

# Goyder South Hybrid Renewable Energy Facility – Stage 1A

## Native Vegetation Clearance Data Report

Clearance under the *Native Vegetation Regulations 2017*

24 September 2021

Prepared by Jesse Carpenter – EBS Ecology (NVC Accredited Consultant)



# Goyder South Hybrid Renewable Energy Facility – Stage 1A: Native Vegetation Clearance Data Report

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# Glossary and abbreviations

<b>BAM</b>	Bushland Assessment Method
<b>BDBSA</b>	Biological Database of South Australia (maintained by DEW)
<b>DAWE</b>	Department of Agriculture, Water and the Environment (Commonwealth)
<b>DEW</b>	Department for Environment and Water (South Australia)
<b>EBS</b>	Environment and Biodiversity Services Pty Ltd (trading as EBS Ecology)
<b>EPBC Act</b>	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
<b>GWF 1 Stage 1A</b>	Goyder Wind Farm 1 Pty Ltd Stage 1A
<b>GWF 1 Stage 1B</b>	Goyder Wind Farm 1 Pty Ltd Stage 1B
<b>ha</b>	Hectare(s)
<b>IBRA</b>	Interim Biogeographical Regionalisation of Australia
<b>INTG</b>	Iron-grass Natural Temperate Grassland Threatened Ecological Community
<b>km</b>	Kilometre(s)
<b>kV</b>	Kilovolt/s
<b>m</b>	Metre/s
<b>mm</b>	Millimetre/s
<b>NatureMaps</b>	Initiative of DEW that provides a common access point to maps and geographic information about South Australia's natural resources in an interactive online mapping format
<b>NPW Act</b>	<i>National Parks and Wildlife Act 1972</i>
<b>NV Act</b>	<i>Native Vegetation Act 1991</i>
<b>NVC</b>	Native Vegetation Council
<b>PBTL</b>	Pygmy Bluetongue Lizard ( <i>Tiliqua adelaidensis</i> )
<b>PMST</b>	Protected Matters Search Tool (under the EPBC Act; maintained by DAWE)
<b>RAM</b>	Rangelands Assessment Method
<b>SA</b>	South Australia(n)
<b>Search Area</b>	5 km buffer of the Project Area considered in the desktop assessment database searches
<b>SEB</b>	Significant Environmental Benefit
<b>sp.</b>	Species
<b>spp.</b>	Species (plural)
<b>ssp.</b>	Sub-species

<b>STAM</b>	Scattered Tree Assessment Method
<b>TEC</b>	Threatened Ecological Community
<b>VA</b>	Vegetation Association/s
<b>var.</b>	Variety (a taxonomic rank below that of species and subspecies, but above that of form)
<b>WTG</b>	Wind Turbine Generator

# Table of Contents

<b>1. Application information</b>	<b>8</b>
<b>2. Purpose of clearance</b>	<b>11</b>
2.1. Description	11
2.2. Background	11
2.2.1. Overview of Goyder South Hybrid Renewable Energy Facility	11
2.2.2. Staging of the Goyder South Project	13
2.2.3. Native Vegetation Clearance Application Context	13
2.2.4. Landscape context	13
2.2.5. Previous ecological studies	15
2.3. General location map	16
2.4. Details of the proposal	18
2.5. Approvals required or obtained	19
2.6. Native Vegetation Regulation	20
2.7. Development Application information	20
<b>3. Method</b>	<b>21</b>
3.1. Flora assessment	21
3.1.1. Bushland Assessment Method	21
3.2. Fauna assessment	21
3.2.1. PMST report	21
3.2.2. BDBSA data extract	21
3.2.3. Field survey	22
3.2.4. Likelihood of occurrence	23
<b>4. Assessment outcomes</b>	<b>24</b>
4.1. Vegetation assessment	24
4.1.1. General description of the vegetation, the site and matters of significance	24
4.1.2. Details of the vegetation associates/scattered trees proposed to be impacted	28
4.1.3. Site map showing areas of proposed impact	39
4.1.4. Photo log	40
4.2. Threatened species assessment	41
4.2.1. Threatened fauna	41
4.2.2. Threatened flora	46

4.3. Cumulative impacts .....	52
4.4. Addressing the Mitigation Hierarchy.....	53
4.5. Principles of Clearance (Schedule 1, <i>Native Vegetation Act 1991</i> ) .....	55
4.6. Risk assessment .....	61
<b>5. Clearance summary .....</b>	<b>62</b>
<b>6. Significant Environmental Benefit .....</b>	<b>66</b>
<b>7. References .....</b>	<b>68</b>
<b>8. Appendices .....</b>	<b>70</b>
Appendix 1. IBRA Bioregions, Subregions and Environmental Associations of the Project Area .....	71
Appendix 2. Flora species recorded in the Project Area during this and previous field surveys.....	73
Appendix 3. Likelihood of occurrence of threatened species .....	78
Threatened Fauna .....	78
Threatened Flora .....	99
Appendix 4. Fauna species recorded in the Project Area during this and previous field surveys.....	117
Appendix 5. Bushland Assessment Scoresheets associated with the proposed clearance. ....	120

## List of Tables

Table 1. Application details. ....	8
Table 2. Summary of the proposed clearance. ....	8
Table 3. Stages of the Goyder South Project.....	13
Table 4. Previous ecological studies of the Goyder Project Area.....	15
Table 5. Project Area attributes.....	16
Table 6. Survey methods used for targeted fauna surveys in the Project Area.....	23
Table 7. Criteria for the likelihood of occurrence of threatened species within the Project Area .....	23
Table 8. Protected areas near the Goyder South Project Areas.....	24
Table 9. Plants Declared as weeds under the <i>Landscape South Australia Act 2019</i> recorded during the survey.....	25
Table 10. Vegetation Associations (VA) mapped in the Project Area. The table indicates the total extent of each VA and the extent expected to be impacted by the Goyder South project. ....	26
Table 11. Summary of VA2. ....	29
Table 12. Summary of VA6. ....	30
Table 13. Summary of VA8. ....	32
Table 14. Summary of VA10. ....	36
Table 15. Summary of VA24. ....	38
Table 16. Likelihood of occurrence of threatened fauna identified in the desktop assessment. The data source and threat levels are described in the table footer. ....	43

Table 17. Threatened plant species recorded in the Project Area during the current and past surveys. ....	46
Table 18. Likelihood of occurrence of threatened flora identified in the desktop assessment. The data source and threat levels are described in the table footer. ....	48
Table 19. Cumulative Clearance Summary for the Goyder South Project. ....	52
Table 20. Assessment against the Principles of Clearance. ....	55
Table 21. Summary of the level of risk associated with the application. ....	61
Table 22. Clearance summary table. ....	63
Table 23. Totals summary table. ....	65

## Table of Figures

Figure 1. Mean monthly rainfall and maximum and minimum temperatures recorded at Eudunda Weather Station from 1965 to 2021. The graph also shows actual monthly rainfall from September 2020 to August 2021 (Bureau of Meteorology, 2021). ....	14
Figure 2. General location map of GWF 1 Stage 1A, showing IBRA Association boundaries and watercourses. ....	17
Figure 3. Vegetation Associations of the GWF 1 Stage 1A Project Area. The impact footprint is also shown. ....	27
Figure 4. Tussock grassland dominated by <i>Austrostipa</i> spp. ....	40
Figure 5. Tussock grassland dominated by <i>Lomandra</i> spp. ....	40
Figure 6. <i>Eucalyptus leucoxylon</i> ssp. <i>pruinosa</i> Open Woodland over exotic and native grasses in the north-eastern corner of the Project Area. ....	40
Figure 7. <i>Allocasuarina verticillata</i> Open Woodland with a grassy understorey and sparse shrubs in the far south of the Project Area. ....	40
Figure 8. Heavily grazed <i>Dodonaea viscosa</i> . This is typical of the level of grazing impact to palatable shrubs in heavily grazed parts of the Project Area. ....	40
Figure 9. Shrubs, such as these <i>Correa glabra</i> var. <i>turnbullii</i> , were present in grassland associations were protected from grazing. ....	40
Figure 10. Records of EPBC Act listed threatened species and Wedge-tailed Eagle nests collected by EBS Ecology. Areas of potentially suitable Pygmy Bluetongue Lizard (PBTL) habitat are also shown. ....	42
Figure 11. Proposed On-ground SEB Area north of Hopkins Creek Conservation Park (white polygon). ....	67

# 1. Application information

Table 1. Application details.

<b>Applicant:</b>	NEOEN		
<b>Key contact:</b>	Tom Jenkins Project Manager NEOEN Level 6, 16 Marcus Clarke Street Canberra ACT 2601 email: tom.jenkins@neoen.com		
<b>Landowner:</b>	Various private owners – refer to Appendix C within Attachment 4 (Att 3 DA Package Appendix Vol 1).		
<b>Site Address:</b>	Approximately 10km south of Burra, across the suburbs of Burra, Hanson, Porter Lagoon, Koonoona and Apoinga.		
<b>Local Government Area:</b>	Regional Council of Goyder	<b>Hundred:</b>	Kooringa Apoinga Baldina Bright
<b>Title ID:</b>	Refer to Appendix C within Attachment 4 (Att 3 DA Package Appendix Vol 1)	<b>Parcel ID</b>	Refer to Appendix C within Attachment 4 (Att 3 DA Package Appendix Vol 1)

Table 2. Summary of the proposed clearance.

<b>Purpose of clearance:</b>	<p>Clearance of native vegetation is proposed to allow for the construction and operation of 38 wind turbine generators (WTGs) and associated infrastructure for Goyder Wind Farm 1 Pty Ltd Stage 1A (referred to as GWF 1 Stage 1A). Associated infrastructure includes access tracks and underground cables as well as a temporary construction compound.</p> <p>GWF 1 Stage 1A is part of the larger Goyder South Hybrid Renewable Energy Facility (referred to as the Goyder South Project or Goyder South). Please refer to Section 2.2.1 for more information on the Goyder South Project and the staged approach associated with the Project.</p>
<b>Native Vegetation Regulation:</b>	Regulation 12, Schedule 1; clause 34 Infrastructure
<b>Description of the vegetation under application:</b>	<p><b><u>Lomandra multiflora ssp. dura / Lomandra effusa Mixed Open Grassland</u></b> A total of 11.06 hectares (ha) are included in the application. The vegetation is in poor condition, impacted by weeds and grazing, with low plant species diversity. Qualifies as, or adjoins areas that qualify as, EPBC Act listed <i>Iron-grass Natural Temperate Grasslands of South Australia</i> Endangered Ecological Community. Known habitat for EPBC Act Endangered Pygmy Bluetongue Lizard.</p> <p><b><u>Eucalyptus leucoxylon ssp. pruinosa Open Woodland</u></b> A total of 4.69ha are included in the application. The woodland is an isolated patch in poor condition with a mid and understorey heavily impacted by grazing and weed infestations, with exotic grasses dominant in the understorey. The upper storey contains trees of value to the landscape, with old-growth and hollows present.</p>



	<p><b><u>Austrostipa spp. Mixed Open Grassland</u></b></p> <p>The most extensive Vegetation Association, with a total of 115.90ha included in this application. Grasslands are generally in poor condition, with some patches of moderate condition vegetation. Native plant species diversity is low, although higher in areas of better condition. Impacted throughout by high grazing pressure and weed cover. Known habitat for EPBC Act Endangered Pygmy Bluetongue Lizard.</p> <p><b><u>Callitris gracilis Low Open Woodland</u></b></p> <p>A total of 1.52ha are included in the application. The Vegetation Association occurs as a small, isolated patch in moderate condition with a higher native plant diversity than most other associations in the GWF 1 Stage 1A. Two NPW Act threatened plant species were recorded within it.</p> <p>Grazing impact remains high, with high weed cover limited to the edges of the patch.</p> <p><b><u>Allocasuarina verticillata Open Woodland over Bursaria spinosa ssp. spinosa and Austrostipa spp.</u></b></p> <p>A total of 0.22ha are included in the application. Small, isolated patch confined to rocky, high upper slopes. The association has the highest native plant diversity of the associations under application. Grazing impact remains high, with palatable shrubs generally in an over-utilised state.</p>
<b>Total proposed clearance – area (ha) and/or number of trees:</b>	2210.47ha is proposed to be cleared for GWF 1 Stage 1A.
<b>Level of clearance:</b>	Level 4
<b>Overlay (Planning and Design Code):</b>	Native Vegetation Overlay
<b>Map of proposed clearance area:</b>	Refer to Section 4.1.3 Map of proposed clearance area.
<b>Mitigation Hierarchy:</b>	<p>NEOEN have completed ecological assessment of the GWF 1 Stage 1A Project Area (as part of assessment for the broader Goyder South Project) to identify and understand potential impacts to flora and fauna (as outlined in Section 2.2.5).</p> <p>The findings and recommendations of the investigations and assessments have informed the design, siting and layout of infrastructure associated with the Goyder South Project, to ensure that impacts to flora and fauna are initially avoided where possible and if not avoidable, minimised as much as possible.</p> <p>As a result, NEOEN has reduced the maximum number of proposed wind turbines substantially from over 200 turbines to about 157 (across the whole Goyder South Project), implemented evidence-based buffers and setbacks and relocated other infrastructure to avoid impacts.</p> <p>As part of flora and fauna assessment for the Goyder South Project, ecological constraints including, but not limited to, Wedge-tailed Eagle and Peregrine Falcon nests (active and in-active), Peppermint Box (<i>Eucalyptus odorata</i>) Closed Woodland (potential EPBC Act Threatened Ecological Community), Lomandra grassland and potential Iron-grass Natural Temperate Grassland of South Australia TEC, Pygmy Blue-tongue Lizards (PBTLs) and PBTL habitat, and other threatened flora species such as <i>Dodonaea subglandulifera</i>, <i>Acacia spilleriana</i>, <i>Dodonaea procumbens</i> and <i>Olearia pannosa ssp. pannosa</i> were identified by EBS Ecology (2020) to assist NEOEN to avoid and/or minimise impacts to these ecological constraints as much as possible.</p> <p>To avoid and protect a particular area containing Wedge-tailed Eagle and Peregrine Falcon nests (active and in-active) and Peppermint Box (<i>Eucalyptus odorata</i>) Closed Woodland (potential TEC), as well as some individual PBTLs and PBTL habitat, NEOEN delineated an Ecological Protection Zone (EPZ)</p>

	<p>within the Goyder South Project Area, with the intention of limiting infrastructure within the EPZ. However, following further investigations, NEOEN adjusted the Project Area boundary to exclude majority of the EPZ from the Project Area, despite the EPZ incorporating a large part of the pre-existing and pre-approved Stony Gap Project. With the exclusion of the EPZ, NEOEN have removed approximately 18 wind turbines from the original number of turbines proposed in January 2019 and the overall footprint of the Project, together with the Project Area boundary, has changed (to avoid and minimise impacts to ecology). It is EBS Ecology's opinion that NEOEN have taken particular consideration of the Mitigation Hierarchy.</p> <p>NEOEN have undertaken a number of actions to avoid and minimise impacts on native vegetation including:</p> <ul style="list-style-type: none"> <li>• The site planning for the Goyder South Project covers an extensive area, which has enabled NEOEN to locate most of the infrastructure on cleared farming land (either grazed or cropped);</li> <li>• NEOEN have withdrawn all infrastructure from a sensitive area (the EPZ) in the north-western part of the project area that was previously approved (Development Approval) as part of the Stony Gap wind farm;</li> <li>• NEOEN has sought and obtained approval for micro siting of up to 200m to enable site sensitive responses for infrastructure that does not have locational flexibility (e.g., wind turbines).</li> </ul> <p>NEOEN also propose to work closely with the contractors to minimise the extent of clearance at the micro level.</p> <p>A Construction Environmental Management Plan (CEMP) will be implemented to avoid/minimise/mitigate impact to flora and fauna during construction. Please refer to Section 4.4 for more detail.</p>
<b>SEB Offset proposal</b>	<p>On-ground Please refer to Section 6 for more detail.</p>

# 2. Purpose of clearance

## 2.1. Description

Clearance of native vegetation is required to develop *Goyder Wind Farm 1 Pty Ltd Stage 1A* (referred to as **GWF 1 Stage 1A**), which is part of the proposed Goyder South Hybrid Renewable Energy Facility (referred to as the Goyder South Project).

**GWF 1 Stage 1A** will consist of 38 Wind Turbine Generators (WTGs) and associated infrastructure including access tracks and underground cables, as well as a temporary construction compound. Further detail regarding Goyder South specifications and extent of the expected impact footprint is discussed in Section 2.4.

## 2.2. Background

### 2.2.1. Overview of Goyder South Hybrid Renewable Energy Facility

NEOEN Australia is proposing to construct the Goyder South Hybrid Renewable Energy Facility (the Goyder South Project) which is located between Burra and Robertstown.

The Goyder South Project combines wind, solar and energy storage in one integrated project. The facility will be capable of delivering a steady, reliable, dispatchable output of power throughout the day and night.

