.8	0	0	0	0	0	0	0	0	0	0	1.2	0	0.5
P21982_009 VZ_10	0	16	3	8	0	0	0	66.7	5.7	1.4	0	0	0	0	0	0	0	0	0	0	5.2	5	0
P21982_020 VZ_10	0	12	2	11	0	0	0	65	16	1.8	0	0	0	0	0	0	0	0	0	0	11.6	0	0.5
P21982_025 VZ_10	0	20	2	11	0	1	0	69.2	20	6.4	0	0.1	0	0	0	0	0	0	0	0	2.8	0	5
P21982_026 VZ_10	0	11	2	4	0	1	0	10.5	11	0.9	0	0.1	0	0	0	0	0	0	0	0	3.6	0	5
P21982_027 VZ_10	0	15	2	5	0	0	0	8.3	2	0.6	0	0	0	0	0	0	0	0	0	0	2.6	0	0.5
P21982_028 VZ_10	0	11	2	4	0	0	0	8.5	1.1	0.6	0	0	0	0	0	0	0	0	0	0	2	0	5
P21982_005 VZ_11	0	10	6	6	0	1	0	34.6	11.7	12.2	0	5	0	0	0	0	0	0	0	0	0.6	0	0.1
P21982_022 VZ_11	0	9	2	13	0	1	0	40.6	1.1	18.3	0	0.2	0	0	0	0	0	0	0	0	18	0	10.2



APPENDIX D

Aquatic Assessment

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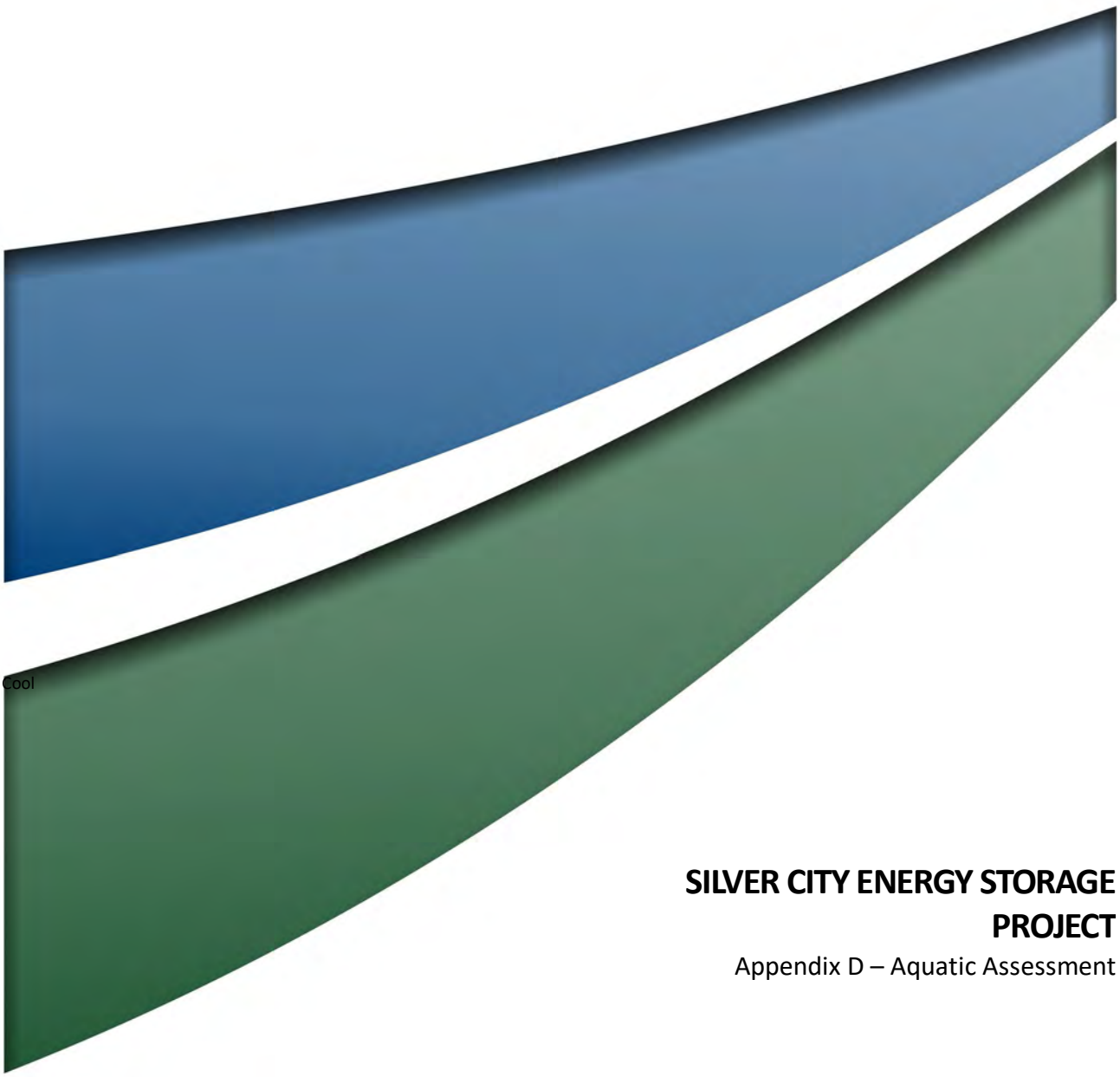

SILVER CITY ENERGY STORAGE PROJECT

Appendix D – Aquatic Assessment

FINAL

August 2023

SILVER CITY ENERGY STORAGE PROJECT

Appendix D – Aquatic Assessment

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
A-CAES NSW Pty Ltd

Project Director: John Merrell
Project Manager: Penelope Williams
Technical Director: Ryan Parsons
Technical Manager: Dayna Mitchell
Report No. 21982 R04 – Appendix D
Date: August 2023

umwelt
Environmental & Social Consultants

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
Final	Penelope Williams Ryan Parsons	10 August 2023	John Merrell	10 August 2023

Executive Summary

The aquatic ecological assessment for the Project has been prepared based on a combination of field investigations and a review of available aerial photographs, topographic maps, databases, literature, policies and guidelines. The Project crosses several un-named watercourses. While the watercourses are between first and third order streams, they are characterised by ephemeral patterns of flow and water levels exacerbated by heavily cleared catchments and prevalence of agricultural and mining land uses. Waterways were classified in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013) and un-named tributaries occurring within the Project Area have been classified as not sensitive and are not considered key fish habitat.

No habitat for threatened fish species or aquatic ecological communities as listed under the *Fisheries Management Act 1994* (FM Act) or Commonwealth *Environment Biodiversity and Conservation Act 1999* (EPBC Act) was identified as occurring or having potential to occur in the Project Area. Adverse surface water and groundwater impacts are not predicted to adversely affect potential habitat for threatened freshwater fish species.