The Goyder South Project will generate more than 4,800,000 MWh of power annually and is comprised of:

- A wind farm of up to 163 turbines with a capacity of up to 1200MW, a maximum hub height of 160m, a maximum blade length of 80m and an overall maximum height (tip height) of 240m;
- A solar farm (across two sites) of up to 3000 ha of solar panels with a capacity of up to 600MW;
- An energy storage facility (lithium-ion battery) with a capacity of up to 900MW/1,800MWh (2 hours);
- Associated infrastructure for connection to the electricity grid including three substations, access tracks, underground connection cabling and overhead transmission lines;
- Permanent operations and maintenance compounds;
- Temporary construction compounds for both wind and solar components, including concrete batching plants; and
- A number of meteorological masts (in addition to those already on the site) to record wind speed and other meteorological data, both pre- and post- construction.

The Project Area for Goyder South begins approximately 5 km south of the centre of Burra and extends approximately 27 km south before terminating approximately 5 km north of Robertstown. It spans the Worlds End Valley with turbines located on the western and eastern ridge lines extending between Burra and Robertstown. The northern solar site is proposed in the centre of the Worlds End valley, on the western side of the Worlds End Highway, while the southern solar site would be located further south to the east of the eastern ridgeline in the locality of Bright. Both sites are cleared, previously cropped sites which avoids further native vegetation clearance.

Land within the Project Area is generally privately owned and comprises predominantly dryland cropping and some limited grazing. Prior to European settlement, the Ngadjuri people occupied the land.

The region has a relatively low population density and most residential premises are located in a number of towns, with Burra being the largest and a key regional service centre.

The Goyder South Project Area covers a total area of approximately 30,000 ha and has a total asset footprint of approximately 3,300 ha which represents slightly more than 10% of the total area. The wind turbines are dispersed over an area of approximately 28,000 ha but the footprint is approximately 0.1% of this. The two solar farms are located on sites of 1,342 ha (Bright) and 2097 ha (Worlds End) although the developable area (avoiding vegetation and drainage lines) is 996 ha and 1925 ha respectively.

The location of Goyder South has been selected on the basis of a number of critical factors:

- Clearly established, excellent wind and solar resources
- Suitable topography for both wind (elevation) and solar (flat, minimal flood risk)
- Appropriate existing land uses (marginal agricultural viability, supporting mixed land use)
- Proximity to the national electricity grid infrastructure (Robertstown substation) and the proposed EnergyConnect interconnector with NSW
- Strong support from landowners, neighbours and Council
- Accessibility for construction and on-going maintenance
- Large project scale and low density of dwellings enable generous setbacks from dwellings and sensitive ecological areas.

The Burra/Robertstown region is typical of the dryer areas of the mid north region which can experience cool to cold winters and warm to hot summers. This area is on the edge of Goyder's Line and has experienced drought conditions for the last three years. An increasing challenge for the region will be the potential impact of climate change on rainfall patterns and temperatures. Trends associated with climate change could have significant impacts on the viability of current agricultural activities.

Based on NEOEN's discussions with landholders and Council, a greater proportion of the land in and around the project, which was once used for cropping, is already transitioning to grazing, especially in the World's End valley, which has been accelerated by the drought conditions in recent years. A report prepared by the Climate Council in 2016 identified that a key barrier to adaptation is a 'lack of financial resources (that) is preventing many landholders from preparing for climate change'. This report identified renewable energy projects as one opportunity to provide an alternative source of income for landholders and to support economic growth.

In the longer term, landowners in this already marginal area may struggle with increasingly frequent and severe periods of drought. Given this, some may find the diversified and secure income associated with the Goyder South Project helpful in working towards drought resilience, and NEOEN's discussions with landowners have indicated that this has been one of their main motivations in deciding to participate in the project.

### 2.2.2. Staging of the Goyder South Project

As the Goyder South Project will total up to \$3 billion in investment, NEOEN proposes to implement the Project in stages, with each stage having its own legal entity, construction contracts and financing packages. An overview of each stage is outlined in Table 3.

**Table 3. Stages of the Goyder South Project.**

Stage	Main infrastructure	Legal entity
GWF 1 Stage 1A	38 WTGs; access tracks; cables	Goyder Wind Farm 1A Pty Ltd
GWF 1 Stage 1B	37 WTGs; access tracks; cables	Goyder Wind Farm 1B Pty Ltd
Overhead Transmission Line and Substation West	Approximately 34 km of overhead transmission line and a substation to which both GWF 1 Stage 1A and GWF 1 Stage 1B will connect.	Goyder Wind Farm Common Asset Pty Ltd
Battery	Lithium-ion battery facility (900MW/1800MWh – 2 hours)	NEOEN Australia Pty Ltd

As such, NEOEN is seeking consideration of native vegetation impacts for each stage of the Goyder South Project separately.

### 2.2.3. Native Vegetation Clearance Application Context

This Native Vegetation Clearance Application is for **GWF 1 Stage 1A**. Separate Native Vegetation Clearance Applications will be submitted for two other stages of the Goyder South Project, as follows:

- GWF 1 Stage 1B
- Overhead Transmission Line and Substation

The 'Battery' stage does not require a Native Vegetation Clearance Application as the battery facility is proposed to be located within cropped land and will not impact upon any native vegetation.

### 2.2.4. Landscape context

#### **Interim Biogeographical Regionalisation of Australia**

The Interim Biogeographical Regionalisation of Australia (IBRA) is a landscape-based approach to classifying the land surface across a range of environmental attributes, which is used to assess and plan for the protection of biodiversity. Under the IBRA, the landscapes of South Australia (SA) are classified according to Bioregion, Subregion and Environmental Association.

The Project Area falls within the Flinders Lofty Block Bioregion, Broughton Subregion and the Burra Hills and Hansen Environmental Associations (Figure 2). The typical landform, soil, geology and vegetation of each of these associations are summarised in Appendix 1.

#### **Climate**

Climate data was sourced from the Eudunda Weather Station (site number: 024511), located approximately 40 km south of the southern boundary of the Project Area and the closest weather recording station. The Project Area

experiences relatively hot maximum temperatures in summer, with mean maximum temperatures highest in January (29.4 degrees) and February (29.1 degrees). The wettest months are August (55.6 millimetres (mm)), June (51.8mm) and July (51.2mm) (Bureau of Meteorology, 2021).

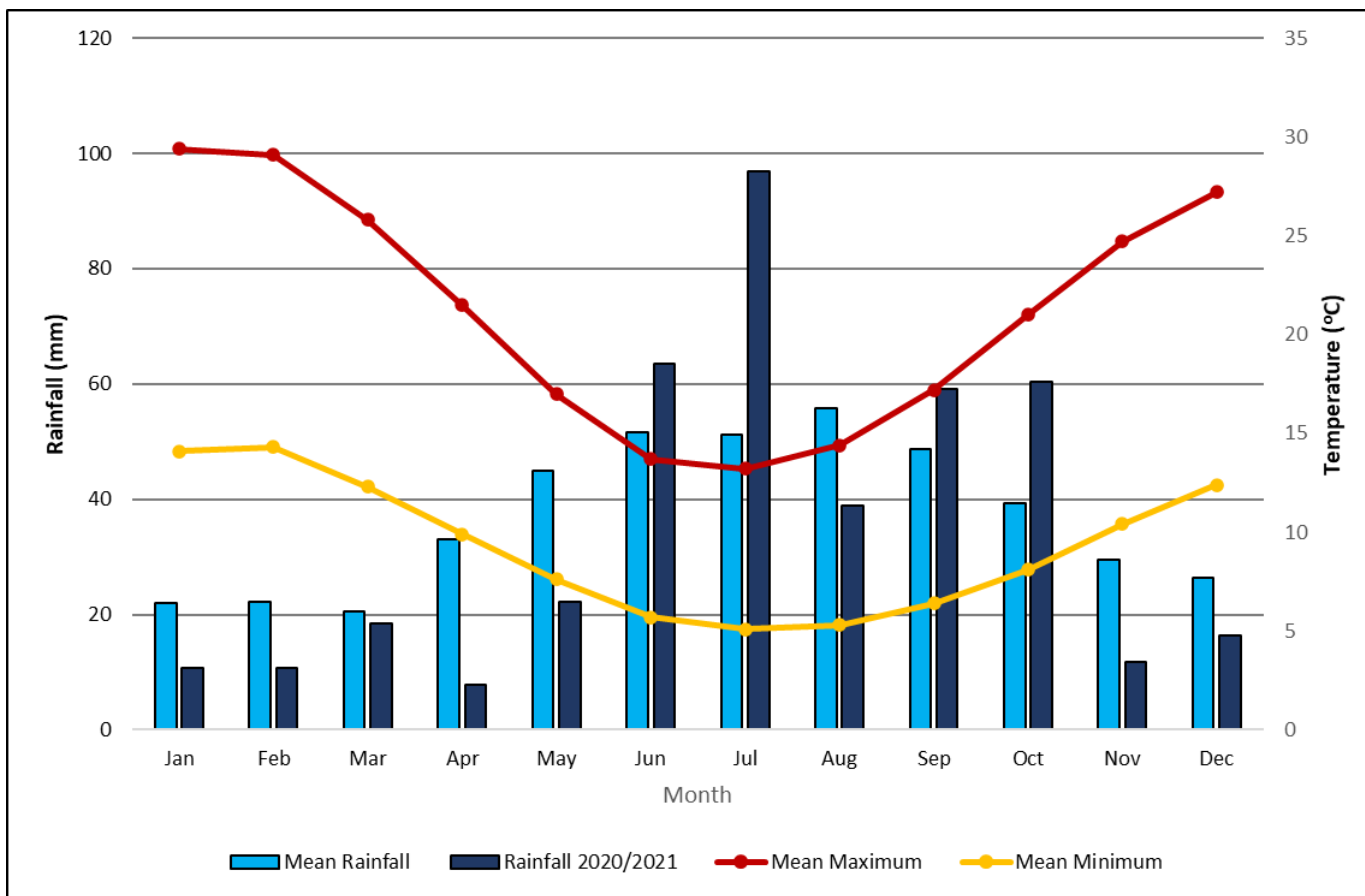


Figure 1. Mean monthly rainfall and maximum and minimum temperatures recorded at Eudunda Weather Station from 1965 to 2021. The graph also shows actual monthly rainfall from September 2020 to August 2021 (Bureau of Meteorology, 2021).

### Watercourses and Wetlands

One named watercourse occurs in the Project Area: Stony Creek flows from the north-west to south-east. Stony Creek typically flows only after winter and spring rains, although it contains numerous semi-permanent waterholes, with remnant riparian vegetation, mainly scattered *Eucalyptus camaldulensis*, *Typha domingensis* and *Phragmites australis*, in places. Minor unnamed tributaries of Stony Creek occur throughout the Project Area. All are ephemeral and generally do not contain riparian or aquatic vegetation (Figure 2).

There are no wetlands in the Project Area. The closest is Porter Lagoon, an ephemeral salt lake located approximately 5km to the south.

### Current Landuse

The Project Area is situated in an agricultural landscape, with land used for dryland agriculture, including cropping and grazing. Cropping areas contain little or no native vegetation. Land not used for cropping contains a mixture of

exotic and native pasture and remnant grassy woodland communities. These areas are currently used for cattle and sheep grazing.

### 2.2.5. Previous ecological studies

EBS Ecology has undertaken previous ecological studies of the Project Area on behalf of NEOEN and other parties since a wind farm was first proposed for the area in 2008. This includes both baseline flora and fauna studies and targeted surveys for threatened species, as listed in Table 4. This Clearance Data Report in part draws on the findings of these studies to compliment the results of field work conducted in August 2021.

Reports documenting studies undertaken since 2019 are provided as Attachments 1, 2, and 3 as detailed below:

- Attachment 1: *Goyder Hybrid Renewable Energy Facility: Flora and Fauna Assessment*
- Attachment 2: *Goyder - Pygmy Blue-tongue Lizard Survey March 2021.*
- Attachment 3: *Goyder South Hybrid Renewable Energy Facility: Flora and Fauna Assessment Addendum.*

Older reports listed can be provided on request.

**Table 4. Previous ecological studies of the Goyder Project Area.**

Study	Year	Objectives	Reference
Baseline flora and fauna assessment.	2008	<ul style="list-style-type: none"> <li>• Undertake a baseline survey of the Stony Gap Wind Farm Project (now Goyder Stage 1A and parts of Stage 1B)</li> </ul>	EBS Ecology. (2008a). <b>Stony Gap Wind Farm Flora Survey and Fauna Habitat Assessment.</b> Adelaide: Report to Hydro Tasmania by EBS Ecology.
Targeted flora and fauna survey.	2008	<ul style="list-style-type: none"> <li>• Undertake a flora survey targeted to proposed areas of impact.</li> <li>• Undertake targeted survey for Pygmy Blue-tongue Lizard and Flinders Ranges Worm Lizard.</li> <li>• Undertake a bat acoustic survey.</li> </ul>	EBS Ecology. (2008b). <b>Additional Stony Gap Wind Farm Flora and Fauna Survey November 2008.</b> Adelaide: Report to Hydro Tasmania by EBS Ecology.
Targeted flora and fauna survey and vegetation mapping.	2011	<ul style="list-style-type: none"> <li>• Undertake a flora survey targeted to proposed areas of impact.</li> <li>• Survey for raptor nests.</li> <li>• Map areas of suitable habitat for threatened species.</li> </ul>	EBS Ecology. (2011). <b>Stony Gap Wind Farm – Additional Flora and Fauna Assessment November and December 2010.</b> Adelaide: Unpublished report to Hydro Tasmania by EBS Ecology.
Baseline flora and fauna assessment.	2012	<ul style="list-style-type: none"> <li>• Baseline flora and fauna survey of Stony Gap Stage 2.</li> <li>• Survey for raptor nests.</li> <li>• Map Vegetation associations.</li> <li>• Map habitat suitable for threatened species.</li> </ul>	EBS Ecology. (2012). <b>Stony Gap Stage 2 Flora and Fauna Survey.</b> Adelaide: Unpublished report to TRUenergy by EBS Ecology.
Targeted flora and fauna survey	2013	<ul style="list-style-type: none"> <li>• Refine existing vegetation and fauna habitat mapping based on revised impact footprint.</li> </ul>	EBS Ecology. (2013). <b>Stony Gap Stage 2 Additional Flora and Fauna Assessments.</b> Adelaide: Unpublished report to Energy Australia by EBS Ecology.
Baseline flora and fauna assessment.	2020	<ul style="list-style-type: none"> <li>• Undertake a desktop assessment to determine the likelihood of occurrence of threatened species and communities.</li> <li>• Undertake field surveys to map native vegetation, ground truth the results of the</li> </ul>	EBS Ecology. (2020). <b>Goyder Hybrid Renewable Energy Facility: Flora and Fauna Assessment.</b> Adelaide: Report to NEOEN by EBS Ecology.

Study	Year	Objectives	Reference
		desktop study and determine the habitat value of the Project Area. <ul style="list-style-type: none"> <li>Identify ecological constraints to consider for Project design.</li> </ul>	
Targeted Pygmy Blue-tongue Lizard survey	2021	<ul style="list-style-type: none"> <li>Determine the presence/absence of Pygmy Blue-tongue Lizards in the proposed impact footprint of the project.</li> </ul>	EBS Ecology. (2021a). <i>Goyder - Pygmy Blue-tongue Lizard Survey March 2021</i> . Adelaide: Report to NEOEN by EBS Ecology.
Targeted survey of Iron-grass Natural Temperate Grassland (INTG) Threatened Ecological Community.	2021	<ul style="list-style-type: none"> <li>Field survey of areas mapped as INTG by EBS Ecology 2020.</li> <li>Determine the condition class of INTG patches according to EPBC Act criteria.</li> <li>Map INTG according to condition classes A, B or C.</li> </ul>	EBS Ecology. (2021b). <i>Goyder South Hybrid Renewable Energy Facility: Flora and Fauna Assessment Addendum</i> . Adelaide: Report to NEOEN by EBS Ecology.

## 2.3. General location map

The proposed **GWF 1 Stage 1A** Project Area is approximately 8159.74ha in size and located in the north-western extent of the Goyder South Project.

The northern end of the Project Area begins approximately 10km south of Burra and is located on the eastern side of the Barrier Highway. The Project Area is approximately 11km long (north-south) and 8.5km wide (west-east) and located across the suburbs of Burra, Hanson, Porter Lagoon, Koonoona and Aposinga, and within the Regional Council of Goyder as shown in the location map in Figure 2.

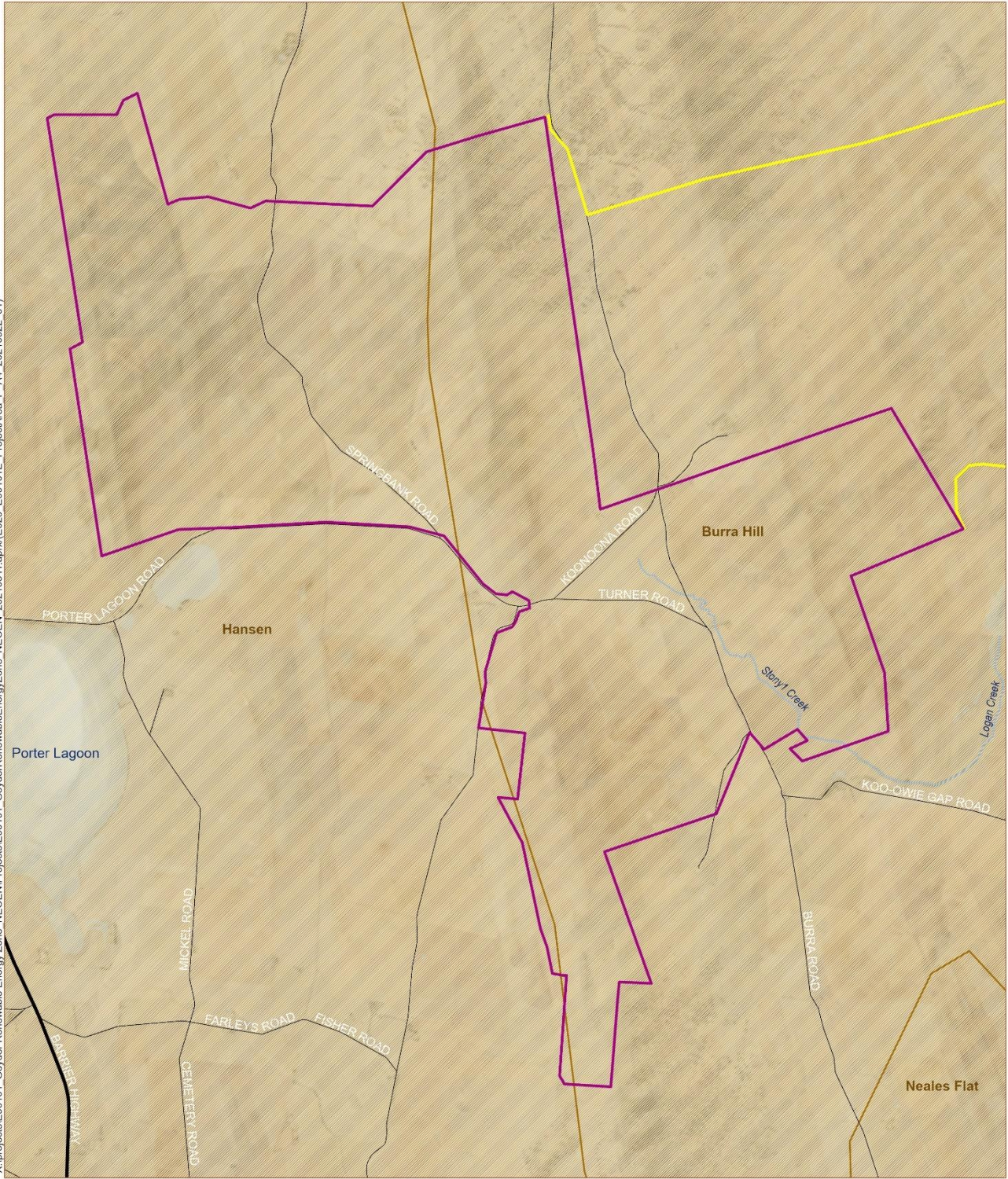
The extents of the Project Area and corresponding native vegetation blocks are shown in Table 5.

**Table 5. Project Area attributes.**

Project Area	Total Extent (ha)	Native Vegetation Blocks	IBRA Association	Total Native Vegetation Extent (ha)
GWF 1 Stage 1A	8159.74	AA	Hansen	1322.65
		AB	Burra Hills	887.82
		<b>TOTAL</b>		<b>2210.47</b>



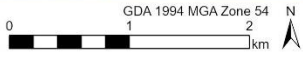
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Data Source: EBS Ecology (2021), ESRI (2021), DEW (2018), DIT (2018), GE (2021)



- Legend**
- GWF - Stage 1A
  - Project area
  - Main road
  - Local road
  - Water course
  - Water body
  - IBRA association



Project Area  
(GWF - Stage 1A)

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Figure 2. General location map of GWF 1 Stage 1A, showing IBRA Association boundaries and watercourses.

## 2.4. Details of the proposal

The proposal involves the construction and operation of 38 wind turbine generators (WTGs) and associated infrastructure for **GWF 1 Stage 1A** (as part of the Goyder South Project).

### Wind Turbine Generators (WTGs)

The 38 WTGs will have a maximum height of 240m, a maximum blade length of 80m, a maximum rotor diameter of 160m and a maximum hub height of 160m. Blades will have non-reflective coatings. Footings may be either a mass concrete footing (raft style), pile-type rock anchors, or a combination of both, and up to 26m in diameter, the vast majority of which would be buried. Each WTG will also have a crane hardstand area of 50m x 30m.

### Access tracks

Access tracks will be constructed to provide access throughout **GWF 1 Stage 1A**. The access tracks will be up to 10m wide during the construction phase to accommodate construction activities and cranes and designed to be of acceptable gradient for South Australian Country Fire Service (CFS) vehicles. Following construction, access tracks will be rehabilitated and reduced to the minimum widths requested by CFS (likely to be 7m). Where required, stormwater drainage, such as open swale drains of between 1-3m in width, will be constructed adjacent to access tracks. In addition, in some sections of access track, batter slopes of between approximately 1-5m may be required.

### Underground cables

Underground cabling will connect the WTGs to Substation West (which is part of a separate stage). Underground cabling for electrical transmission (33kV) and communications (fibre) will generally be located immediately adjacent to access tracks. It will be installed via trenching, which will be approximately 500mm wide per circuit and approximately 1.2m deep, with 900mm coverage over the top of the cables. However, the impact width during installation will be approximately 5m for single cables, plus 1m for each additional cable, as required, with a maximum of 8 cable circuits in some locations.

### Temporary construction compound

A fenced construction compound area of approximately 200m x 420m will be required and will include a site office, staff facilities, a workshop, carpark and laydown/storage area. This will only be a temporary facility and will be rehabilitated post construction.

## 2.5. Approvals required or obtained

### ***Native Vegetation Act 1991***

This native vegetation clearance data report is for the construction and operation of 38 WTGs and associated infrastructure described above (in Section 2.4) for **GWF 1 Stage 1A**. Separate applications in the form of native vegetation clearance data reports will be submitted for other components (stages) of the Goyder South Project, including “GWF 1 Stage 1B” and the “Overhead Transmission Line”.

### ***Planning, Development and Infrastructure Act 2016 (previously Development Act 1993)***

The Goyder South Hybrid Renewable Energy Facility (Application ID: 5332; Application number: 422/V009/20) received Development Approval on 3 March 2021.

### ***Environment Protection and Biodiversity Conservation Act 1999***

Ecological assessment for Goyder South identified the following MNES:

- Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia Threatened Ecological Community (TEC) – listed as Critically Endangered under the EPBC Act
- Iron-Grass Natural Temperate Grassland of South Australia (INTG) TEC – listed as Critically Endangered
- Pygmy Blue-tongue Lizard (PBTL (*Tiliqua adelaidensis*) – listed as Endangered under the EPBC Act
- *Dodonaea subglandulifera* (Peep Hill Hop-bush) – listed as Endangered under the EPBC Act
- *Acacia spilleriana* (Spiller’s Wattle) - listed as Endangered under the EPBC Act
- *Dodonaea procumbens* (Trailing Hop Bush) – listed as Vulnerable under the EPBC Act
- *Olearia pannosa* ssp. *pannosa* (Silver Daisy-bush) – listed as Vulnerable under the EPBC Act

As significant impact assessment determined that the Goyder South Project has the potential to have a significant impact on MNES, the Project has been referred to the Department of Agriculture, Water and the Environment (DAWE) for assessment in accordance with the EPBC Act.

### ***Environment Protection Act 1993***

The construction contractor may require an Earthworks Drainage Licence during construction.

### ***National Parks and Wildlife Act 1972***

EBS Ecology has a Scientific Research Permit (K25613-20) which allows for flora collection.

### ***Landscape South Australia Act 2019***

The Project requires a Water Affecting Activities Permit, which will be obtained prior to any works impacting a water course.

A permit may also be required to transport any declared weeds on a public road.

The requirement for these permits will be discussed with the Northern and Yorke Landscape Management Board and permits obtained where necessary.

### **Aboriginal Heritage Act 1988**

The Goyder South Project requires approval/authorisation under the Aboriginal Heritage Act 1988 and has sought authorisation under Section 21, Section 23 and Section 29 of the Act, with the application currently with the Department of Premier and Cabinet, Aboriginal Affairs and Reconciliation (DPC-AAR) and State Heritage Committee.

### **Native Title Act 1993 (Commonwealth) / Native Title Act 1994 (SA)**

The Goyder South Project does not require approval/authorisation under the Commonwealth *Native Title Act 1993* or SA *Native Title Act 1994*.

## **2.6. Native Vegetation Regulation**

The proposed clearance is suggested to be assessed under Schedule 1 *Regulation 12 (34) Infrastructure*.

### **34 — Infrastructure**

#### **(1) Clearance of vegetation—**

*(a) incidental to the construction or expansion of a building or infrastructure where the Minister has, by instrument in writing, declared that the Minister is satisfied that the clearance is in the public interest; or*

*(b) required in connection with the provision of infrastructure or services to a building or proposed building, or to any place, provided that any development authorisation required by or under the Development Act 1993 has been obtained.*

## **2.7. Development Application information**

The Goyder South Hybrid Renewable Energy Facility (Application ID: 5332; Application number: 422/V009/20) received Development Approval on 3 March 2021.

**Zone:** Rural / Primary Production Zone

**Subzone:** -

**Overlay:** Native Vegetation Overlay

# 3. Method

## 3.1. Flora assessment

The flora assessment was undertaken by NVC Accredited Consultant Jesse Carpenter from 16 – 18 August 2021 in accordance with the Bushland Assessment Method (BAM) (Native Vegetation Council , 2020).

### 3.1.1. *Bushland Assessment Method*

The BAM is derived from the Nature Conservation Society of South Australia's Bushland Condition Monitoring methodology (Croft *et al.* 2007, 2008a, 2008b, 2009; Milne and Croft 2012; Milne and McCallum 2012). The BAM used to assess areas of native vegetation requiring clearance and calculate the SEB requirements.

Details of site selection/stratification and assessment protocols, and the biodiversity value components assessed and the factors that influence these components are outlined in the *Bushland Assessment Manual* (NVC 2020a).

The Conservation Significance Scores were calculated from direct observations of flora and direct and historical observations of fauna species of conservation significance. All fauna identified as known to occur in the PMST, and fauna with BDBSA records since 1995 and with a spatial reliability of less than 1 km, within 5 km of the Project Area, were included in the BAM scoresheets. Species determined as unlikely to occur within the Project Area will be removed by the Native Vegetation Branch if the finding is supported. Marine and/or wetland species were omitted from the scoresheets given the Project Area is terrestrial.

## 3.2. Fauna assessment

A desktop assessment was undertaken to determine the potential for any threatened fauna species, and Threatened Ecological Communities (TECs) (both Commonwealth and State listed) to occur within the Project Area. This was achieved by undertaking database searches using a 5 km buffer of the Project Area (Search Area).

### 3.2.1. *PMST report*

A Protected Matters Search Tool (PMST) report was generated on 6/9/2021 to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act relevant to the Project Area (Department of Agriculture, Water and the Environment, 2021). Only species and Threatened Ecological Communities (TEC) identified in the PMST report that are known to occur within the Search Area were assessed for their likelihood of occurrence within the Project Area.

### 3.2.2. *BDBSA data extract*

A data extract from the Biological Database of South Australia (BDBSA) was obtained from NatureMaps to identify flora and fauna species that have been recorded within 5 km of the Project Area (data extracted 4/8/2021; DEW 2021). The BDBSA is comprised of an integrated collection of species records from the South Australian Museum, conservation organisations, private consultancies, Birds SA, Birdlife Australia and the Australasian Wader Study

Group, which meet the Department for Environment and Water's (DEW) standards for data quality, integrity and maintenance. Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

### **3.2.3. Field survey**

Fauna surveys have been undertaken within the Project Area since 2008 and have included both baseline and targeted surveys for the following:

- Threatened species including the Pygmy Blue-tongue Lizard (*Tiliqua adelaidensis*) and Flinders Ranges Worm Lizard (*Aprasia pseudopulchella*).
- Raptors and raptor nests, including Wedge-tailed Eagle (*Aquila audax*).
- Bats.
- Birds.

Surveys have been conducted in both autumn and spring to account for seasonal movements of fauna and activity such as raptor nesting.

Methods used for these targeted surveys are summarised in Table 6. Other fauna survey methods are documented in the reports listed in Section 2.2.2, including the Attachments 1, 2 and 3.

In 2020, fauna surveys were undertaken in line with the Clean Energy Council's (CEC) *Best Practice Guidelines For Implementation of Wind Energy Projects in Australia* (Clean Energy Council, 2008). According to the guidelines, the aim of the fauna habitat survey should be aimed at identifying important habitat components that are on site including (EBS Ecology, 2020):

- Vegetation communities that support a particular suite of fauna e.g., native grassland species and specific fauna species.
- Trees with hollows which provide shelter sites for arboreal mammals, nest sites for birds and roost/maternity sites for bats.
- Lakes, dams, ponds and streams that may provide habitat for waterbirds and frogs.

**Table 6. Survey methods used for targeted fauna surveys in the Project Area.**

Survey	Year	Methods	Reference
Pygmy Blue-tongue Lizard (PBTL)	2008 2012 2020 2021	<ul style="list-style-type: none"> <li>Active searching of preferred habitat for the presence of spider holes.</li> <li>Burrows were checked using a fibre optic scope for the presence of lizards.</li> </ul>	EBS Ecology 2008b EBS Ecology 2013 EBS Ecology 2021a
Flinders Ranges Worm Lizard	2008 2013	<ul style="list-style-type: none"> <li>Active searching of preferred habitat for the species, including looking under rocks, leaf litter and vegetation cover.</li> </ul>	EBS Ecology 2008b EBS Ecology 2013
Raptor nests	2020	<ul style="list-style-type: none"> <li>Woodland areas assessed for potential nesting locations for Peregrine Falcon (<i>Falco peregrinus</i>) and Wedge-tailed Eagle.</li> <li>Suitable areas searched for the presence of nests.</li> <li>Nests targeted during spring surveys to determine their activity status.</li> </ul>	EBS Ecology 2020
Bats		<ul style="list-style-type: none"> <li>Recording of ultrasonic echolocation calls using Anabat detectors.</li> <li>Harp traps set for three consecutive nights.</li> </ul>	EBS Ecology 2008b EBS Ecology 2012
Birds	2012 2020	<ul style="list-style-type: none"> <li>Fixed point count method, an observer spending 20 minutes at each point.</li> <li>Area search method, an observer spending 20 minutes searching a 1-hectare area.</li> </ul>	EBS Ecology 2012 EBS Ecology 2013

During this survey, dedicated bird surveys were undertaken at each BAM site. Surveys were undertaken using the area search method, whereby an observer actively searches a one-hectare area for birds. A set time period of 20 minutes was used for each search. Sites were surveyed only once.

Other fauna was recorded opportunistically while undertaken the vegetation survey. Any fauna observations made within the Project Area were recorded.

#### **3.2.4. Likelihood of occurrence**

Threatened species identified by the desktop searches were assessed for their likelihood of occurrence in the Project Area. Criteria used for this assessment are described in Table 7.

**Table 7. Criteria for the likelihood of occurrence of threatened species within the Project Area.**

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or; The species was recorded as part of field surveys.
Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides habitat or feeding resources for the species.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area provides limited habitat or feeding resources for the species. Recorded within 20 -40 years, survey effort is considered adequate, habitat and feeding resources present, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within the previous 20 years, but the area provides no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. Recorded within 20 -40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area. No records despite adequate survey effort.

# 4. Assessment outcomes

## 4.1. Vegetation assessment

### 4.1.1. General description of the vegetation, the site and matters of significance

#### Geology and soils

The Project Area is centred on the Bald Hills Range, an area of moderately steep undulating hills interspersed with deep valleys.

Outcropping of sedimentary rocks such as siltstone and sandstone occurs on the higher hills, while valley floors contain alluvial deposits of gravel, sand and colluvium. Soils range from shallow clays and clay-loams over rock on the hills to deep loams and clay-loams in valleys.

#### Protected areas

There are no protected areas within the Goyder South development. However, several occur within 5 km of the Project Area. These are listed in Table 8.

**Table 8. Protected areas near the Goyder South Project Areas.**

Protected Area	Type	Location
Hopkins Creek	Conservation Park	2.7 km south of GWF 1 Stage 1A
Mimbara	Conservation Park	100 m east of the transmission line
HA 1520	Heritage Agreement	4 km south of GWF 1 Stage 1A
HA 1294	Heritage Agreement	3 km west of transmission line
HA 958	Heritage Agreement	4 km west of the transmission line
HA 1221	Heritage Agreement	3 km north-west of GWF 1 Stage 1A

#### Vegetation condition summary

Areas with deeper soil and of least slope have been extensively cleared and cultivated for growing crops and contain little or no native vegetation, with vegetation consisting of either crops or exotic grassland. Where these areas have not been cleared or cultivated recently, open tussock grasslands dominated by either *Austrostipa* spp. (Figure 4) or *Lomandra* spp. (Figure 5) are widespread, with *Austrostipa* spp. Open Grassland extensively distributed throughout the Project Area.

Treed habitats are limited to the north-east and southern extremities of the Project Area. Here, remnant open woodlands of *Eucalyptus leucoxylon* ssp. *pruinosa* (Figure 6), *Allocasuarina verticillata* (Figure 7) or *Callitris gracilis*. These woodlands have a grassy or sparse shrub understorey consisting of exotic and native grasses including *Austrostipa* spp. and *Avena* sp., with sparse shrubs of *Bursaria spinosa* and *Correa glabra* ssp. *turnbullii*. These woodlands occur as small patches and are highly fragmented from nearby similar vegetation.