The Project is not expected to result in adverse surface water impacts in the downstream environments of the Project Area. Therefore, the Project is not expected to have an adverse effect on downstream surface water resources such that aquatic biodiversity would be adversely impacted. Overall, no aquatic biodiversity is anticipated to be materially adversely impacted due to the Project.

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Figures

1.0 Introduction

1.1 Project Overview

Umwelt was engaged by A-CAES NSW Pty Ltd (the Proponent) a wholly owned subsidiary of Hydrostor Australia Holdings Pty Ltd to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed Silver City Storage Project (the Project), co-located at the Potosi Mine, located approximately 3 km north-east of Broken Hill.

The Project will involve the establishment of an Advanced Compressed Air Energy Storage (ACAES) facility to provide large-scale, long duration energy storage for the National Energy Market (NEM) and provide backup supply for the Broken Hill electricity network. The Project will include the construction of a 250,000 m^3 underground cavern, utilising the existing Silver Peak or Potosi Mine portals for subsurface access. Refer to Figure 1.1 of the BDAR for locality.

For the purposes of the biodiversity assessment the Subject Land is the Project design footprint and includes all proposed impact works of the Project, spanning 47.61 ha (refer to Figure 1.3 of the BDAR). While the direct impacts of the Project are limited to the Subject Land, the wider Project Area is included in this assessment.

1.2 Project Design

The Project includes the installation, operation and maintenance of the Silver City Energy Storage Facility (SCES Facility) and ancillary infrastructure associated with the construction and operation of the Project. The SCES Facility includes the construction of additional surface infrastructure, including a 350 megalitre water storage reservoir, air shaft, water shaft and sump, turbines, compressors, heat storage spheres, an office, laydown area, switchyard and associated facilities. A 220 kV Transmission line is also proposed (approximately 16 km long) and a raw water supply pipeline, connecting to the existing Stephens Creek Reservoir to Broken Hill raw water pipeline.

The Project surface facilities will encroach on a third order tributary of Willa Willyong Creek on the north-western side of the Reservoir. The Project will also require the diversion of an approximately 900 m long reach of the north easterly draining waterway commencing at the south-western corner of the Project.

1.3 Purpose and Scope of This Report

This aquatic assessment has been prepared as part of the BDAR documentation for the Project to address the Secretary's Environmental Assessment Requirements (SEARs) in relation to Biodiversity. This Report provides an assessment of the aquatic biodiversity values of the Project Area, documents the application of the avoid, minimise and offset framework and assesses the likely aquatic biodiversity impacts of the Project.

Specifically, this assessment:

- describes the existing aquatic environment in terms of ecological values, including type and condition of aquatic habitats
- determines the presence or likelihood of occurrence of threatened species, populations and Endangered Ecological Communities (EECs) as listed under the *Fisheries Management Act 1994* (FM Act)
- determines the presence or likelihood of occurrence of matters of national environmental significance (MNES) as listed under the *Environment Biodiversity and Conservation Act 1999* (EPBC Act), relevant to the aquatic environment
- identifies threatened fish species, populations and ecological communities within the Project Area that have the potential to be impacted by the Project
- assesses the impact of the Project on aquatic species and ecosystems
- provides measures to mitigate any direct or indirect impacts to the aquatic ecology of the Project Area and downstream environments.

1.4 Existing Environment

1.4.1 Topography and Hydrology

The topography of the Project Area varies between 260 mAHD and 300 mAHD along the proposed transmission alignment, predominately gently undulating with areas of steeper slopes associated with the rocky outcropping and hills.

The Project Area is located within the broader Darling River catchment and the Project SCES Facility is located within the immediate catchment of Willa Willyong Creek which drains in a north-easterly direction to Stephens Creek Reservoir (refer to **Figure D1**). Stephens Creek Reservoir is located approximately 6 km to the north-east of the SCES Facility and serves as the backup water supply for Broken Hill.

There are two third order streams in or near the proposed SCES Facility including the third order tributary of Willa Willyong Creek that will be diverted by the Project (refer to **Figure D1**).

The Project transmission line route runs from the SCES Facility around the south-western side of the Broken Hill township to the existing Transgrid sub-station (approximately 16 km south-west of the surface facilities). The transmission line route passes through the catchments of Willa Willyong Creek (fourth order stream), Kellys Creek (fourth order stream) and Acacia Creek (third order a tributary of Kellys Creek) (refer to **Figure D1**). Kellys Creek is a tributary of Stirling Vale Creek which is in turn a tributary of Pine Creek which drains in a south-easterly direction toward the Darling River which is approximately 100 km to the south-east of the Project Area.

The transmission line alignment traverses a number of unnamed first, second and third order tributaries to Willa Willyong Creek, Kellys Creek and Acacia Creek (refer to Figure 1.1 of the BDAR).

NSW Government hydroline mapping indicates that all streams within the Project Area and immediately downstream (including Willa Willyong Creek, Kellys Creek and Acacia Creek) are ephemeral.

1.4.2 Climate

The climate within the Project Area is arid, with rainfall and evaporation highest from October to March. On average, January is the wettest month and August is the driest month. Regionally, January is typically the warmest month, with July the coolest. Prevailing winds are generally from the south and north to northeast during the morning period and south to west and northwest during the afternoon period. Wind speed is generally lowest in the autumn months and strongest in the spring months.