Native grasslands are generally in poor condition and vary little throughout the Project Area. However, there are some areas in a moderate condition, particularly patches dominated by *Lomandra* sp. Some grasslands include emergent trees or long-dead trees and logs indicating they were probably once woodland. Other vegetation types vary considerable in condition, ranging from poor to good, depending on land use history, current land use and topography.

Regardless of condition, all vegetation in the Project Area is impacted by grazing and weed encroachment. Grassland associations appear heavily grazed, with palatable emergent shrubs often over-utilised with little or no regeneration occurring (Figure 8). Some regeneration of shrubs was observed within grasslands where steep terrain or rock outcrops provided some protection from grazing (Figure 9).

Thirty species of weeds were recorded, including five species of plants Declared under the *Landscape South Australia Act 2019* (LSA Act) (Table 9). Seventy-three species of native plants were recorded during this survey, with a further 60 species recorded by past surveys (Appendix 2).

**Table 9. Plants Declared as weeds under the *Landscape South Australia Act 2019* recorded during the survey.**

Scientific Name	Common Name	Vegetation Association
<i>Cirsium vulgare</i>	Spear Thistle	VA8
<i>Marrubium vulgare</i>	Horehound	VA2, VA8, VA6
<i>Oxalis pes-caprae</i>	Sour-sob	VA8
<i>Rosa canina</i>	Dog Rose	VA8
<i>Solanum elaeagnifolium</i>	Silver Nightshade	VA2, VA8

Remnant woodland provides important habitat in the project Area, which is largely otherwise treeless. Grasslands in better condition also provide habitat, particularly for the EPBC Act Endangered species Pygmy Blue-tongue Lizard. Hill tops and steep slopes often have significant rock outcrops that are known to provide habitats for fauna such as bats and reptiles.

### **Vegetation Association summary**

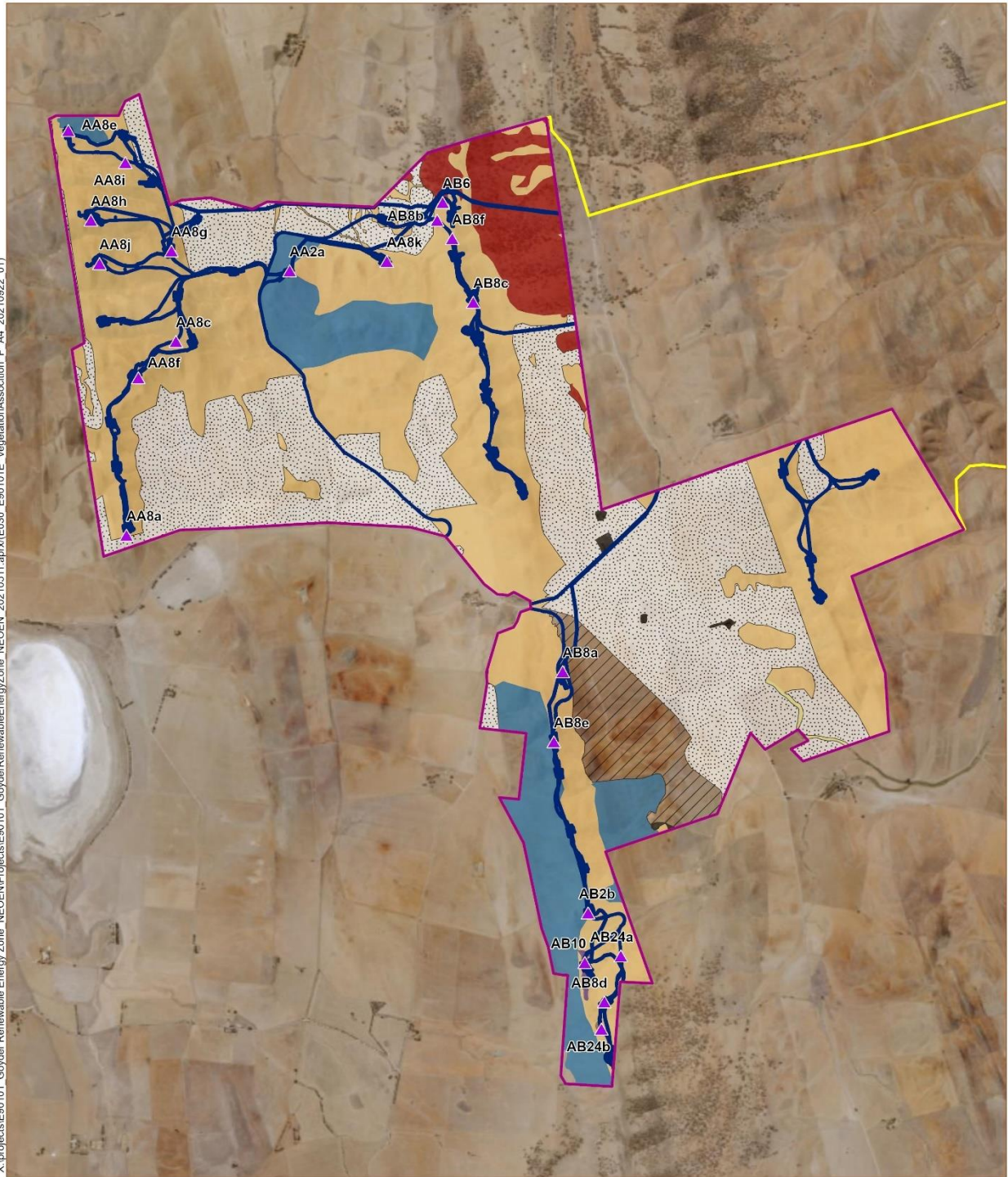
Vegetation Associations (VA) for the entire Goyder South were mapped by EBS Ecology in 2020 (EBS Ecology, 2020) and further refined considering the results of this survey. Twenty-four VA were mapped in total, as listed in Table 10, with those within **GWF 1 Stage 1A** shown in Figure 3. Of these, only five will be impacted by GWF 1 Stage 1A, as indicated in Table 10.

The five VA impacted by **GWF 1 Stage 1A** are described in further detail in Section 4.1.2. All other VA have been described in EBS Ecology 2020 (Attachment 1).

**Table 10. Vegetation Associations (VA) mapped in the Project Area. The table indicates the total extent of each VA and the extent expected to be impacted by the Goyder South project.**

VA Code	VA Description	Total Extent Within Project Area (ha)	Total Area Impacted (ha)	Per-cent Impacted
VA1	<i>Maireana aphylla</i> (Cotton-bush) / <i>Atriplex stipitata</i> (Bitter Saltbush) Mixed Low Open Chenopod Shrubland.	0	0	0
VA2	<i>Lomandra multiflora</i> ssp. <i>dura</i> (Hard Mat-rush) / <i>Lomandra effusa</i> (Scented Mat-rush) Mixed Open Grassland.	365.61	11.06	3
VA3	<i>Eucalyptus porosa</i> (Mallee Box) Open Woodland.	0	0	0
VA4	<i>Eucalyptus odorata</i> (Peppermint Box) Closed Woodland.	0.06	0	0
VA5	<i>Eucalyptus oleosa</i> ssp. <i>oleosa</i> (Red Mallee) Mixed Open Mallee.	0	0	0
VA6	<i>Eucalyptus leucoxydon</i> ssp. <i>pruinosa</i> (Inland South Australian Blue Gum) Open Woodland.	175.9	4.29	2
VA7	<i>Eucalyptus camaldulensis</i> ssp. <i>camaldulensis</i> (River Red Gum) Woodland.	0	0	0
VA8	<i>Austrostipa</i> spp. (Spear Grass) Mixed Grassland.	1659.60	115.90	7
VA9	Exotic Grassland.	171.50	2.11	1
VA10	<i>Callitris gracilis</i> (Southern Cypress Pine) Low Open Woodland.	4.35	1.52	35
VA11	<i>Juncus</i> sp. (Rush) / <i>Cyperus gymnocaulos</i> (Spiny Flat-sedge) Mixed Low Closed Sedgeland.	4.22	0	0
VA12	<i>Alectryon oleifolius</i> ssp. <i>canescens</i> (Bullock Bush) Low Open Woodland.	0	0	0
VA13	<i>Atriplex nummularia</i> (Old-man Saltbush) Plantation.	0	0	0
VA14	<i>Triodia irritans</i> (Spinifex) Grassland +/- Emergent <i>Eucalyptus oleosa</i> ssp. <i>oleosa</i> (Red Mallee).	0	0	0
VA15	<i>Dodonaea lobulata</i> (Lobed-leaf Hop-bush) Shrubland.	0	0	0
VA16	<i>Beyeria lechenaultii</i> (Pale Turpentine Bush) Low Shrubland.	0	0	0
VA17	<i>Phragmites australis</i> (Common Reed) Grassland.	0	0	0
VA18	<i>Senna</i> spp. (Senna) / <i>Acacia rigens</i> (Nealie) Mixed Shrubland over Chenopod Shrubs.	0	0	0
VA19	<i>Nitraria billardierei</i> (Nitre-bush) Low Shrubland.	0	0	0
VA20	<i>Maireana pyramidata</i> (Black Bluebush) Low Shrubland.	0	0	0
VA21	<i>Eucalyptus gracilis</i> (White Mallee) Open Woodland	0	0	0
VA22	<i>Eucalyptus porosa</i> Open Woodland over <i>Eremophila</i> sp., <i>Acacia papyrocarpa</i> and <i>Maireana</i> spp.	0	0	0
VA23	<i>Eucalyptus porosa</i> / <i>Eucalyptus gracilis</i> Mixed Mallee	0	0	0
VA24	<i>Allocasuarina verticillata</i> Open Woodland over <i>Bursaria spinosa</i> ssp. <i>spinosa</i> and <i>Austrostipa</i> spp.	0.74	0.22	30
<b>TOTAL</b>		<b>2210.47</b>	<b>132.99</b>	<b>6</b>

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Data Source: EBS Ecology (2021), ESRI (2021), DEW (2018), DIT (2018), GE (2021)

**Legend**

- GWF - Stage 1A
- Project area
- ▲ BAM Stage 1A site
- GWF - Infrastructure
- Vegetation association**
- 2. *Lomandra multiflora* ssp. *Dura* (Hard Mat-rush) / *Lomandra effusa* (Scented Mat-rush) Mixed Open Grassland
- 4. *Eucalyptus odorata* (Peppermint Box) Closed Woodland
- 6. *Eucalyptus leucoxylo*n ssp. *Pruinosa* (Inland South Australian Bluegum) Open Woodland
- 8. *Austrostipa* spp. (Spear Grass) Mixed Grassland
- 9. Exotic Grassland
- 10. *Callitris gracilis* (Southern Cypress Pine) Low Open Woodland
- 11. *Juncus* sp. (Rush) / *Cyperus gymnocaulos* (Spiny Flat-sedge) Mixed Low Closed Sedgeland
- 24. *Allocasuarina verticillata* Open Woodland over *Bursaria spinosa* ssp. and *Austrostipa* spp.
- Amenity / Urban
- Cropping



**Vegetation Associations (GWF - Stage 1A)**



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**Figure 3. Vegetation Associations of the GWF 1 Stage 1A Project Area. The impact footprint is also shown.**

#### **4.1.2. Details of the vegetation associates/scattered trees proposed to be impacted**

Of the 23 VA in the Project Area, it is expected that five will be impacted by the **GWF 1 Stage 1A** development. These five associations are described in Table 11 to Table 15.

Table 11. Summary of VA2.




<b>Vegetation Association</b>	<i>Lomandra multiflora</i> ssp. <i>dura</i> (Hard Mat-rush) / <i>Lomandra effusa</i> (Scented Mat-rush) Mixed Open Grassland.				
<b>Benchmark Community</b>	Northern Agricultural 3.2 Grasslands				
<b>BAM survey sites</b>	AA2a AB2a AB2b				
					
<b>AA2a</b>			<b>AB2b</b>		
<b>General description</b>	<p>Grasslands dominated by <i>Lomandra effusa</i> / <i>Lomandra multiflora</i> ssp. <i>dura</i> and <i>Austrostipa</i> spp. Native forb species are sparse, but include species such as <i>Oxalis perennans</i>, <i>Einadia nutans</i> ssp. <i>nutans</i> and <i>Bulbine bulbosa</i>.</p> <p>The association usually occurs on upper and mid slopes of hills on areas of shallow soils and often with rock outcrops. Most sites are without shrubs or trees, although emergent low shrubs are present in some areas.</p> <p>High weed cover is present at most sites, with grasses such as <i>Avena barbata</i> and forbs including <i>Erodium botrys</i>, <i>Moraea setifolia</i> and <i>Romulea</i> spp. dominating large areas. Declared weeds include <i>Marrubium vulgare</i>, <i>Lycium ferocissimum</i> and <i>Rosa canina</i>.</p> <p>The association is heavily grazed by sheep and cattle.</p>				
<b>Threatened species or community</b>	<ul style="list-style-type: none"> <li>• Iron-grass Natural Temperate Grassland - Known</li> <li>• Pygmy Blue-tongue Lizard - Known</li> <li>• Flinders Ranges worm Lizard - Likely</li> <li>• Fork-tailed Swift - Possible</li> <li>• Australian Bustard - Possible</li> <li>• Brown Quail – Highly Likely</li> <li>• Peregrine Falcon - Known</li> <li>• Blue-winged Parrot - Possible</li> <li>• Elegant Parrot – Known</li> <li>• <i>Eryngium ovinum</i></li> </ul>				
<b>Landscape context score</b>	1.22 (Block AA) 1.19 (Block AB)	<b>Vegetation Condition Score</b>	8.39 (AB2b) – 17.03 (AA2a)	<b>Conservation significance score</b>	1.5
<b>Unit biodiversity Score</b>	31.16 (Block AA) 14.97 (Block AB)	<b>Area (ha)</b>	11.06	<b>Total biodiversity Score</b>	227.62

Table 12. Summary of VA6.

<b>Vegetation Association</b>	<i>Eucalyptus leucoxylon</i> ssp. <i>pruinosa</i> (South Australian Blue Gum) Open Woodland
<b>Benchmark Community</b>	Northern Agricultural 3.1 Woodlands with an Open Grassy Understorey.
<b>BAM survey sites</b>	AB6
	
<p><b>AB6</b></p>	
<b>General description</b>	<p>Open woodland with a grassy understorey dominated by the overstorey species <i>Eucalyptus leucoxylon</i> ssp. <i>pruinosa</i>, with an understorey of exotic forbs and native grasses including <i>Austrostipa</i> spp., <i>Arctotheca calendula</i>, <i>Medicago</i> sp. and <i>Salvia verbenaca</i>.</p> <p>The association occurs in the north-east of the Project Area on western facing slopes on shallow clay-loam soils, with vegetation condition improving up slope, away from the impact footprint.</p> <p>Weeds are dominant in the understorey, although some native grasses and forbs are present, with the declared weed <i>Marrubium vulgare</i> recorded beneath tree canopies. The woodland is extensively grazed by stock and kangaroos.</p> <p>The association contains the largest trees in the Project Area, many of which contain at least small hollows. They represent an important habitat element in the wider landscape of the Project Area.</p>
<b>Threatened species or community</b>	<ul style="list-style-type: none"> <li>• Flinders Ranges worm Lizard - Likely</li> <li>• Fork-tailed Swift - Possible</li> <li>• Australian Bustard - Possible</li> <li>• Brown Quail – Highly Likely</li> <li>• Peregrine Falcon - Known</li> <li>• Blue-winged Parrot - Possible</li> <li>• Elegant Parrot – Known</li> <li>• White-winged Chough – Known</li> <li>• Little Eagle – Likely</li> <li>• Hooded Robin – Known</li> <li>• Black-chinned Honeyeater – Possible</li> <li>• Jacky Winter – Likely</li> <li>• Satin Flycatcher – Known</li> <li>• Restless Flycatcher – Known</li> </ul>

	<ul style="list-style-type: none"> <li>• Scarlet Robin – Possible</li> <li>• Striped Honeyeater – Possible</li> <li>• Diamond Firetail – Known</li> <li>• Common Brushtail Possum – Possible</li> <li>• Painted Button-quail - Possible</li> </ul>				
<b>Landscape context score</b>	1.19	<b>Vegetation Condition Score</b>	21.18	<b>Conservation significance score</b>	1.1
<b>Unit biodiversity Score</b>	27.72	<b>Area (ha)</b>	4.29	<b>Total biodiversity Score</b>	118.91

Table 13. Summary of VA8.

<b>Vegetation Association</b>	<i>Austrostipa</i> spp. (Spear Grass) Mixed Grassland.	
<b>Benchmark Community</b>	Northern Agricultural 3.1 Woodlands with an Open Grassy Understorey. Northern Agricultural 3.2 Grasslands	
<b>BAM survey sites</b>	AA8a	AB8a
	AA8b	AB8b
	AA8c	AB8c
	AA8d	AB8d
	AA8e	AB8e
	AA8f	AB8f
	AA8g	
	AA8h	
	AA8i	
	AA8j	
	AA8k	

	
<p>AA8a</p>	<p>AA8c</p>
	
<p>AA8e</p>	<p>AA8f</p>





AA8g



AA8h



AA8i



AA8j



AA8k



AB8a



AB8b



AB8c



AB8d



AB8e



AB8f

**General description**


This association is represented by mostly poor condition open grassland. Native and exotic grasses occur as co-dominant including *Austrostipa* spp., *Aristida behriana*, *Rytidosperma* sp. and *Avena barbata*. Beneath the grasses, the understorey is dominated by the exotic forbs *Erodium botrys*, *Romulea* sp. and *Morea setifolia*. Areas in better condition have a higher cover of native forbs and spring annuals such as *Oxalis perennans*, *Enchylaena enchylaenoides*, *Pauridia glabella* and *Bulbine bulbosa*.

Trunk-sized logs and long-dead trees are present in some patches of this grassland indicating that they were, at least in some areas, previously part of a woodland community.

The most widespread vegetation association in the Project Area, found wherever previously wooded areas have been cleared and soils have not been cultivated. It occurs in all landscape positions and on a range of soil types.



	These grasslands are subject to significant grazing pressure from stock, with areas dominated by introduced plant species and present little habitat value for fauna. However, they are recognised as important habitat for the threatened Pygmy Blue-tongue Lizard.				
<b>Threatened species or community</b>	<ul style="list-style-type: none"> <li>• Pygmy Blue-tongue Lizard (EPBC Act Endangered)</li> <li>• Flinders Ranges worm Lizard - Likely</li> <li>• Fork-tailed Swift - Possible</li> <li>• Australian Bustard - Possible</li> <li>• Brown Quail – Highly Likely</li> <li>• Peregrine Falcon - Known</li> <li>• Blue-winged Parrot - Possible</li> <li>• Elegant Parrot - Known</li> <li>• <i>Cryptandra campanulata</i> - Known</li> <li>• <i>Eryngium ovinum</i> - Known</li> </ul>				
<b>Landscape context score</b>	1.22 (Block AA) 1.19 (Block AB)	<b>Vegetation Condition Score</b>	2.13 (AA8f) – 26.41 (AA8j)	<b>Conservation significance score</b>	1.1 – 1.8
<b>Unit biodiversity Score</b>	15.43 (Mean AA) 16.10 (Mean AB)	<b>Area (ha)</b>	115.9	<b>Total biodiversity Score</b>	1854.46

Table 14. Summary of VA10.

<b>Vegetation Association</b>	<i>Callitris gracilis</i> (Southern Cypress Pine) Low Open Woodland.
<b>Benchmark Community</b>	Northern Agricultural 3.1 Woodlands with an Open Grassy Understorey.
<b>BAM survey sites</b>	AB10
	
<b>A19a</b>	
<b>General description</b>	<p>Low open woodland dominated by <i>Callitris gracilis</i>, with <i>Allocasuarina verticillata</i> also present. An open shrub midstorey is present with species such as <i>Pultenaea kraehenbuehlii</i>, <i>Senna artemisioides</i> ssp. <i>petiolaris</i> and <i>Enchylaena tomentosa</i> dominating. The understorey is predominantly grassy, with some forbs cover and includes species such as <i>Themeda triandra</i>, <i>Austrostipa</i> spp., <i>Cheilanthes austrotenuifolia</i>, <i>Einadia nutans</i> and <i>Vittadinia cuneata</i>.</p> <p>The association occurs on rocky upper slopes in the south of the Project Area, with significant rock outcrops a feature. These outcrops provide some habitat and protection from grazing for palatable shrub species.</p> <p>The association becomes increasingly impacted by weeds towards the edge of patches, with exotic plant species such as <i>Avena barbata</i>, <i>Arctotheca calendula</i> and <i>Erodium botrys</i> becoming increasingly dominant. Palatable shrubs are also heavily grazed by stock and other herbivores such as kangaroos.</p>
<b>Threatened species or community</b>	<ul style="list-style-type: none"> <li>• Flinders Ranges worm Lizard - Likely</li> <li>• Fork-tailed Swift - Possible</li> <li>• Australian Bustard - Possible</li> <li>• Brown Quail – Highly Likely</li> <li>• Peregrine Falcon - Known</li> <li>• Blue-winged Parrot - Possible</li> <li>• Elegant Parrot – Known</li> <li>• White-winged Chough – Known</li> <li>• Little Eagle – Likely</li> </ul>

	<ul style="list-style-type: none"> <li>• Hooded Robin – Known</li> <li>• Jacky Winter – Likely</li> <li>• Satin Flycatcher – Known</li> <li>• Restless Flycatcher – Known</li> <li>• Scarlet Robin – Possible</li> <li>• Striped Honeyeater – Possible</li> <li>• Diamond Firetail – Known</li> <li>• Common Brushtail Possum – Possible</li> <li>• Painted Button-quail – Possible</li> <li>• Chestnut-backed Quailthrush - Possible</li> <li>• <i>Philotheca verrucosa</i> - Known</li> <li>• <i>Pultenaea kraehenbuehlii</i> - Known</li> </ul>				
<b>Landscape context score</b>	1.19	<b>Vegetation Condition Score</b>	31.72	<b>Conservation significance score</b>	1.18
<b>Unit biodiversity Score</b>	44.54	<b>Area (ha)</b>	1.52	<b>Total biodiversity Score</b>	67.62

Table 15. Summary of VA24.

<b>Vegetation Association</b>	<i>Allocasuarina verticillata</i> Very Open Woodland over <i>Bursaria spinosa</i> and <i>Austrostipa</i> spp.				
<b>Benchmark Community</b>	Northern Agricultural 3.1 Woodlands with an Open Grassy Understorey				
<b>BAM survey sites</b>	AB24a AB24b				
					
	AB24a		AB24b		
<b>General description</b>	<p>Very open woodland of <i>Allocasuarina verticillata</i> over sparse shrubs of <i>Bursaria spinosa</i>, <i>Correa glabra</i> var. <i>turnbullii</i> and <i>Dodonaea viscosa</i> with a grassy understorey dominated by grasses <i>Austrostipa</i> spp., <i>Themeda triandra</i> and a range of annual and perennial forbs such as <i>Bulbine bulbosa</i>, <i>Wurmbea dioica</i>, <i>Gonocarpus elatus</i> and <i>Astroloma humifusum</i>.</p> <p>Situated on shallow, rocky clay soils on hill and ridge tops, rock outcrops are prominent. The association is limited in extent to small, fragmented patches in the south of the Project Area.</p> <p>Weeds are common including <i>Avena barbata</i>, <i>Romulea</i> spp., <i>Gomphocarpus cancellatus</i> and <i>Arctotheca calendula</i>. Palatable shrubs are heavily utilised by grazing stock and kangaroos, with only shrubs protected by rock outcrops largely intact.</p>				
<b>Threatened species or community</b>	<ul style="list-style-type: none"> <li>• Flinders Ranges worm Lizard - Likely</li> <li>• Fork-tailed Swift - Possible</li> <li>• Australian Bustard - Possible</li> <li>• Brown Quail – Highly Likely</li> <li>• Peregrine Falcon - Known</li> <li>• Blue-winged Parrot - Possible</li> <li>• Elegant Parrot – Known</li> <li>• White-winged Chough – Known</li> <li>• Little Eagle – Likely</li> <li>• Hooded Robin – Known</li> <li>• Jacky Winter – Likely</li> <li>• Satin Flycatcher – Known</li> <li>• Restless Flycatcher – Known</li> <li>• Scarlet Robin – Possible</li> <li>• Striped Honeyeater – Possible</li> <li>• Diamond Firetail – Known</li> <li>• Common Brushtail Possum – Possible</li> <li>• Painted Button-quail – Possible</li> <li>• <i>Cryptandra campanulata</i> - Known</li> <li>• <i>Pultenaea kraehenbuehlii</i> - Known</li> <li>• <i>Rumex dumosus</i> - Known</li> </ul>				
<b>Landscape context score</b>	1.19	<b>Vegetation Condition Score</b>	36.98	<b>Conservation significance score</b>	1.34 (AB24a) – 1.38 (AB24b)
<b>Unit biodiversity Score</b>	59.69	<b>Area (ha)</b>	0.22	<b>Total biodiversity Score</b>	1580.78

#### **4.1.3. Site map showing areas of proposed impact**

A map showing the proposed design of the project including the impact footprint and the vegetation subject to this clearing application is provided as Figure 3. The map indicates the blocks of vegetation, delineated by IBRA Environmental Association, and the location of BAM survey sites. Note that the map shows vegetation mapping for the entire Project Area, only a proportion of which will be impacted.

#### 4.1.4. Photo log



Figure 4. Tussock grassland dominated by *Austrostipa* spp.



Figure 5. Tussock grassland dominated by *Lomandra* spp.



Figure 6. *Eucalyptus leucoxylon* ssp. *pruinosa* Open Woodland over exotic and native grasses in the north-eastern corner of the Project Area.



Figure 7. *Allocasuarina verticillata* Open Woodland with a grassy understorey and sparse shrubs in the far south of the Project Area.



Figure 8. Heavily grazed *Dodonaea viscosa*. This is typical of the level of grazing impact to palatable shrubs in heavily grazed parts of the Project Area.



Figure 9. Shrubs, such as these *Correa glabra* var. *turnbullii*, were present in grassland associations were protected from grazing.



## 4.2. Threatened species assessment

### 4.2.1. Threatened fauna

The database search identified 47 threatened and migratory fauna species as having potential to occur within 5 km of the Project Area. Given vegetation and habitat occurring on the site, 21 have been assessed as at least possible of occurring in the Project Area, and these are listed in Table 16. An assessment of likelihood for all 47 species is provided in Appendix 3.

Throughout the history of the project, surveys have recorded 122 species of fauna, including one frog, six reptiles, 21 mammals and 94 bird species in the Project Area and adjoining stages of the Project (Appendix 4). This includes eight threatened species:

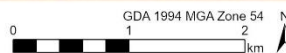
- White-winged Chough (*Corcorax melanorhamphos*); NPW Act Rare.
- Peregrine Falcon (*Falco peregrinus*); NPW Act Rare.
- Hooded Robin (*Melanodryas cucullata*); NPW Act Rare.
- Satin Flycatcher (*Myiagra cyanoleuca*); NPW Act Endangered.
- Restless Flycatcher (*Myiagra inquieta*); NPW Act Rare.
- Elegant Parrot (*Neophema elegans*); NPW Act Rare
- Diamond Firetail (*Stagonopleura guttata*); NPW Act Vulnerable.
- Pygmy Blue-tongue Lizard (*Tiliqua adelaidensis*); EPBC Act Endangered.

Two of these species, White-winged Chough and Diamond Firetail, were again recorded during this survey. The locations of Pygmy Blue-tongue Lizard records collected by EBS Ecology are mapped in Figure 10

One Wedge-tailed Eagle nest occurs in the **GWF 1 Stage 1A** Project Area (Figure 10). The nest was found to be in good condition and likely to have been used in the previous one or two years.



Data Source: EBS Ecology (2021), ESRI (2021), DEW (2018), DIT (2018), GE (2021)



**Legend**

- █ GWF - Stage 1A
- █ Project area
- █ GWF - Infrastructure
- ★ WTE nest
- PBTB record
- *Acacia spilleriana*
- ★ *Dodonaea procumbens*
- █ Pygmy habitat
- █ Likely
- █ Potential

**Threatened Species  
(GWF - Stage 1A)**

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**Figure 10. Records of EPBC Act listed threatened species and Wedge-tailed Eagle nests collected by EBS Ecology. Areas of potentially suitable Pygmy Bluetongue Lizard (PBTB) habitat are also shown.**

**Table 16. Likelihood of occurrence of threatened fauna identified in the desktop assessment. The data source and threat levels are described in the table footer.**

Scientific Name	Common Name	EPBC Act	NPW Act	Date of last record	Data Source	Species known habitat preferences	Likelihood of use for habitat
<i>Aprasia pseudopulchella</i>	Flinders Worm-lizard	VU		2016	1, 2	The Flinders Ranges Worm-lizard is known from the Flinders Ranges of South Australia, extending south to the western slopes and northern and central Mount Lofty Ranges. It is also found in the northern suburbs of Adelaide and the Mount Remarkable National Park. The species is known to occur within the Adelaide and Mount Lofty Ranges and the South Australian Arid Lands Natural Resource Management Region. Occurs in open woodland, native tussock grassland, riparian habitats and rocky isolates.	Likely
<i>Apus pacificus</i>	Fork-tailed Swift	Mi			2	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	Possible
<i>Ardeotis australis</i>	Australian Bustard		V	2018	1	Mainly occurs in inland Australia and is now scarce or absent from southern and south-eastern Australia. Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams.	Possible
<i>Cinclosoma castanotum</i>	Chestnut-backed Quailthrush (Chestnut Quailthrush)		R	2012	1	Endemic to arid and semi-arid southern Australia, reaching its northern extent in the south of the Northern Territory. Throughout its distribution it occurs in a wide range of arid and semi-arid habitats; mainly in the low shrubs and undergrowth of mallee scrub, but also in Acacia scrubs, dry sclerophyll woodland, heath, and native pine.	Possible
<i>Corcorax melanorhamphos</i>	White-winged Chough		R	2021	1, 3, 5	White-winged Choughs are found in open forests and woodlands. They tend to prefer the wetter areas, with lots of leaf-litter, for feeding, and available mud for nest building.	Known
<i>Coturnix ypsilophora australis</i>	Brown Quail		V	2015	1	Found across northern and eastern Australia, from the Kimberley region in Western Australia to Victoria and Tasmania, as well as in south-western Australia. It is also found in Papua New Guinea and Indonesia, and has been introduced to New Zealand. Prefers dense grasslands, often on the edges of open forests, and bracken. May sometimes be seen alongside roads.	Highly likely
<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	2012	1, 3	This species prefers open habitats such as grasslands, tundra and meadows and nests on cliff faces and in crevices. It has an extremely large range and is found world-wide except for rainforests and cold, dry Arctic regions. This species has increasingly been observed inhabiting urban areas.	Known
<i>Hieraetus morphnoides</i>	Little Eagle		V	2016	1	The Little Eagle is widespread in mainland Australia, central and eastern New Guinea. It is seen over woodland and forested lands and open country, extending into the arid zone. It tends to avoid rainforest and heavy forest.	Likely

Scientific Name	Common Name	EPBC Act	NPW Act	Date of last record	Data Source	Species known habitat preferences	Likelihood of use for habitat
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (YP, MN, AP, MLR, MM, SE)		R	2019	1, 3	Occurs across south-eastern Australia, most of NSW, VIC and south-eastern SA. South-eastern subspecies found in Eucalypt woodland and Mallee and Acacia shrubland.	Known
<i>Melithreptus gularis</i>	Black-chinned Honeyeater		V	2006	1	The Black-chinned Honeyeater is found in the upper levels of open eucalypt forests and woodlands dominated by box and ironbark eucalypts. It is often found along waterways, especially in arid and semi-arid areas and in northern Australia. It is occasionally seen in gardens and street trees.	Possible
<i>Microeca fascians fascians</i>	Jacky Winter (MLR, SE)		R	2017	1	Widely distributed throughout mainland Australia. Prefer open woodland (Eucalypt and mallee) with an open shrub layer and bare ground. Often seen in farmland and parks.	Likely
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi	E	2019	1, 2, 3	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season.	Known
<i>Myiagra inquieta</i>	Restless Flycatcher		R	2019	1, 3	Found throughout northern and eastern mainland Australia, as well as in south-western Australia. The Restless Flycatcher is found in open forests and woodlands and is frequently seen in farmland.	Known
<i>Neophema chrysostoma</i>	Blue-winged Parrot		V	2001	1	This species mainly occurs in Tasmania and Victoria, particularly in southern Victoria and the midlands and eastern areas of Tasmania however sparser populations are also found in western New South Wales and eastern South Australia, extending to south-west Queensland and occasionally into the Northern Territory. Prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones.	Possible
<i>Neophema elegans elegans</i>	Elegant Parrot		R	2019	1, 3	The Elegant Parrot occurs in western Victoria and south-western New South Wales (along the lower reaches of the Darling River), eastern parts of South Australia, north to the Flinders Ranges and west to the Eyre Peninsula, and also in Western Australia. Inhabiting open habitats, the Elegant Parrot can be found in a wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland.	Known
<i>Petroica boodang boodang</i>	Scarlet Robin		R	2008	1	Found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. Lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	Possible
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	2017	1	The Striped Honeyeater is found in eastern Australia, mainly inland, from the Yorke Peninsula, South Australia to the coast of New South Wales, around Toukley, and north to Charters Towers, Queensland. The Striped Honeyeater is found in forests and woodlands, often along rivers, as well as mangroves and in urban gardens.	Possible

Scientific Name	Common Name	EPBC Act	NPW Act	Date of last record	Data Source	Species known habitat preferences	Likelihood of use for habitat
<i>Stagonopleura guttata</i>	Diamond Firetail		V	2021	1	Endemic to Australia, occurring mainly on the inland slopes of the Great Dividing Range and in the AMLR/Eyre Peninsula region of SA. Reside in a wide range of Eucalypt dominated vegetation communities that have a grassy understorey, including woodland, forest and mallee. Most occur on the inland slopes of the Great Dividing Ranges, with only small pockets near the coast.	Known
<i>Tiliqua adelaidensis</i>	Pygmy Blue-tongue	EN	E	2021	1, 2, 3, 4	All known populations are located on private land, most of which is used for sheep grazing. The vegetation of all known sites is remnant native grassland or grassy woodland with a sparse over-storey of trees. Pygmy Blue-tongue Lizards do not appear to be confined to a particular floristic community of native grassland, and have been recorded at sites dominated by species including spear grasses ( <i>Austrostipa spp.</i> ), wallaby grasses ( <i>Rytidosperma spp.</i> ), bluebush ( <i>Maireana spp.</i> ), Brush Wire-grass ( <i>Aristida behriana</i> ) and iron-grasses ( <i>Lomandra spp.</i> ).	Known
<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	2008	1	Anywhere where trees with suitable hollows occur, including open forests and woodlands but also urban areas and cities. The species can be common in urban areas. One of the best-known marsupials; found in most treed environments, including cities, towns and farmland. Reintroduced to many locations, including the Flinders Ranges, along the River Murray (extant) and on Thistle Island (extant).	Possible
<i>Turnix varius varius</i>	Painted Buttonquail		R	2015	1	These birds range almost continuously, in appropriate habitat, from about the Atherton Tableland in Qld, round the coast to the Eyre Peninsula and north to the southern Flinders Ranges in SA, avoiding only the driest regions of Qld and NSW. Temperate and eastern tropical forests and woodlands form the habitats of this species. They appear to prefer closed canopies with some understorey and deep leaf litter on the ground.	Possible

EPBC Act: Ex = Extinct; CR = Critically Endangered; EN = Endangered; VU = Vulnerable.