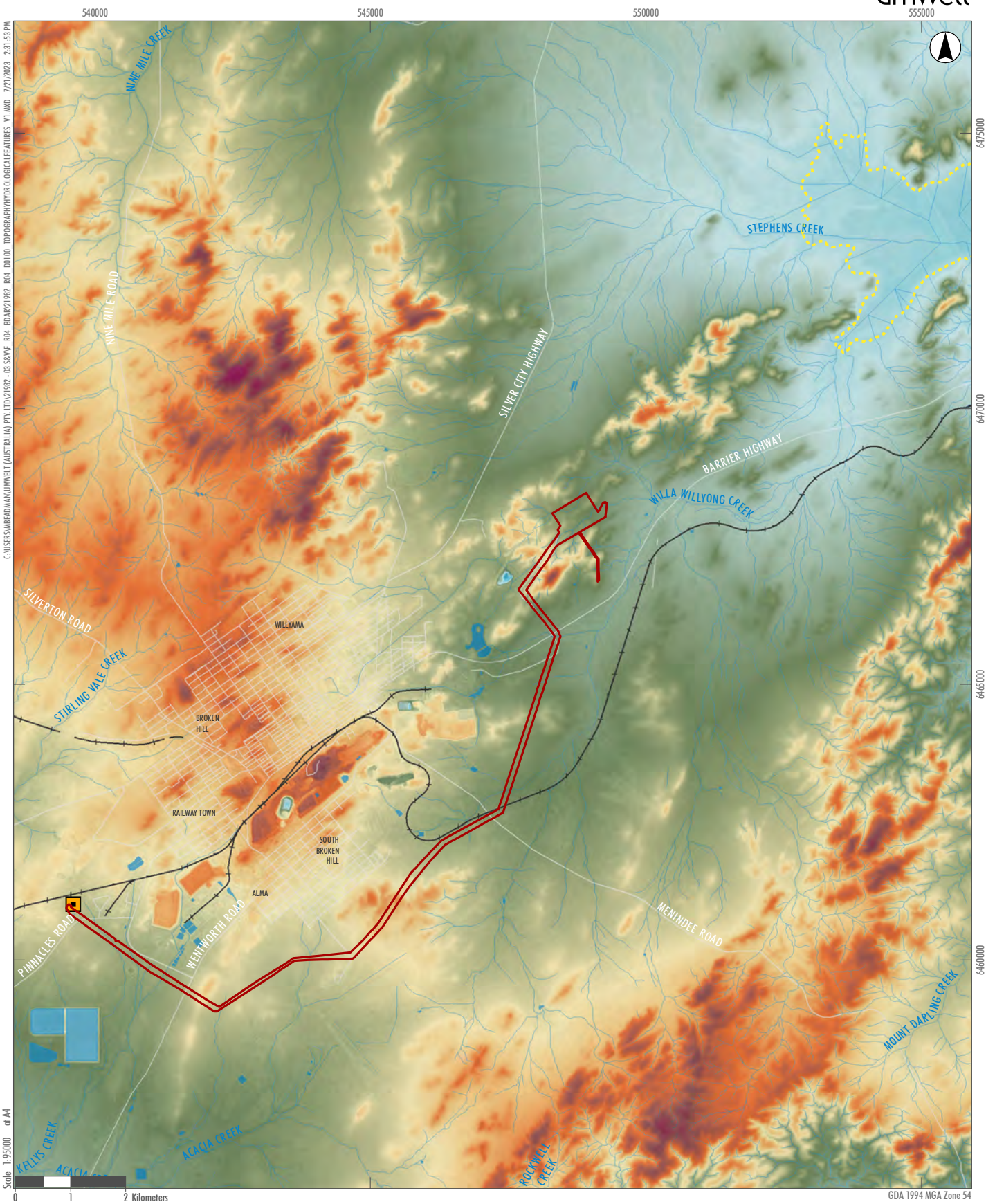
The average rainfall and evaporation for the Project Area are typically higher in the summer months and lower in the winter months. The average annual evaporation across the Project Area is indicated as approximately 2,400 mm.

1.4.3 Vegetation

The Project Area largely comprises areas that have previously been disturbed and historically cleared for mineral extraction purposes. Six different plant community types (PCTs) have been mapped within the Project Area in the BDAR, including:

- PCT41 River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone along some of the waterways in the transmission line alignment
- PCT123 Mulga – Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion
- PCT136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone along some of the waterways in the transmission line alignment
- PCT150 Bottlewasher – Copperburr grassland of the arid zone
- PCT155 Bluebush shrubland on stony rises and downs in the arid and semi-arid zones
- PCT 158 Old Man Saltbush – mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW).

Fauna habitat within the Project Area is limited. Surveys across the Project Area have detected no large hollow bearing trees. Some low-lying rocky habitat has been detected. The Project Area has been subject to various degrees of disturbance associated with historic mining and industrial land use and multiple areas are also subject to rubbish dumping. The waterways generally have a high level of exotic flora species present. Overall, the Project Area is dominated by native remnant arid land vegetation.



Legend

- Project Area
- Transgrid Substation
- Stephens Creek Reservoir
- Water Storage
- Drainage Line
- Railway Line
- Road

Modelled Terrain
High : 422m
Low : 197m

FIGURE D1

Topography and Hydrological Features

Image Source: ESRI Basemap (2022); Nearmap (2022) Data source: DFSI (2023)

1.5 Statutory Context, Policy and Guidelines

1.5.1 NSW Environmental Planning and Assessment Act 1979

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Environmental Planning and Assessment Regulation 2021 (the Regulation) provide the framework for development assessment in NSW. The EP&A Act and the Regulation include provisions to ensure that the potential environmental impacts of a development are considered in the decision-making process prior to proceeding to construction.

1.5.2 NSW Fisheries Management Act 1994

The FM Act provides for the conservation, protection and management of fisheries, aquatic systems and habitats in NSW. The FM Act establishes mechanisms for:

- the listing of threatened species, populations and ecological communities or key threatening processes
- the declaration of critical habitat
- consideration and assessment of threatened species impacts in the development assessment process.

Section 3.2.1 of this report identifies threatened species, populations and communities with potential to occur in the Project Area and **Section 4.0** of this report assesses likely impacts of the Project.

Division 3 of the FM Act provides for the conservation of the biodiversity of fish and aquatic vegetation and protection of fish habitat though management of dredging and reclamation works. Upgrades of waterway structures such as bridges or culverts and the upgrade or construction of waterway crossings would require 'dredging' (excavation of water / land or removal of material from water / land) or 'reclamation' (using material to fill/reclaim or depositing material to construct anything other than water / land). **Section 3.2** of this report describes aquatic habitats and **Section 4.0** describes the impacts of the proposed works within the waterways.

1.5.3 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the primary piece of Federal legislation relating to the environment. Under the EPBC Act any 'action' that is, has, or is likely to have, a significant impact on a matter of national environmental significance (MNES) requires approval from the Commonwealth Minister for the Environment. An 'action' is defined as a project, development, undertaking, activity (or series of activities), or alteration of any of these. MNES are:

- listed threatened species and communities
- migratory species protected under international agreements
- Ramsar wetlands of international importance
- the Commonwealth marine environment
- World Heritage properties

- National Heritage places
- Great Barrier Reef Marine Park
- nuclear actions and
- a water resource, in relation to coal seam gas development and large coal mining development.

A referral was submitted to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 27 February 2023, and the Project was determined to not be a controlled action on 20 June 2023 and therefore as not having a significant impact on any MNES.

1.5.4 Secretary's Environmental Assessment Requirements

The Project SEARs specifically require *an assessment of the indirect impacts on listed aquatic threatened species, populations or ecological communities scheduled under the Fisheries Management Act 1994 (if required), and a description of the measures to minimise and rehabilitate impacts, including impacts to Willa Willyong Creek.*

This report assesses the potential impacts of the Project on aquatic biodiversity as required by the SEARs.

2.0 Methods

2.1 Literature and Database Review

The following ecological database searches were undertaken as part of the BDAR and this assessment to determine whether threatened species or aquatic communities as listed under the BC Act and/or EPBC Act had been previously identified in the Project Area and locality:

- a 10 km buffer search from the Project Area from the DCCEEW Protected Matters Search Tool (accessed May 2023)
- a search of the Broken Hill local government area (LGA) using the DPI threatened species distribution maps (DPI 2023a) Key Fish Habitat mapping as prepared by DPI
- a search of the groundwater dependent ecosystems atlas (BOM 2023)
- BioNet Atlas database search (DPE 2023).

The information obtained was used to assist in the description of ecological context, assessment of potentially occurring threatened species, endangered populations (EPs) and Threatened Ecological Communities (TECs).

2.2 Aquatic Habitat Survey

Preliminary mapping of the broad scale aquatic habitats within the Project Area was undertaken using recent aerial photography in conjunction with topographic maps prior to field surveys. Topographic maps were used to gain a broad understanding of catchment characteristics including adjacent land use, elevation, access routes, distance from source and location of barriers to fish passage, such as dams and weirs. Qualitative assessments of aquatic habitat were undertaken as part of vegetation surveys.

2.3 Key Fish Habitat Assessment

The type/sensitivity of fish habitat and classification of waterways was assessed based on the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013). These guidelines focus on promoting compliance with legislation relating to fish habitat conservation and management and are used for assessing developments and activities affecting fish habitats.

It is noted that the guidelines do not consider first and second order streams on gaining streams, farm dams on first and second order streams or agricultural drains to be key fish habitat.

2.3.1 Habitat Sensitivity Type

These guidelines provide sensitivity scheme which defines three types of habitats, these are:

- Type 1 Highly Sensitive Key Fish Habitat
- Type 2 Moderately Sensitive Key Fish Habitat
- Type 3 Minimally Sensitive Key Fish Habitat.

2.3.2 Waterway Class

These Guidelines further provide a Waterway Classification Scheme which includes the following four classes:

- Class 1 Major Key Fish Habitat
- Class 2 Moderate Key Fish Habitat
- Class 3 Minimal Key Fish Habitat
- Class 4 Unlikely Key Fish Habitat.

3.0 Results

3.1 Database Search Results

3.1.1 Fisheries NSW Spatial Data Portal

A review of the Fisheries NSW Spatial Data Portal was undertaken to identify mapped areas of key fish habitats, condition of freshwater fish communities and freshwater fish threatened species habitat in the Project Area.

3.1.1.1 Condition of Freshwater Fish Communities

The spatial data portal identifies the condition of freshwater fish communities in NSW and ranks the waterways condition. The spatial data portal has not mapped the condition of freshwater fish communities in the waterways in the Project Area or any of the named creeks downstream of the transmission line. The nearest mapped fish community is assessed as 'fair' in the downstream reaches of Stephens Creek near Kinchega National Park about 60 km downstream of Stephens Creek Reservoir.

3.1.1.2 Key Fish Habitat

The spatial data portal does not map any key fish habitat in the Project Area**.** The nearest mapped key fish habitat is Stephens Creek and Stephens Creek Reservoir downstream of the surface facilities.

3.1.1.3 BC Act listed Freshwater Fish Threatened Species Habitat Maps

The freshwater fish threatened species habitat maps prepared by DPI were reviewed for the watercourses which occur in or intersect the Project Area. The maps did not identify the presence of any habitat for threatened species or other species listed within the FM Act, within the Project Area.

3.1.2 DCCEEW Results

The DCCEEW PMST identified known presence of the threatened Murray Cod (*Maccullochella peelii*) in the Imperial Lake reservoir within the 10 km buffer.

The Murray Cod occurs in the warm water habitats (rocky streams to slow flowing turbid rivers and billabongs) with instream woody structures in the Murray-Darling Basin. There are no permanent waterways in the Project Area and it is unlikely that this species will occur within the Project Area.

3.2 Aquatic Habitat in the Project Area

Rapid qualitative aquatic habitat assessments were conducted across the Project Area whenever waterways were encountered, to characterise the type and quality of aquatic habitats.

As summarised in **Section 1.4.1** stream orders within the Project Area include:

- first to third order streams along the transmission line alignment
- two third order streams within the surface facility area including the stream to be diverted.

All watercourses within the Project Area were dry at the time of inspection and are identified as ephemeral.

Minimal to absent aquatic habitat exists within the extent of the Project Area due to the highly ephemeral watercourses.

DPI Fisheries define key fish habitat as most permanent and semi-permanent freshwater habitats up to the top of the bank, excluding headwater creeks and gullies. Within the Project Area:

- the first and second order streams along the transmission line are not key fish habitat
- third order streams may meet definition of key fish habitat as semi-permanent, following rainfall events.

The third order streams are classified as class 4 unlikely key fish habitat, that is dry gullies or shallow floodplain depressions with intermittent flow following rainfall events only, little or no defined channel, little or no flow or free-standing water.

The third order streams are Type 3 minimally sensitive key fish habitat being ephemeral aquatic habitat no supporting native aquatic or wetland vegetation.

Photo 3.1 to **Photo 3.3** illustrate the channel and plant community types along the third order stream that will be diverted by the project.

Photo 3.1 Narrow channel with exposed bedrock in the third order stream proposed for diversion

Photo 3.2 PCT 136 Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone along the third order stream to be diverted by the Project

Photo 3.3 Bedrock in stream in the third order stream proposed for diversion

3.2.1 Threatened Species, Populations and Ecological Communities

As discussed above, aquatic habitats in the Project Area are classed as unlikely, minimal sensitivity key fish habitat due to the highly ephemeral nature of the waterways located within the Project Area. The Project Area is unlikely to provide habitat for any threatened fish species.

A review of the Threatened Ecological Communities (TECs) as listed under the FM Act identifies that the Project Area occurs within the mapped area of the Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River Endangered Ecological Community (EEC). The area covered by the determination includes all natural creeks, rivers, streams and associated lagoons, billabongs, lakes, flow diversions to anabranches, the anabranches, and the floodplains of the Darling River including the Menindee lakes and the Barwon River. This area includes the main channels and tributaries of the lower Darling and Barwon-Darling Rivers from Mungindi to Wentworth and including the Menindee Lakes.

Stephens Creek is a tributary of New Lake and Lake Tandou, part of the Menindee Lakes and would be part considered part of the EEC.

The waterways in the vicinity of the SCES facility are unnamed tributaries of Willa Willyong Creek a tributary of Stephens Creek Reservoir and are ephemeral waterways assessed as unlikely key fish habitat. Other unnamed waterways along the transmission line route are tributaries of Pine Creek which dissipates downstream of the Menindee Lakes. The waterways in the Project Area are ephemeral and unlikely key fish habitat and considered not part of the EEC.

4.0 Impact Assessment

4.1 Impacts of the Project

Potential impacts associated with the Project that could affect aquatic ecosystems include the following:

- Placement of material instream for waterway crossings along the transmission line access track. This will change stream morphology and there is low risk of blockage of fish passage. This would be limited to rare periods where semi-permanent habitat occurs in higher order streams where there are no instream structures downstream.
- Diversion of a section of the third order stream near the surface facility.
- Potential for increased downstream sediment load.
- Risk of spills and pollution associated with construction equipment working in and in the vicinity of the watercourse.
- Changes to water quality downstream environments.

The direct impact of the Project on riparian vegetation has been assessed in the main body of the BDAR in accordance with the BAM. Further assessment of the loss of riparian vegetation is therefore not required in this report.