NPW Act: E = Endangered; V = Vulnerable; R = Rare.

Source: 1 = BDBSA; 2 = Protected Matters Search Tool; 3 = EBS Ecology 2020; 4 = EBS Ecology 2021a; 5 = This survey.

#### 4.2.2. Threatened flora

The database search identified 77 threatened flora species as having potential to occur within 5 km of the Project Area. Of these, 34 are at least possibly occur in the Project Area based on habitat available on the site. These 34 species and their likelihood of occurring in the Project Area are listed in Table 18. An assessment of likelihood for all 77 species is provided in Appendix 3.

Eleven threatened flora species have been recorded in the Project Area, as listed in Table 17. Five were recorded during this survey, as indicated in the table. Some records are outside of the area to be impacted by the Project, including the known locations of EPBC listed *Acacia spilleriana* and *Dodonaea procumbens* (Figure 10).

**Table 17. Threatened plant species recorded in the Project Area during the current and past surveys.**

Scientific Name	Common Name	Status		Recorded during this survey	Vegetation Association	Comments
		EPBC Act	NPW Act			
<i>Acacia spilleriana</i>	Spiller's Wattle	EN	E	No	VA8	Several individuals have been recorded in roadside vegetation in the Stage 1A Project Area. They are outside the impact footprint of the project.
<i>Cryptandra campanulata</i>	Long-flowered Cryptandra		R	Yes	VA8, VA24	Distributed throughout these vegetation associations.
<i>Dodonaea procumbens</i>	Trailing Hop-bush	VU	V	No	VA2	Single population of limited distribution in the central Project Area. The population is outside the impact footprint of the project.
<i>Eryngium ovinum</i>	Blue Devil		V	Yes	VA2, VA8	Uncommon, but individuals have been located throughout these vegetation associations.
<i>Maireana rohrlachii</i>	Rohrlach's Blue Bush		R	No	VA2, VA8	Uncommon, but individuals have been located throughout these vegetation associations.
<i>Mentha satureioides</i>	Native Pennyroyal		R	No	VA8	Found at one location in VA8 in a valley floor that will not be impacted by the project.
<i>Philotheca verrucosa</i>	Bendigo Wax-flower		V	Yes	VA10	Widely distributed throughout the patch of VA10 at BAM site AB10.
<i>Ptilotus erubescens</i>	Hairy Tails		R	No	VA2, VA8	Uncommon, but widely distributed throughout the vegetation associations.
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	Yes	VA10, VA24	Widely distributed throughout VA10 at BAM site AB10 and VA24 at BAM site AB24b.
<i>Rumex dumosus</i>	Wiry Dock		R	Yes	VA24	A single plant recorded at BAM site AB24b
<i>Rytidosperma tenuior</i>	Short-awn Wallaby-grass		R	No	VA2, VA8	Widespread throughout the central Project Area. Recorded in 2008, but not recorded again by subsequent surveys.

EPBC Act: Ex = Extinct; CR = Critically endangered; EN = Endangered; VU = Vulnerable.

NPW Act: E= Endangered; V = Vulnerable; R= Rare.

**Table 18. Likelihood of occurrence of threatened flora identified in the desktop assessment. The data source and threat levels are described in the table footer.**

Scientific Name	Common Name	EPBC Act	NPW Act	Sighting Date	Data Source	Habitat	Likelihood
<i>Acacia glandulicarpa</i>	Hairy-pod Wattle	VU	E	2008	1, 2	Semi-arid environments with a mean annual rainfall of 400–500 mm, with many records at sites coinciding with gentle slopes at the transition zone between heavy clay/gravel soils on the flats and sandy soils on the rises. Main population in western Victoria/SA border. The other SA sub-population located in the in the Booborowie-Burra Gorge-Hanson-Farrell Flat area (DSEWPC, 2014). It grows in alkaline soil on rocky hills in open scrub (at Burra), or in eucalypt open forest.	Possible
<i>Acacia spilleriana</i>	Spiller's Wattle	EN	E	2021	1, 2, 4, 5	Fragmented populations occurring in the northern Mount Lofty Ranges and in the ranges around Burra and Auburn. Most populations are on road verges, except for larger populations that occur in the Burra Gorge/Hallelujah Hills area. Grows on rocky hills, commonly along watercourses and roadsides. Associated with species such as <i>Acacia calamifolia</i> (Wallowa) and communities dominated by <i>Eucalyptus gracilis</i> (Yorrell), <i>E. socialis</i> (Beaked Red Mallee) and <i>E. brachycalyx</i> (Gilja) open scrub with a shrubby understorey and <i>E. camaldulensis</i> (River Red Gum) woodland.	Possible
<i>Asperula syrticola</i>	Southern Flinders Woodruff		R	2005	1	SA: FR EP NL MU. Grows under mallee and Eucalyptus woodlands. Also recorded from <i>Acacia pycnantha</i> Very Low Open Woodland over <i>Triodia</i> sp. Sometimes associated with limestone ridges.	Possible
<i>Austrostipa breviglumis</i>	Cane Spear-grass		R	2008	1	In SA occurs in FR, EP, NL and SL regions. Also from Vic. Habitat is rocky gullies to ridge tops, often in seasonally wet areas dominated by woodlands with <i>Eucalyptus odorata</i> , <i>Xanthorrhoea quadrangulata</i> , <i>Bursaria spinosa</i> and <i>Callitris glaucophylla</i> .	Possible
<i>Austrostipa densiflora</i>	Fox-tail Spear-grass		R	1994	1	SA: FR, EA, MU, SL, KI. Also from Qld, NSW and Vic. Occurs in a range of soils, especially sandy, but also rich soils associated with rocky places, including limestone. Has been recorded from disturbed places in woodlands and grasslands.	Possible
<i>Austrostipa multispiculis</i>	Many-flowered Spear-grass		R	1995	1	SA: NL MU SL KI. Grows in open grassland with <i>Austrostipa nodosa</i> , <i>A. eremophila</i> and <i>Rhytidosperra setaceum</i> and <i>Aristida</i> sp.	Likely
<i>Austrostipa petraea</i>	Flinders Range Spear-grass		R	1993	1	In SA, occurs in FR, EA, EP and NL regions. It has been recorded from rich soils but mainly in rocky places including limestone.	Likely
<i>Bothriochloa macra</i>	Red-leg Grass		R	2000	1	SA: FR EA EP NL MU YP SL SE. Eastern States of Australia. Grows on a variety of soil types in humid areas but in drier areas is restricted to run-on areas on clay or loamy soils. Occurs on most soil types but often dominant on poor, lower fertility soils and frequently invades degraded areas. Scattered recent records within southern EP. Mainly found in open grassy woodland communities and is often found in disturbed sites.	Possible



Scientific Name	Common Name	EPBC Act	NPW Act	Sighting Date	Data Source	Habitat	Likelihood
<i>Caladenia tensa</i>	Inland Green-comb Spider-orchid	EN		2007	1, 2	Various habitats have been described including Cypress Pine / Yellow Gum Woodland, Pine / Box woodland, mallee-heath sites, healthy woodland and mallee woodland, generally with rock outcrops. Flowering in spring (September - October).	Possible
<i>Codonocarpus pyramidalis</i>	Slender Bell-fruit	VU	E	2013	1, 2	Occurs as scattered individuals across areas of the Flinders Ranges, Northern Lofty Ranges and the eastern regions of SA such as within the Murray Darling Basin, Eyre Peninsula, Yorke and Adelaide. Grows along the crests of hills and ridges, slopes and along creeks, where the soil is either a loamy sand or sandy clay loam and where the pH is between 8.5–9. Throughout its range it is never common and only scattered trees are to be found.	Possible
<i>Cryptandra campanulata</i>	Long-flower Cryptandra		R	2019	1	Occurs in the FR, EA, NL and MU regions of SA. This species grows in shallow soils over rocks such as quartzite, granite, sandstone, limestone or shale, in the southern Flinders Ranges and northern Mt Lofty Ranges. <i>Cryptandra campanulata</i> is the most frequently encountered woody species in iron-grass grasslands (Turner 2012); it also occurs in heath and shrubland vegetation.	Known
<i>Daviesia schwarzenegger</i>	Mallee Bitter-pea		R*	2005	1	Found in the southern Flinders Ranges and the Mid-north in South Australia, growing in drier sites dominated by mallee eucalyptus on clay soils. Also found in New South Wales and Victoria	Possible
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	2013	1	Records mainly from the ranges. Occurs under a variety of overstorey <i>Eucalyptus</i> species but is a grassy woodland specialist, e.g., Blue Gum, Candlebark, Manna Gum, Stringybark and Grey Box.	Possible
<i>Diuris behrii</i>	Behr's Cowslip Orchid		V	2013	1	Mostly in native grassland, open woodland and grassy forest clearings in more fertile soils, especially amongst kangaroo grass and <i>Triodia</i> on gentle slopes and flats.	Possible
<i>Dodonaea procumbens</i>	Trailing Hop-bush	VU	V	2018	1, 3	In SA the species occurs near Port Lincoln, near Clare and Burra in the northern Mt Lofty Ranges, on Kangaroo Island and near Penola in the SE. <i>Dodonaea procumbens</i> grows in low-lying, often winter-wet areas in woodland, low open forests, heathland and grasslands, on sands and clay. Recorded in open <i>Eucalyptus camaldulensis</i> , <i>E. fasciculosa</i> and <i>E. leucoxyton</i> woodlands in low-lying areas, and in <i>Lepidosperma viscidum</i> , <i>Themeda triandra</i> , <i>Rhytidosperra spp.</i> , <i>Austrostipa spp.</i> native grasslands.	Known

Scientific Name	Common Name	EPBC Act	NPW Act	Sighting Date	Data Source	Habitat	Likelihood
<i>Dodonaea subglandulifera</i>	Peep Hill Hop-bush	EN	E	2012	1, 2	Populations primarily occur on low hills on loamy soils associated with rocky (limestone, slate, shale) outcrops. The species has also been recorded from plains country in sandy soils over limestone.	Likely
<i>Echinopogon ovatus</i>	Rough-beard Grass		R	2008	1	Grows in the shade.	Likely
<i>Elatine gratioloides</i>	Waterwort		R	2005	1	Aquatic annual found growing in or on the margins of stationary or slow-flowing water to 40 cm deep.	Unlikely.
<i>Eryngium ovinum</i>	Blue Devil		V	2019	1, 4	Widespread, chiefly in inland districts. Grows in damp clayey or sandy soils of open woodland and disturbed roadside sites and pastures.	Known
<i>Festuca benthamiana</i>	Bentham's Fescue		R	1988	1	Dryish upland sites.	Possible
<i>Logania saxatilis</i>	Rock Logania		R	2008	1	Steep-sided sandstone gorges in open woodland and in crevices in rocky outcrops.	Possible
<i>Maireana excavata</i>	Bottle Fissure-plant		V	2019	1	Occurs in native grasslands of the arid regions in shallow soils.	Highly likely
<i>Maireana rohrlachii</i>	Rohrlach's Bluebush		R	2014	1, 3, 4	Species occurs from few locations on EP, but mainly YP, Mid North, Fleurieu Peninsula, Murray lands and western Victoria. Preferred habitat includes heavy clay and calcareous loams with <i>Geijera linearifolia</i> (Sheep Bush) Very Open Shrubland, <i>Eremophila scoparia</i> (Silvery Emubush) low open shrubland. In Victoria it is found on saline or sandy loam soils rich in gypsum, often fringing lakes and in seasonally wet areas.	Known in VA2 and VA8.
<i>Mentha satureioides</i>	Native Pennyroyal		R	2001	1	Grows in sandy-clay to clay-rich soils, frequently in grassy areas and in open woodland communities.	Known in VA8.
<i>Olearia pannosa ssp. pannosa</i>	Silver Daisy-bush	VU	V	2003	1	Endemic to SA where it is scattered throughout agricultural areas. Collections have been made in the EP, YP, FR, Southern MLR, Northern MLR, Murray Basin and SE botanical districts and a single collection from KI. Is generally found in sandy, flat areas and in hilly, rocky areas in woodland or mallee communities dominated by a wide range of <i>Eucalypt</i> , <i>Melaleuca</i> and <i>Callitris</i> species.	Possible
<i>Philothea verrucosa</i>	Bendigo Wax-flower		V	2009	1	SA: NL. Occurs naturally on poor stony ground and on dry hills.	Known
<i>Podolepis jaceoides</i>	Showy Copper-wire Daisy		R	1981	1	Occurs in grassland, woodland and mallee, typically on soils of higher nutrient status.	Possible.

Scientific Name	Common Name	EPBC Act	NPW Act	Sighting Date	Data Source	Habitat	Likelihood
<i>Podolepis muelleri</i>	Button Podolepis		V	1992	1	Occurs on coastal cliffs and on stony sites further inland.	Possible.
<i>Ptilotus erubescens</i>	Hairy-tails		R	2019	1	SA: FR NL MU SL SE. Grassy Woodlands, scrublands.	Known
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	2009	1	Endemic to the Northern Mount Lofty Ranges in SA. It is confined to a narrow range of habitats on the upper rocky slopes of Tothill Range and one small outlying hill.	Known
<i>Rumex dumosus</i>	Wiry Dock		R	2019	1, 4, 5	Grows in damp areas associated with mallee.	Known
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass		R	2003	1	Ecologically variable, from alpine moorland to open grassland or light woodland, often in seasonally damp habitats.	Likely
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass		R	2013	1, 6	Grows in altitudes between 5–750 m, on Tablelands usually in somewhat damp habitats, rarely dominant; along the coastal shelf a very common constituent of disturbed road verges.	Known
<i>Sclerolaena muricata</i> var. <i>villosa</i>	Five-spine Bindyi		R	2003	1	Usually on heavier soils. Often in disturbed areas.	Likely
<i>Senecio megaglossus</i>	Large-flower Groundsel	VU	E	1993	1, 2	Endemic to SA where it is Confined to the Northern Mt Lofty Ranges and Southern Flinders Ranges of SA. Found in rocky creek banks and rocky gorge/valley slopes but also in sandhills. Associated with herb lands or grassland with <i>Lomandra effusa</i> , <i>Triodia irritans</i> or <i>Austrostipa</i> sp.; tall open-shrubland with <i>Pittosporum angustifolium</i> , <i>Alectryon oleifolius</i> , <i>Cassinia laevis</i> , <i>Eremophila longifolia</i> , <i>Acacia calamifolia</i> and <i>Bursaria spinosa</i> and <i>Triodia irritans</i> and <i>Callitris gracilis</i> and <i>Eucalyptus camaldulensis</i> woodlands.	Possible
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R	2008	1	In SA, the species prefers <i>Eucalyptus</i> woodlands, <i>Lomandra effusa</i> Open Grasslands, <i>Dodonaea lobulata</i> shrublands and Bluebush shrublands.	Likely

EPBC Act: Ex = Extinct; CR = Critically Endangered; EN = Endangered; VU = Vulnerable.

NPW Act: E = Endangered; V = Vulnerable; R = Rare.

Source: 1 = BDBSA; 2 = Protected Matters Search Tool; 3 = EBS Ecology 2020; 4 = EBS Ecology 2021b; 5 = This survey; 6 = EBS Ecology 2008a.

### 4.3. Cumulative impacts

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must consider the potential cumulative impact, both direct and indirect, that is reasonably likely to result from a proposed clearance activity.

#### Direct clearance

To calculate the impact to native vegetation, all infrastructure associated with **GWF 1 Stage 1A**, including WTG sites, access tracks, cable routes and a construction compound has been mapped in Arc GIS and overlaid onto native vegetation association information. This includes all associated infrastructure and construction areas, such as turbine site hardstands, crane hardstands, stockpiles, batter slopes and construction compounds/laydown areas, which will require clearance of native vegetation.

A 5 m buffer has been applied to the outer extent of access tracks and hardstands to allow for construction access and stockpiling.