4.2 Threatened Species, Populations and Communities

The FM Act provides for the conservation, protection and management of fisheries, aquatic systems and habitats in NSW. The FM Act establishes mechanisms for:

- the listing of threatened species, populations and ecological communities or key threatening processes
- the declaration of critical habitat
- consideration and assessment of threatened species impacts in the development assessment process (Division 12 of the FM Act).

No FM Act listed threatened aquatic flora or fauna species or TECs are known to occur within Project Area. Accordingly, no further assessment of the impact of the Project under Section 221ZV of the FM Act.

The EPBC Act listed Murray Cod (*Maccullochella peelli*) was identified but due to the highly ephemeral nature of the streams located within the Project Area, it is unlikely that this species will occur within the Project Area.

The Project is predicted to result in a negligible impact to flow in local creeks and negligible water quality impacts are predicted, with appropriate water management controls provided for each stage of the Project including erosion and sediment controls and appropriate storage of fuels/oils/chemicals with secondary containment to be provided. For the section of third order stream being diverted, appropriate erosion and sediment controls will be established and rehabilitation with native species to stabilise the diversion. Considering the context of the existing habitat and with consideration of the management measures to be implemented, there is negligible potential for the Project to result in significant impact on aquatic ecology and in particular threatened species habitat.

No additional threatened aquatic species, populations or EECs have potential to occur within the Project Area. The surface water impacts associated with the Project are not expected to result in an adverse impact on threatened species, endangered populations or ecological communities listed under the FM Act.

4.3 Avoidance, Minimisation and Mitigation Measures

4.3.1 Impact Avoidance and Minimisation Measures

A-CAES NSW identified early during Project design that impacts to the ecological values of aquatic ecosystems should be avoided where practicable. The transmission line component and poles within the Project Area will not impact waterways, and powerlines will 'straddle' waterways within the Project Area. However, several waterway crossings may be required along the transmission line and therefore have been included in the concept design.

As noted in the Section 6.8.1 of the EIS, waterway crossings will be designed with reference to the following documents in addition to DPEs *Guidelines for Controlled Activities on Waterfront Land*:

- *Why Do Fish Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull, S. and Witheridge, G., 2003)
- *Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management* (DPI, 2013).

Third order streams have been assessed as unlikely, minimal sensitivity key fish habitat due to the highly ephemeral nature of the waterways located within the Project Area. Minimum recommended crossing types for such waterways are either culverts, causeway or fords (Fairfull, S. and Witheridge, G2003, DPI 2013)

For works on waterfront land, the following measures will be incorporated into the design of the works and controls included in the Construction Environmental Management Plan (CEMP) for the Project:

- a site-specific erosion and sediment control plan will be prepared for all works on waterfront land
- where practicable, infrastructure will be maintained outside of the vegetated riparian zone
- utilise stream crossings for co-location of services to avoid the need to trench through stream beds wherever practicable
- rehabilitate disturbed areas and provide scour protection to bed and banks as required to mitigate any areas with increased potential for erosion due to changes in flow regimes associated with Project infrastructure
- where practicable, undertake works on waterfront land during periods of low rainfall erosivity from April to mid-October when construction timing restrictions are not recommended. Where not practicable, implement appropriate controls.

Other general mitigation measures proposed to be employed within the Project Area during the construction phase to minimise impacts to aquatic ecological values, include:

- All Project personnel will undertake an induction that will include environmental management requirements.
- The approved disturbance area will be clearly demarcated and identified during the construction. Environmental features to be retained within the construction footprint will be similarly demarcated and identified. Specific erosion and sediment control plans will be developed for each project component following completion of geotechnical studies. Erosion and sediment control plans will be prepared in accordance with relevant guidelines.
- Any large woody debris or boulders located within the construction footprint of waterways to be trenched are to be temporarily relocated during construction and returned to the waterways during reinstatement, at locations where scour risk can be avoided.

5.0 Conclusion

This aquatic ecological assessment for the Project has been prepared based on a combination of field investigations and a review of available aerial photographs, topographic maps, databases, literature, policies and guidelines. The Project crosses multiple first to third order streams and one third order stream will be diverted. While the waterways are between first and third order streams, they are characterised by highly ephemeral patterns of flow given the arid region in which the Project Area exists, and impacts exacerbated by cleared catchments and prevalence of mining and agricultural land uses. Waterways were classified in accordance with the Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013) and unnamed waterways within the Project Area have been classified as class 4 unlikely key fish habitat and Type 3 minimally sensitive key fish habitat. The waterways are unlikely to be important for fish passage.

One threatened species, Murray Cod listed under the EPBC Act is identified as occurring within 10 km of the Project Area. The waterways within the Project Area are ephemeral and have been classified as unlikely key fish habitat and the Murray Cod is not expected to occur in the Project Area.

The FM Act listed Aquatic Ecological Community in the Natural Drainage System of the Lowland Catchment of the Darling River EEC is described for waterways downstream of the Project Area encompassing tributaries of the Darling River. This would include Stephens Creek. The unnamed ephemeral waterways in the Project Area are tributaries of Willa Willyong Creek or Pine Creek and have been assessed as not being part of this aquatic ecological community.

The Project is not expected to result in adverse surface water impacts or in the downstream environments of the Project Area. Therefore, the Project is not expected to have an adverse effect on downstream surface water resources such that aquatic biodiversity would be adversely impacted. Overall, no aquatic biodiversity is anticipated to be materially adversely impacted by the Project.

6.0 References

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Department of Primary Industries (2023a). Key Fish Habitat Maps (Broken Hill LGA). Access via: https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/key-fish-habitat-maps. Accessed May 2023.

Department of Primary Industries (DPI) Fisheries (2023b). Fisheries Spatial Data Portal [online] available at: https://webmap.industry.nsw.gov.au/Html5Viewer/index.html?viewer=Fisheries_Data_Portal. Accessed May 2023.

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

APPENDIX E

Biodiversity Credit Report

BAM Credit Summary Report

Proposal Details

Assessment Id
00033989/BAAS17048/23/00041119

Proposal Name
Silver City Energy Storage Project - Transmission Line

BAM data last updated *
22/06/2023

Assessor Name
Ryan Parsons

Report Created
10/08/2023

BAM Data version *
61

Assessor Number
BAAS17048

BAM Case Status
Finalised

Date Finalised
10/08/2023

Assessment Revision
0

Assessment Type
Major Projects

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

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

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Bluebush shrubland on stony rises and downs in the arid and semi-arid zones												
9	155_VZ10_Good	Not a TEC	82	82.0	7.8	PCT Cleared - 50%	High Sensitivity to Gain			1.75		279

10	155_VZ9_ Disturbed	Not a TEC	38.7	38.7	0.87	PCT Cleared - 50%	High Sensitivity to Gain			1.75		15
											Subtotal	**294**
Bottlewasher - Copperburr grassland of the arid zone												
8	150_VZ8_ Good	Not a TEC	32.3	32.3	1	PCT Cleared - 5%	High Sensitivity to Gain			1.50		13
											Subtotal	**13**
Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion												
4	123_VZ5_ Good	Not a TEC	44.8	44.8	3.9	PCT Cleared - 17%	High Sensitivity to Gain			1.50		66
5	123_VZ4_ Dieback	Not a TEC	30.9	30.9	0.22	PCT Cleared - 17%	High Sensitivity to Gain			1.50		3
											Subtotal	**69**
Old Man Saltbush - mixed chenopod shrubland of the semi-arid hot (persistently dry) and arid climate zones (north-western NSW)												
11	158_VZ11_ Good	Not a TEC	55.4	55.4	0.38	PCT Cleared - 88%	High Sensitivity to Gain			2.00		11
											Subtotal	**11**

Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone												
6	136_VZ7_Good	Not a TEC	54.6	54.6	0.09	PCT Cleared - 20%	High Sensitivity to Gain			1.50		2
7	136_VZ6_Disturbed	Not a TEC	45.6	45.6	0.11	PCT Cleared - 20%	High Sensitivity to Gain			1.50		2
											Subtotal	**4**
River Red Gum open woodland wetland of intermittent watercourses mainly of the arid climate zone												
1	41_VZ2_High_Weed_Cover	Not a TEC	45.7	45.7	0.47	PCT Cleared - 13%	High Sensitivity to Gain			1.50		8
2	41_VZ3_Planted	Not a TEC	47.9	47.9	0.11	PCT Cleared - 13%	High Sensitivity to Gain			1.50		2
3	41_VZ1_Derived_Shrub	Not a TEC	51.8	51.8	0.05	PCT Cleared - 13%	High Sensitivity to Gain			1.50		1
											Subtotal	**11**
											Total	**402**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

BAM Credit Summary Report

Proposal Details

Assessment Id
00033989/BAAS17048/23/00041080

Proposal Name
Silver City Energy Storage Project - SCES Facility

BAM data last updated *
22/06/2023

Assessor Name
Ryan Parsons

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10/08/2023

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Assessor Number
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10/08/2023

Assessment Revision
0

Assessment Type
Major Projects

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

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

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

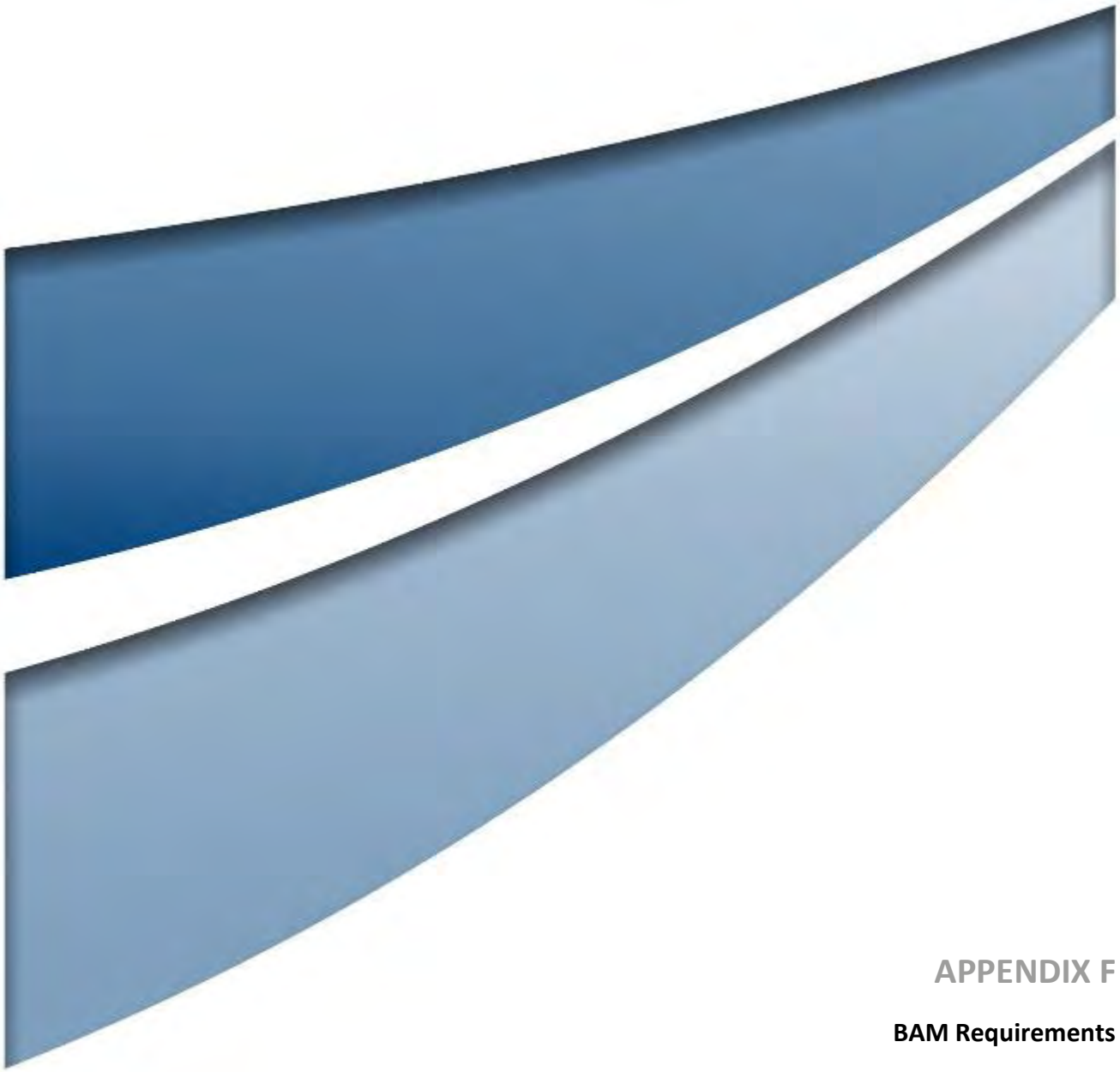
Bluebush shrubland on stony rises and downs in the arid and semi-arid zones											
3	155_VZ10_Good	Not a TEC	30.6	30.6	22.4	PCT Cleared - 50%	High Sensitivity to Gain			1.75		300
											Subtotal	**300**
Mulga - Dead Finish on stony hills mainly of the Channel Country Bioregion and Broken Hill Complex Bioregion											
1	123_VZ5_Good	Not a TEC	56.6	56.6	5.2	PCT Cleared - 17%	High Sensitivity to Gain			1.50		111
											Subtotal	**111**
Prickly Wattle open shrubland of drainage lines on stony rises and plains of the arid climate zone											
2	136_VZ7_Good	Not a TEC	54.9	54.9	3.4	PCT Cleared - 20%	High Sensitivity to Gain			1.50		71
											Subtotal	**71**
											Total	**482**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