To calculate the amount of native vegetation clearance required for underground cables an impact width of 12 m along all cable routes has been used, which is considered to be a conservative figure as cable impact widths will vary from 6 – 12 m, depending on the number of cables within each cable run.

#### Indirect clearance

Construction and operation of the Goyder South Project has the potential to cause indirect impacts to native vegetation associated with construction machinery, dust, weeds, herbicide use, altered hydrology/stormwater drainage and potentially changes to local grazing regimes/levels. However, the construction contractor and wind farm operator will be required to implement a Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (respectively) to identify and document potential impacts to flora and fauna (and the environment in general) as well as the management measures that will be implemented to avoid, minimise, manage and mitigate these potential indirect impacts. In particular, as part of the CEMP, a *Flora and Fauna Management Plan* will be implemented to specifically address (avoid/minimise/manage/mitigate) potential impacts to flora and fauna.

#### Other stages

A summary of the native vegetation clearance associated with each Stage of the Goyder South Project is presented in Table 19.

**Table 19. Cumulative Clearance Summary for the Goyder South Project.**

Stage / Clearance Application	Area of Impact (ha)	Total Biodiversity Score	SEB Points Required	SEB Area Required (ha)	SEB Payment (\$)	Admin Fee (\$)
<b>GWF 1 Stage 1A</b>	132.99	2567.74	2696.12	337.02	\$1,141,532.63	\$62,784.33
GWF 1 Stage 1B	202.41	4391.08	4610.64	576.32	\$1,952,138.42	\$107,367.61
Overhead Transmission Line and Substation	116.60	3530.15	3429.32	428.67	\$1,451,967.68	\$79,858.72
Battery	0	0	0	0	0	0
<b>Totals</b>	<b>452</b>	<b>10488.97</b>	<b>10736.08</b>	<b>1342.01</b>	<b>\$4,545,638.73</b>	<b>\$250,010.66</b>

Refer to the individual native vegetation clearance assessment reports for **GWF 1 Stage 1B** and the **Overhead Transmission Line and Substation** for more detail on the proposed clearance associated with those stages of the Goyder South Project.

## 4.4. Addressing the Mitigation Hierarchy

*When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will also consider, with the aim to minimize, impacts on biological diversity, soil, water and other natural resources, threatened species or ecological communities under the EPBC Act or listed species under the NP&W Act.*

### **a) Avoidance – outline measures taken to avoid clearance of native vegetation**

All stages of the project design have been undertaken considering vegetation mapping, threatened ecological community mapping and the known locations of threatened species populations. Whilst every effort has been made to avoid sensitive areas where possible, such as locating turbines outside of *Lomandra* spp. Grasslands, engineering and landscape constraints mean that clearing of native vegetation cannot be completely avoided.

### **b) Minimisation – if clearance cannot be avoided, outline measures taken to minimize the extent, duration and intensity of impacts of the clearance on biodiversity to the fullest possible extent (whether the impact is direct, indirect or cumulative).**

As far as is practicable, the development has been placed in areas with no native vegetation or avoided native vegetation in better condition or of higher conservation value. This has included the following:

- Threatened Ecological Community *Iron-grass Natural Temperate Grassland of South Australia* in good condition has been avoided.
- The Threatened Ecological Community *Peppermint Box (Eucalyptus odorata) Grassy Woodland of South Australia* has been avoided.
- Impact to woodland vegetation has been limited to disturbed edges of patches, avoiding further fragmentation.
- No scattered trees will be cleared.
- Existing access tracks will be utilised wherever possible.

Where native vegetation cannot be avoided, NEOEN will minimise impact to flora and fauna, including threatened species, and avoid over clearing by implementing their *Construction Environmental Management Plan (CEMP)*. The CEMP details the management strategies that will be implemented to minimise impact to a number of environmental receptors, and includes the following sub-management plans:

1. Flora and Fauna and Rehabilitation.
2. Weed, Pest and Disease Control
3. Water Quality Protection.
4. Soil Management, Erosion and Sediment Control.
5. Construction Noise and Vibration.
6. Air Quality Control

7. Materials, Fuels and Waste Management.
8. Protection of Sites of Cultural and Natural Heritage Significance
9. Temporary Concrete Batch Plants.

The CEMP is provided as Attachment 4 (Att3 DA Package Appendix Vol 1).

The CEMP includes provision for the development of a *Flora and Fauna Management Plan*. This plan will address site-specific management actions such as the following:

- Maintaining 1km buffers and other management actions to protect active Wedge-tailed Eagle nests.
- Micro siting of infrastructure in sensitive areas such as Pygmy Blue-tongue Lizard habitat or near threatened plant populations.
- Future on-going flora and fauna monitoring programmes.

The Flora and Fauna Management Plan is in development and will be provided on completion.

The Project has been referred under the EPBC Act for the following matters of national environmental significance:

- Threatened species – Pygmy Blue-tongue Lizard, *Dodonaea procumbens*, *Dodonaea subglandulifera*, *Acacia spilleriana* and *Olearia pannosa* ssp. *pannosa*.
- Threatened Ecological Communities – *Iron-grass Natural Temperate Grassland of South Australia* and *Peppermint Box (Eucalyptus odorata) Grassy Woodland of South Australia*.

It is expected that the Commonwealth Department of Agriculture, Water and the Environment will require further impact minimisation measures beyond the above. Once known, this information can be provided if required.

- c) *Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.***

The Project includes areas of both temporary and permanent clearance. Temporary clearance areas will be rehabilitated according to the strategies discussed in the CEMP (Attachment 4).

- d) *Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.***

*The NVC will only consider an offset once avoidance, minimization and restoration have been documented and fulfilled. The SEB Policy explains the biodiversity offsetting principles that must be met.*

NEOEN plans to offset the Project by providing an on-ground SEB. This is further discussed in Section 6.

## 4.5. Principles of Clearance (Schedule 1, Native Vegetation Act 1991)

The Native Vegetation Council will consider Principles 1(b), 1(c) and 1(d) when assigning a level of Risk under Regulation 16 of the Native Vegetation Regulations. The Native Vegetation Council will consider all the Principles of clearance of the Act as relevant, when considering an application referred under the Planning, Development and Infrastructure Act 2016.

Assessment of the Project against the Principles of Clearance is shown in Table 20. The Project is seriously at variance with Principles 1(b), 1(d) and 1(e) and at variance with Principle 1(a) and 1(c).

**Table 20. Assessment against the Principles of Clearance.**

Principle of clearance	Considerations
<b>Principle 1(a)</b> – it comprises a high level of diversity of plant species	<p><b><u>Relevant information</u></b></p> <p><u>Number of plant species recorded</u></p> <p>VA2: 23 (12 native, 11 introduced)                      VA6: 12 (6 native, 6 introduced)                      VA8: 53 (26 native, 27 exotic)                      VA10: 22 (17 native, 5 introduced)                      VA24: 47 (34 native, 13 introduced)</p> <p><u>Bushland Plant Diversity Score</u></p> <p>AA2: 10.0                      AA8: 8.0                      AB2: 4.0                      AB6: 8.0                      AB8: 12.00                      AB10: 14                      AB24: 19</p>
	<p><b><u>Assessment against the principles</u></b></p> <p><u>Seriously at Variance</u></p> <p>No Vegetation Associations</p> <p><u>At Variance</u></p> <p>AA2                      AB8                      AB10                      AB24</p>
	<p><b><u>Moderating factors that may be considered by the NVC</u></b></p> <p>Where only a very small area of vegetation will be impacted relative to the amount of vegetation within the local vicinity (less than 0.25% of the native vegetation within a 5 km radius to be impacted) it may reduce the impact from ‘at variance’ to ‘not at variance’.</p> <p>The total area of each VA in the Stage 1A Project Area compared to impact is shown in Table 10.</p>

**Relevant information**

The following threatened species have been recorded or may use the vegetation under application:

- Pygmy Blue-tongue Lizard - Known
- Flinders Ranges worm Lizard - Likely
- Fork-tailed Swift - Possible
- Australian Bustard - Possible
- Brown Quail – Highly Likely
- Peregrine Falcon - Known
- Blue-winged Parrot - Possible
- Elegant Parrot – Known
- White-winged Chough – Known
- Little Eagle – Likely
- Hooded Robin – Known
- Black-chinned Honeyeater – Possible
- Jacky Winter – Likely
- Satin Flycatcher – Known
- Restless Flycatcher – Known
- Scarlet Robin – Possible
- Striped Honeyeater – Possible
- Diamond Firetail – Known
- Common Brushtail Possum – Possible
- Painted Button-quail - Possible

Generally, however, the extensive grasslands have a low diversity of fauna and patches of woodland are highly fragmented, usually small in extent, with mainly common species recorded during the survey.

Woodland trees provide hollows and shelter refuge for common species such as kangaroos and birds and extensive rock outcrops occur on ridgetops that are also important habitat in an otherwise cleared landscape.

Un-ploughed grasslands in the Stage 1A Project Area are known to be essential habitat for the Pygmy Bluetongue Lizard and the species has been recorded there during a number of previous fauna surveys.

Threatened Fauna Score (TFS)

AA2: 0.1  
AA8: 0.1  
AB2: 0.1  
AB6: 0.1  
AB8: 0.1  
AB10: 0.1  
AB24: 0.1

Unit biodiversity Score (UBS)

AA2: 31.16  
AA8: 15.43  
AB2: 14.97  
AB6: 27.72  
AB8: 21.33  
AB10: 44.54  
AB24: 59.68

**Principle 1(b)  
– significance  
as a habitat  
for wildlife**



	<p><b><u>Assessment against the principles</u></b></p> <p><u>Seriously at Variance</u></p> <p>AB24 (UBS &gt;50)</p> <p><u>At Variance</u></p> <p>AA2 AA8 AB2 AB6 AB8 AB10</p> <p>(TFS &gt;0 AND &lt;0.5)</p> <p><b><u>Moderating factors that may be considered by the NVC</u></b></p> <p><u>Impact Significance</u></p> <p>The following criteria are used to determine whether an action will have a significant impact on listed threatened fauna species and therefore clearance will be raised to ‘Seriously at variance’. A clearance action will have or is likely to have a significant impact on a threatened species if it may:</p> <ul style="list-style-type: none"> <li>• lead to a long-term decrease in the size of a population, or</li> <li>• reduce the area of occupancy of the species, or</li> <li>• fragment an existing population into two or more populations, or</li> <li>• adversely affect habitat critical to the survival of a species, or</li> <li>• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or</li> <li>• result in invasive species that are harmful to a threatened species becoming established in the threatened species habitat, or</li> <li>• interfere with the recovery of the species.</li> </ul> <p>If the NVC are of the opinion that the clearance will not have a significant impact on fauna habitat, the clearance may be reduced to At variance.</p> <p><u>Significant benefit</u></p> <p>If the SEB provides a benefit to the threatened species that is well over and above what is required in the SEB Policy and Guide, it may be reduced to ‘At variance’.</p> <p><u>Common species</u></p> <p>If the vegetation provides habitat for native species that are relatively common, and the area of clearance is not considered essential habitat to maintain the local population, it may be reduced to ‘At variance’.</p> <p><u>Non-essential habitat</u></p> <p>If the clearance is of non-essential habitat for threatened species and the clearance will have a negligible impact on that species local population over the long term (i.e., next 20 to 50 years), it may be reduced to ‘At variance’.</p>
<p><b>Principle 1(c) – plants of a rare, vulnerable or endangered species</b></p>	<p><b><u>Relevant information</u></b></p> <p>The following threatened plant species have been recorded in the impacted areas of the Stage 1A Project Area:</p> <ul style="list-style-type: none"> <li>• <i>Eryngium ovinum</i> – uncommon, but found throughout AA2, AA8.</li> <li>• <i>Cryptandra campanulata</i> – Widespread throughout AB24 and uncommon in AA8 and AB8.</li> <li>• <i>Philothea verrucosa</i> – Spread throughout AB10, but uncommon.</li> <li>• <i>Pultenaea kraehenbuehlii</i> – Widespread throughout AB10 and AB24.</li> </ul>

- *Rumex dumosa* – a single plant located in AB24, but outside the impact area.

Although *Dodonaea procumbens* and *Acacia spilleriana* have been recorded in the Stage 1A Project Area, they are not impacted by the project.

Threatened Flora Score (TFLS)

AA2: 0.0  
 AA8: 0.08  
 AB2: 0.0  
 AB6: 0.0  
 AB8: 0.04  
 AB10: 0.08  
 AB24: 0.08

**Assessment against the principles**

Seriously at Variance

No Vegetation Associations

At Variance

AA8  
 AB8  
 AB10  
 AB24

(TFLS >0 and <0.1)

**Moderating factors that may be considered by the NVC**

Impact Significance

The following criteria are used to determine whether an action will have a significant impact on listed threatened fauna species and therefore clearance will be raised to 'Seriously at variance'. A clearance action will have or is likely to have a significant impact on a threatened species if it may:

- lead to a long-term decrease in the size of a population, or
- reduce the area of occupancy of the species, or
- fragment an existing population into two or more populations, or
- adversely affect habitat critical to the survival of a species, or
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or
- result in invasive species that are harmful to a threatened species becoming established in the threatened species habitat, or
- interfere with the recovery of the species.

If the NVC are of the opinion that the clearance will not have a significant impact on fauna habitat, the clearance may be reduced to At variance.

Number of plants to be cleared

If less than 1% of the individual plants are affected within the immediate vicinity (within a 1 km radius) of the proposed clearance, or the affected individuals can be transplanted or replaced easily, the proposed clearance may be tempered to 'At variance'.

Significant benefit

If the SEB provides a benefit to the threatened species that is well over and above what is required as detailed in the related SEB Policy and Guide, it may be reduced to 'At variance'.

<b>Principle 1(d) – the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered</b>	<p><b><u>Relevant information</u></b></p> <p>VA2 (AA2 and AB2) – Iron-grass Natural Temperate Grasslands of South Australia (EPBC Act Endangered)</p> <p>VA24 (AB24) – <i>Allocasuarina verticillata</i> Grassy Low Woodland on clay loam soils of low hills (Provisional List Vulnerable)</p> <p>Threatened Community Score</p> <p>AA2: 1.4 AA8: 1.0 AB2: 1.4 AB6: 1.0 AB8: 1.0 AB10: 1.0 AB24: 1.2</p>
	<p><b><u>Assessment against the principles</u></b></p> <p><u>Seriously at Variance</u></p> <p>AA2 AB2 AB24</p>
	<p><b><u>Moderating factors that may be considered by the NVC</u></b></p> <p><u>Impact Significance</u></p> <p>The following criteria are used to determine whether a clearance proposal will have a significant impact on a listed threatened plant community and therefore clearance will be raised to 'Seriously at variance' with this principle. An action has, will have, or is likely to have a significant impact on a threatened plant community if it does, will, or is likely to:</p> <ul style="list-style-type: none"> <li>• lead to a long-term adverse effect on a plant community, or</li> <li>• reduce the extent of a community, or</li> <li>• fragment an occurrence of the community, or</li> <li>• adversely affect habitat critical to the survival of a plant community, or</li> <li>• modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the community's survival, or</li> <li>• result in invasive species that are harmful to the threatened plant community becoming established in an occurrence of the community, or</li> <li>• interfere with the recovery of a plant community.</li> </ul> <p><u>Area of impact</u></p> <p>If less than 1% of the area of that vegetation community within the immediate vicinity (within a 1km radius) of proposed clearance is to be affect, the proposed clearance may be tempered to 'At variance'.</p> <p>The total area of each VA in the Stage 1A Project Area compared to impact is shown in Table 10</p> <p><u>Condition of the vegetation</u></p> <p>If the vegetation is in a highly degraded state and is unlikely to return to a functional state without significant human intervention, the proposed clearance may be tempered to 'At variance'.</p>

<b>Principle 1(e)</b> <b>– it is significant as a remnant of vegetation in an area which has been extensively cleared</b>	<b><u>Relevant information</u></b>				
	<b>IBRA Subregion</b>	<b>Remnancy</b>	<b>IBRA Association</b>	<b>Remnancy</b>	<b>BAM Sites</b>
	Broughton	10	Hansen	3	AA2, AA8
			Burra Hills	45	AB2, AB8, AB6, AB10, AB24
<p>Remnant grasslands in the Stage 1A Project Area are generally in poor condition, particularly in Block AA (Hansen IBRA). Woodland in Block AA exists in small, highly fragmented patches that are heavily impacted by weeds and grazing activity.</p> <p>Woodlands in Block AB (Burra Hills IBRA) are often part of more extensive remnant patches that extend beyond the boundary of the Stage 1A Project Area. They are generally in a better condition, with less weeds and a higher diversity of native plant species. Although they remain heavily grazed.</p> <p><u>Total Biodiversity Score</u></p> <p>AA2: 119.46  AA8: 867.50  AB2: 108.16  AB6: 118.91  AB8: 1273.09  AB10: 67.62  AB24: 13.01</p>					
<b><u>Assessment against the principles</u></b>					
<p><u>Seriously at Variance</u></p> <p>AA2  AA8  AB2  AB6  AB8  AB10  AB24</p>					
<b><u>Moderating factors that may be considered by the NVC</u></b>					
<p><u>Impact significance</u></p> <p>The following criteria are used to determine whether a clearance proposal will have a significant impact on a remnant in a highly landscape and therefore clearance will be raised to 'Seriously at variance' with this principle. An action has, will have, or is likely to have a significant impact on a remnant in a highly cleared landscape if it does, will, or is likely to:</p> <ul style="list-style-type: none"> <li>• impact on a tree species or vegetation community that has been selectively removed within the IBRA Association or IBRA Subregion and are therefore underrepresented in the vegetation that remains.</li> <li>• Impact on a remnant in relatively good condition, particularly if the vegetation within the IBRA Association or IBRA Subregion where vegetation has largely been degraded.</li> </ul> <p><u>Quality of remnant</u></p> <p>If the vegetation is in poor to very poor condition, is continuing to degrade and its long term (next 20 to 50 years) persistence is unlikely, then it may be reduced to 'At variance'.</p>					

<b>Principle 1(f) – it is growing in, or in association with, a wetland environment</b>	<b><u>Relevant information</u></b> No impacted vegetation Association is growing in association with a wetland environment.
	<b><u>Assessment against the principles</u></b>  <u>Seriously at Variance</u> - None  <u>At Variance</u> - None
<b>Principle 1(g) – it contributes significantly to the amenity of the area in which it is growing or is situated</b>	<b><u>Relevant information</u></b>  All vegetation is situated on private property. In a few areas, grassland and shrubland vegetation occurs alongside public roads, while woodland is restricted to remote areas on properties. These woodland areas, although some distance from any areas frequented by the public, are often situated on hillsides and ridge tops that are visible from the area’s public road network.  The wind farm development will be become a highly visible component of the landscape once complete, although remote from any areas accessible to the general public.
	<b><u>Moderating factors that may be considered by the NVC</u></b>
	In determining if the clearance is at variance with the principle, the NVC will have regard to the local Council’s recommendations (if any) in relation to the application.