Acacia notabilis / Mallee Golden Wattle (Flora)									
155_VZ10_Good	N/A	N/A	1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Not Listed	False	2
								Subtotal	**2**
Acacia rivalis / Creek Wattle (Flora)									
155_VZ10_Good	N/A	N/A	1	Geographic Distribution	Ability to colonise improved habitat	Endangered	Not Listed	True	3
								Subtotal	**3**
Indigofera longibractea / Showy Indigo (Flora)									
136_VZ7_Good	54.9	54.9	0.02	Geographic Distribution	Ability to colonise improved habitat	Endangered	Not Listed	True	1
155_VZ10_Good	30.6	30.6	0.2	Geographic Distribution	Ability to colonise improved habitat	Endangered	Not Listed	True	5
								Subtotal	**6**

Swainsona flavicarinata / Yellow-Keeled Swainsona (Flora)									
155_VZ10_Good	30.6	30.6	8.4	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Not Listed	True	193
								Subtotal	**193**
Swainsona murrayana / Slender Darling Pea (Flora)									
155_VZ10_Good	30.6	30.6	8.4	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	129
								Subtotal	**129**
Swainsona viridis / Creeping Darling Pea (Flora)									
123_VZ5_Good	56.6	56.6	2.1	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Not Listed	True	89
155_VZ10_Good	30.6	30.6	8.4	Geographic Distribution	Ecology or response to management is poorly known	Endangered	Not Listed	True	193
								Subtotal	**282**



APPENDIX F

BAM Requirements

Appendix F BAM Requirements

Report Section	BAM Reference	Requirement
• **Section 1** • **Figure 1.1** • **Figure 1.2**	Chapters 2 and 3	**INFORMATION** Introduction to the biodiversity assessment including: ☐ brief description of the proposal ☐ identification of subject land boundary, including: ☐ operational footprint (if BDAR) ☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR) ☐ land proposed for biodiversity certification (if BCAR) ☐ general description of the subject land ☐ sources of information used in the assessment, including reports and spatial data **MAPS and TABLES (in document)** ☐ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR)
• **Section 1** • **Section 3** • **Figure 1.3**	Sections 3.1. and 3.2, Appendix E	**INFORMATION** Identification of site context components and landscape features, including: ☐ general description of subject land topographic and hydrological setting, geology and soils ☐ percent native vegetation cover in the assessment area (as described in BAM Section 3.2) ☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3 ☐ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3 and Appendix E) ☐ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3 ☐ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3 ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3 and 3.1.3 ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3 ☐ any additional landscape features identified in any SEARs for the proposal

Report Section	BAM Reference	Requirement
		MAPS and TABLES (in document) ☐ Site Map ☐ Boundary of subject land ☐ Cadastre of subject land ☐ Landscape features identified in BAM Subsection 3.1.3 ☐ Location Map ☐ Digital aerial photography at 1:1,000 scale or finer ☐ Boundary of subject land ☐ Assessment area, (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development ☐ Landscape features identified in BAM Subsection 3.1.3 ☐ Additional detail (e.g. local government area boundaries) relevant at this scale Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location map include: ☐ IBRA bioregions and subregions ☐ rivers, streams and estuaries ☐ wetlands and important wetlands ☐ connectivity of different areas of habitat ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area ☐ any additional landscape features identified in any SEARs for the proposal ☐ NSW (Mitchell) landscape on which the subject land occurs
• **Section 4** • **Appendix A – Section (Methodology)** • **Figure 2.1** • **Figure 2.2** • **Figure 4.3**	Chapter 4, Appendix A and Appendix H	**INFORMATION** ☐ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1 and Subsection 4.1.1) ☐ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2) ☐ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1 and Subsection 4.1.1 ☐ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2

Report Section	BAM Reference	Requirement
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A) For each PCT within the subject land, describe: ☐ vegetation class ☐ extent (ha) within subject land ☐ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2) ☐ plant species relied upon for identification of the PCT and relative abundance of each species ☐ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2 (1 –2 .)) ☐ estimate of percent cleared value of PCT (BAM Subsection 4.2.1) Describe the vegetation integrity assessment of the subject land, including: ☐ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1) ☐ assessment of patch size (as described in BAM Subsection 4.3.2) ☐ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4 (1 –2.) ☐ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3) **MAPS and TABLES (in document)** ☐ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of cleared areas (as described in BAM Section 4.1 (1 –3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2) ☐ Map of PCTs within the subject land (as described in BAM Section 4.2) ☐ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1) ☐ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCTs boundaries ☐ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha) ☐ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2) Table of current vegetation integrity scores for each vegetation zone within the site and including: ☐ composition condition score ☐ structure condition score ☐ function condition score

Report Section	BAM Reference	Requirement
		☐ presence of hollow bearing trees
• **Section 5.0** • **Figure 2.2** • **Figure 5.1** • **Appendix A – Section 1.3**	Chapter 5	**INFORMATION** Identify ecosystem credit species likely to occur on the subject land, including: ☐ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2) ☐ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2) ☐ justification for addition of any ecosystem credit species to the list Identify species credit species likely to occur on the subject land, including: ☐ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1) ☐ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2) ☐ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2) ☐ justification for addition of any species credit species to the list From the list of candidate species credit species, identify: ☐ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4 (2.a .)) ☐ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4 (2.d .)) ☐ species for which targeted surveys are to be completed to determine species presence (Subsection 5.2.4 (2.b .)) ☐ species for which an expert report is to be used to determine species presence (Subsection 5.2.4 (2.c .)) Present the outcomes of species credit species assessments from: ☐ threatened species survey (as described in BAM Section 5.2.4) ☐ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Section 5.2.4 and 5.3 , Box 3) Where survey has been undertaken include detailed information on: ☐ survey method and effort, (as described in BAM Section 5.3) ☐ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the Department's taxa-specific survey guides or where no relevant guideline has been published ☐ timing of survey in relation to requirements in the TBDC or the Department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys

Report Section	BAM Reference	Requirement
		☐ survey personnel and relevant experience ☐ describe any limitations to surveys and how these were addressed/overcome **MAPS and TABLES (in document)** ☐ Table showing ecosystem credit species in accordance with BAM Section 5.1.1 , and identifying: ☐ the ecosystem credit species removed from the list ☐ the sensitivity to gain class of each species ☐ Table detailing species credit species in accordance with BAM section 5.2 and identifying: ☐ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or micro habitat features are not present ☐ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map ☐ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4) ☐ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)
• **Section 6.0**	Chapter 6	**INFORMATION** Identify potential prescribed biodiversity impacts on threatened entities, including: ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☐ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2 ☐ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☐ water bodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4) ☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5) ☐ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6) ☐ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts ☐ Describe the importance of habitat features to the species including, where relevant, impacts on life-cycle or movement patterns (e.g. Subsection 6.1.3)

Report Section	BAM Reference	Requirement
		MAPS and TABLES (in document) ☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.) ☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)
• **Section 7.0** • **Figure 7.1**	Chapter 7	**INFORMATION** Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative: ☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology ☐ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route ☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location ☐ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site ☐ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2) ☐ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Section 7.2.1(3 .)) **MAPS and TABLES (in document)** ☐ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility ☐ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation ☐ Maps demonstrating indirect impact zones where applicable
• **Section 8.0** • **Figure 10.1**	Chapter 8, Sections 8.1 and 8.2	**INFORMATION** ☐ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1) Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):

Report Section	BAM Reference	Requirement
		☐ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal ☐ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications ☐ reporting any limitations or assumptions, etc. made during the assessment ☐ identification of the threatened entities and their habitat likely to be affected Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including: assessment of the nature, extent and duration of impacts on the habitat of threatened species or ecological communities associated with: ☐ karst, caves, crevices, cliffs, rocks and other features of geological significance ☐ human-made structures ☐ non-native vegetation ☐ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range ☐ movement of threatened species that maintains their life cycle ☐ water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities ☐ assessment of the impacts of wind turbine strikes on protected animals ☐ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC **MAPS and TABLES (in document)** ☐ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts
• **Section 8.4**	Chapter 8, Sections 8.4 and 8.5	**INFORMATION** Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including: ☐ techniques, timing, frequency and responsibility ☐ identify measures for which there is risk of failure ☐ evaluate the risk and consequence of any residual impacts ☐ document any adaptive management strategy proposed Identification of measures for mitigating impacts related to: ☐ displacement of resident fauna (as described in BAM Subsection 8.4.1 (2 .)) ☐ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1 (3 .))

Report Section	BAM Reference	Requirement
		☐ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2) ☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5) **MAPS and TABLES (in document)** ☐ Table of measures to be implemented to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility
• **Section 9**	Chapter 9	**INFORMATION** Identification and assessment of impacts on TECs and threatened species that are at risk of serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including: ☐ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land ☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land ☐ documenting assumptions made and/or limitations to information ☐ documenting all sources of data, information, references used or consulted ☐ clearly justifying why any criteria could not be addressed ☐ Identification of impacts requiring offset in accordance with BAM Section 9.2 ☐ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1 (3 .) ☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3 **MAPS and TABLES (in document)** ☐ Map showing the extent of TECs at risk of an SAII within the subject land ☐ Map showing location of threatened species at risk of an SAII within the subject land Map showing location of: ☐ impacts requiring offset ☐ impacts not requiring offset ☐ areas not requiring assessment
• **Section 10.0**	Chapter 10	**INFORMATION** Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including: ☐ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H)

Report Section	BAM Reference	Requirement
		☐ change in vegetation integrity score (BAM Subsection 8.1.1) ☐ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 9) ☐ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3) **MAPS and TABLES (in document)** ☐ Table of PCTs requiring offset and the number of ecosystem credits required ☐ Table of threatened species requiring offset and the number of species credits required
• **Section 11.0**	Chapter 10	**INFORMATION** ☐ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2) **MAPS and TABLES (in document)** ☐ Table of credit class and matching credit profile

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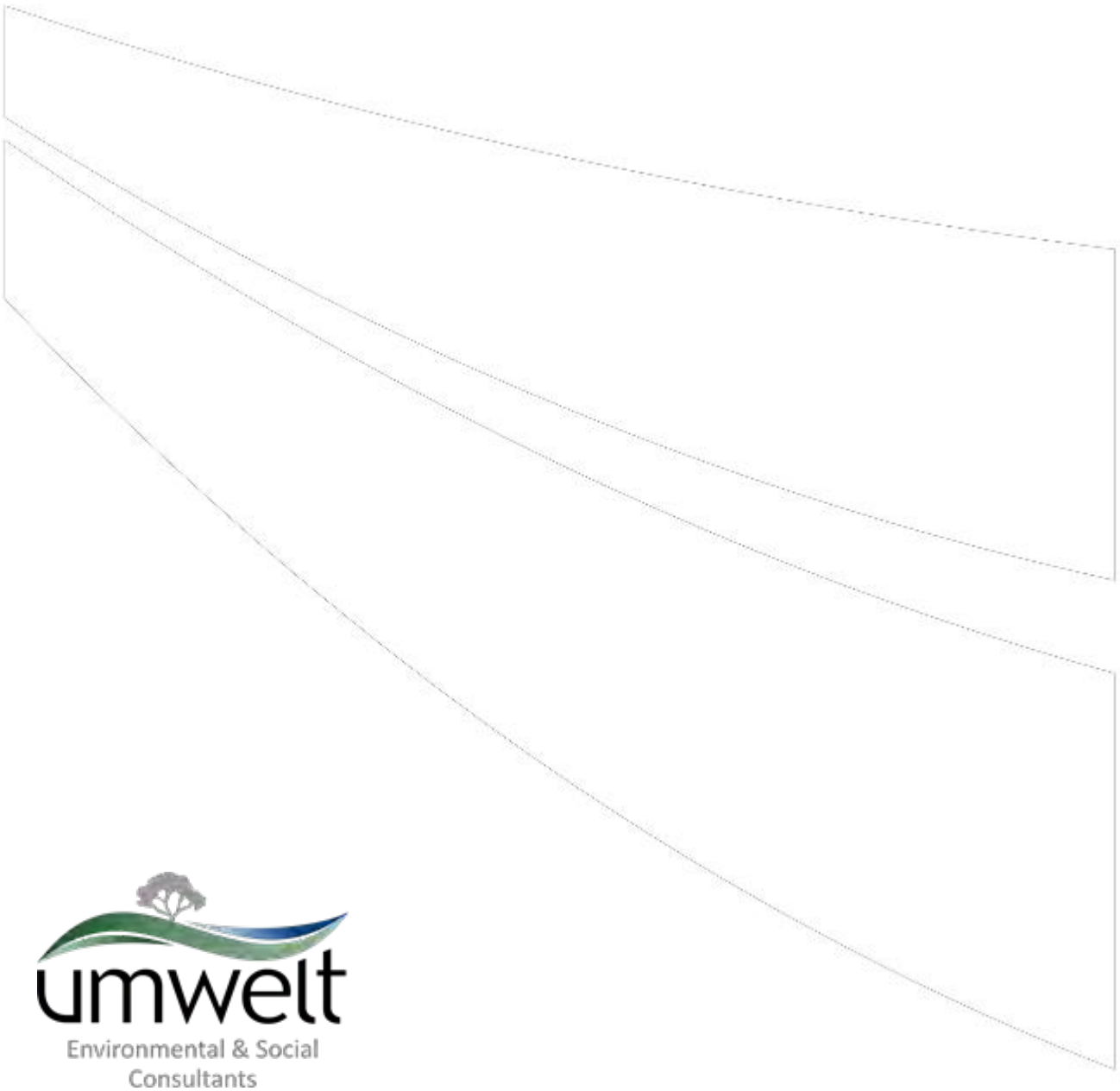

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