*Principles of Clearance (h-m) will be considered by comments provided by the local NRM Board or relevant Minister. The Data Report should contain information on these principles where relevant and where sufficient information or expertise is available.*

## 4.6. Risk assessment

The level of risk associated with the application

Table 21. Summary of the level of risk associated with the application.

<b>Total clearance</b>	No. of trees	0
	Area (ha)	132.99
	Total biodiversity Score	2567.74
<b>Seriously at variance with principle 1(b), 1(c) or 1 (d)</b>	1(b), 1(d) and 1(e)	
<b>Risk assessment outcome</b>	Level 4	

# 5. Clearance summary

A clearance summary for the **GWF 1 Stage 1A** is presented in Table 22, with the SEB totals summarised in Table 23. Refer to Section 4.3 for a summary of clearance associated with the other stages of the Goyder South Project and the individual Native Vegetation Clearance Data Reports for clearance associated with the other stages.

Table 22. Clearance summary table.

Vegetation Association	Block	BAM Site	Impact Area (ha)	Species Diversity Score	TEC Score	Threatened Plant Score	Threatened Fauna Score	Vegetation Condition Score	Unit Biodiversity Score	Total Biodiversity Score	SEB Pts	Ha Required	SEB	Admin. Fee	Total
2	AA	AA2a	3.83	10.00	1.40	0.00	0.10	17.03	31.16	119.46	125.43	15.68	\$ 53,106.20	\$ 2,920.84	\$ 56,027.04
8	AA	AA8a	56.22	6.00	1.00	0.00	0.10	6.77	9.09	511	536.55	67.07	\$ 227,174.71	\$ 12,494.61	\$ 239,669.32
	AA	AA8c	56.22	8.00	1.00	0.00	0.10	14.45	19.39	1090.13	1144.64	143.08	\$ 484,639.39	\$ 26,655.39	\$ 511,294.78
	AA	AA8e	56.22	10.00	1.00	0.00	0.10	11.96	16.06	902.77	947.9	118.49	\$ 401,341.99	\$ 22,073.81	\$ 423,415.80
	AA	AA8f	56.22	4.00	1.00	0.00	0.10	2.13	2.86	160.6	168.63	21.08	\$ 71,397.77	\$ 3,926.88	\$ 75,324.65
	AA	AA8g	56.22	8.00	1.00	0.00	0.10	3.39	4.54	255.5	268.27	33.53	\$ 113,587.36	\$ 6,247.30	\$ 119,834.66
	AA	AA8h	56.22	8.00	1.00	0.00	0.10	3.55	4.76	267.67	281.05	35.13	\$ 118,996.28	\$ 6,544.80	\$ 125,541.08
	AA	AA8i	56.22	8.00	1.00	0.00	0.10	16.13	21.64	1216.67	1277.5	159.69	\$ 540,892.17	\$ 29,749.07	\$ 570,641.24
	AA	AA8j	56.22	14.00	1.00	0.08	0.10	26.41	38.02	2137.84	2244.73	280.59	\$ 950,416.39	\$ 52,272.90	\$ 1,002,689.29
		AA8 MEAN	56.22	8.00	1.00	0.01	0.10	11.28	15.43	867.50	910.87	113.86	\$ 385,663.77	\$ 21,211.53	\$ 406,875.30
<b>AA Total</b>			<b>60.06</b>						<b>46.59</b>	<b>986.96</b>	<b>1036.30</b>	<b>129.54</b>	<b>\$ 438,769.97</b>	<b>\$ 24,132.37</b>	<b>\$ 462,902.34</b>
2	AB	AB2b	7.23	4.00	1.40	0.00	0.10	8.39	27.72	108.16	113.56	14.2	\$ 48,082.44	\$ 2,644.53	\$ 50,726.97
6	AB	AB6	4.64	8.00	1.00	0.00	0.10	21.18	31.28	118.91	124.86	15.61	\$ 52,863.93	\$ 2,907.52	\$ 55,771.45
8	AB	AB8a	61.11	12.00	1.00	0.04	0.10	23.06	31.28	1866.88	1960.22	245.03	\$ 829,956.85	\$ 45,647.63	\$ 875,604.48
	AB	AB8b	61.11	12.00	1.00	0.00	0.10	11.9	15.58	929.66	976.14	122.02	\$ 413,298.35	\$ 22,731.41	\$ 436,029.76
	AB	AB8c	61.11	12.00	1.00	0.00	0.10	16.25	21.28	1269.78	1333.27	166.66	\$ 564,505.07	\$ 31,047.78	\$ 595,552.85
	AB	AB8d	61.11	16.00	1.00	0.04	0.10	9.78	13.26	791.4	830.97	103.87	\$ 351,832.96	\$ 19,350.81	\$ 371,183.77
	AB	AB8e	61.11	10.00	1.00	0.00	0.10	17.42	22.8	1360.48	1428.5	178.56	\$ 604,826.00	\$ 33,265.48	\$ 638,091.48
	AB	AB8f	61.11	10.00	1.00	0.00	0.10	18.18	23.8	1420.32	1491.33	186.42	\$ 631,428.04	\$ 34,728.54	\$ 666,156.58
		AB8 Mean	61.11	12.00	1.00	0.01	0.10	16.10	21.33	1273.09	1336.74	167.09	\$ 565,974.55	\$ 31,128.61	\$ 597,103.15
10	AB	AB10	1.52	14.00	1.00	0.08	0.10	31.72	44.54	67.62	71	8.87	\$ 30,060.11	\$ 1,653.31	\$ 31,713.42
24	AB	AB24a	0.22	20.00	1.20	0.04	0.10	43.48	69.33	15.11	15.86	1.98	\$ 6,715.98	\$ 369.38	\$ 7,085.36
	AB	AB24b	0.22	18.00	1.20	0.08	0.10	30.47	50.04	10.9	11.45	1.43	\$ 4,847.29	\$ 266.60	\$ 5,113.89

Vegetation Association	Block	BAM Site	Impact Area (ha)	Species Diversity Score	TEC Score	Threatened Plant Score	Threatened Fauna Score	Vegetation Condition Score	Unit Biodiversity Score	Total Biodiversity Score	SEB Pts	Ha Required	SEB	Admin. Fee	Total
		AB24 Mean	0.22	19.00	1.20	0.06	0.10	36.975	59.685	13.005	13.655	1.705	\$ 5781.635	\$ 317.99	\$ 6,099.63
		<b>AB Total</b>	<b>74.71</b>						<b>168.25</b>	<b>1580.78</b>	<b>1659.81</b>	<b>207.48</b>	<b>\$ 702,762.66</b>	<b>\$ 38,651.96</b>	<b>\$ 741,414.62</b>
<b>STAGE 1A TOTAL</b>			<b>134.77</b>						<b>214.84</b>	<b>2567.74</b>	<b>2696.12</b>	<b>337.02</b>	<b>\$ 1,141,532.63</b>	<b>\$ 62,784.33</b>	<b>\$ 1,204,316.96</b>



Table 23. Totals summary table.

	Total Biodiversity score	Total SEB points required	Hectares Required for On-ground	SEB Payment	Admin Fee	Total Payment
Application	2567.74	2696.12	337.02	\$1,141,532.63	\$62,784.33	\$1,204,316.96

Economies of Scale Factor	0.5
Rainfall (mm)	321

# 6. Significant Environmental Benefit

A Significant Environmental Benefit (SEB) is required for approval to clear under Division 5 of the *Native Vegetation Regulations 2017*. The NVC must be satisfied that as a result of the loss of vegetation from the clearance that an SEB will result in a positive impact on the environment that is over and above the negative impact of the clearance.

## ACHIEVING AN SEB

Indicate how the SEB will be achieved by ticking the appropriate box and providing the associated information:

- Establish a new SEB Area on land owned by the proponent.
- Use SEB Credit that the proponent has established. Provide the SEB Credit Ref. No. \_\_\_\_\_
- Apply to have SEB Credit assigned from another person or body. The application form needs to be submitted with this Data Report.
- Apply to have an SEB to be delivered by a Third Party. The application form needs to be submitted with this Data Report.
- Pay into the Native Vegetation Fund.

## ON-GROUND SEB

NEOEN have negotiated with a local landowner to purchase land located south-east of GWF 1 Stage 1A, which includes the Worlds End Gorge (Figure 11). This land comprises two parcels totalling approximately 955 ha and is expected to achieve the total required SEB associated with the entire Goyder South Project ('GWF 1 Stage 1A', 'GWF 1 Stage 1B' and the 'Overhead Transmission Line and Substation' stages).

NEOEN have commenced a process of seeking a partner to assist with the delivery of the On-ground SEB, with further details of the on-ground SEB provided in Attachment 5 and Attachment 6.

Detailed assessment of the SEB area, including refined vegetation mapping and SEB Management Plan are currently in development.

Should results of this assessment indicate that the SEB area in Figure 11 cannot achieve the required SEB points in full, NEOEN is committed to investigating further impact minimisation and offset strategies through discussion with the Department for Environment and Water and the NVC.

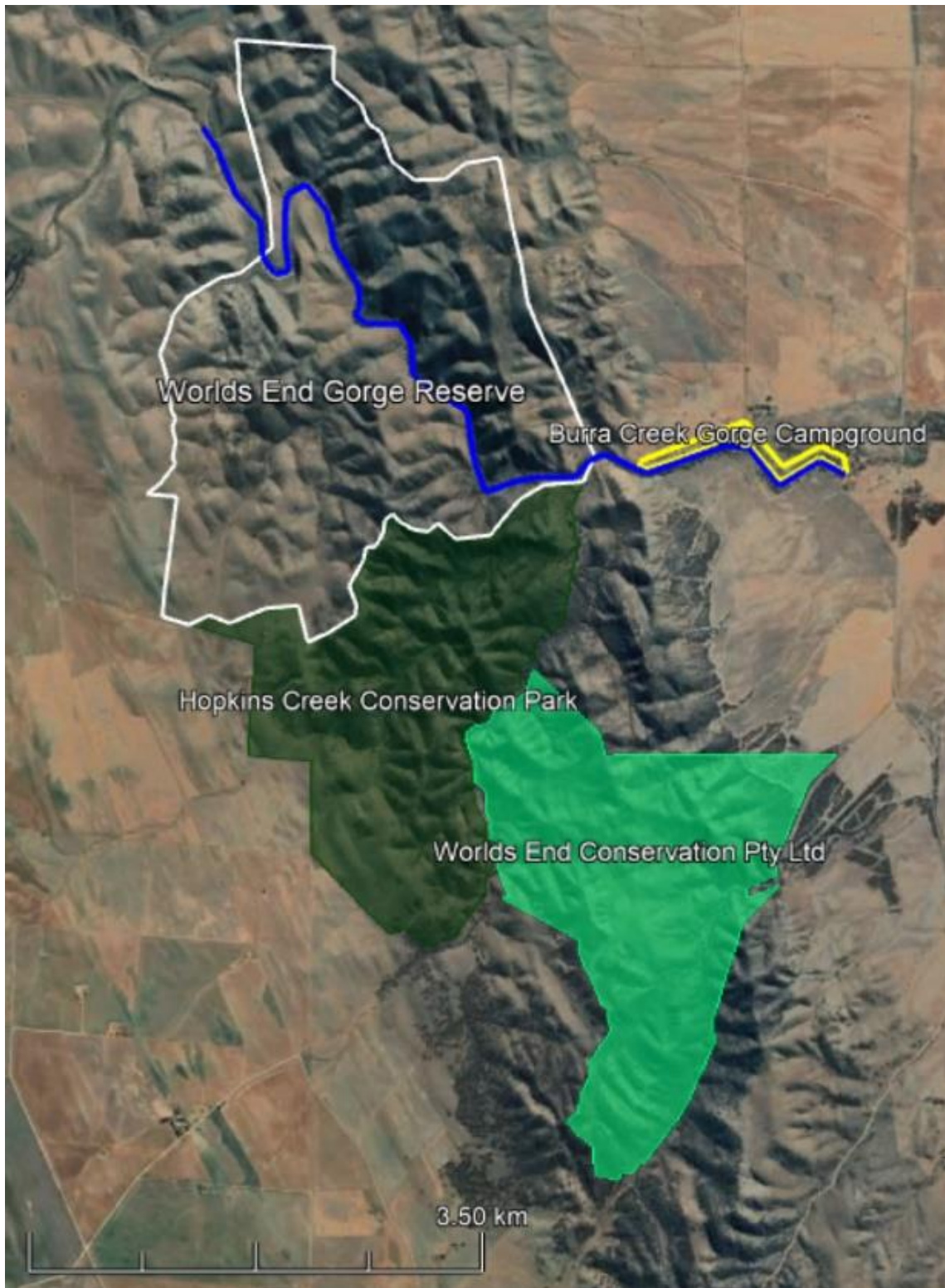


Figure 11. Proposed On-ground SEB Area north of Hopkins Creek Conservation Park (white polygon).

# 7. References

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# 8. Appendices

## Appendix 1. IBRA Bioregions, Subregions and Environmental Associations of the Project Area

Flinders Lofty Block IBRA bioregion	
<p>Temperate to arid Proterozoic ranges, alluvial fans and plains, and some outcropping volcanics, with the semi-arid to arid north supporting native cypress, Black Oak (belah) and mallee open woodlands, <i>Eremophila</i> and <i>Acacia</i> shrublands, and bluebush/saltbush chenopod shrublands on shallow, well-drained loams and moderately-deep, well-drained red duplex soils. The increase in rainfall to the south corresponds with an increase in low open woodlands of <i>Eucalyptus obliqua</i> and <i>E. baxteri</i> on deep lateritic soils, and <i>E. fasciculosa</i> and <i>E. cosmophylla</i> on shallower or sandy soils.</p>	
Broughton IBRA subregion	
<p>This subregion is characterised by a series of wide undulating intramontane basins with red duplex soils, separated by low but distinct northerly trending strike ridges. In the north the region leads into the Southern Flinders Ranges with no sharply defined landform boundary but a land use boundary marking the northern extremity of wheat cultivation. Due to widespread clearing for farming the only significant remnant of native vegetation is found in the Mount (Mt) Remarkable area, where an open forest dominated by <i>Eucalyptus cladocalyx</i> or by <i>E. gonicalyx</i> and <i>E. leucoxyton</i> on reddish dense loams remains. Degraded remnants of <i>E. leucoxyton</i> and <i>E. odorata</i> woodlands can still be found on stony crests and steep slopes.</p>	
Remnant vegetation	Approximately 106330 ha of the subregion is mapped as remnant native vegetation, of which 3064 ha is formally conserved.
Landform	Hills and valleys; alternating subparallel hilly ridges and valleys with a general N-S trend in north. In south, hilly dissected tableland.
Geology	Dissected lateritized surface in south.
Soil	Hard setting loams with red clayey subsoils, highly calcareous loamy earths, hard setting loams with mottled yellow clayey subsoil, coherent sandy soils, cracking clays.
Vegetation	Assumed native vegetation cover.
Conservation significance	55 species of threatened fauna, 113 species of threatened flora. 0 wetlands of national significance.
Burra Hill IBRA environmental association	
Remnant vegetation	Approximately 32624 ha of the association is mapped as remnant native vegetation, of which 1786 ha is formally conserved.
Landform	Steep strike ridge on metasediments with dissected footslopes.
Geology	Metasediments and alluvium.
Soil	Reddish powdery calcareous loams, hard pedal red duplex soils and reddish calcareous earths.
Vegetation	Woodland of SA Blue Gum and Peppermint Box and woodland of SA Blue Gum.
Conservation significance	20 species of threatened fauna, 54 species of threatened flora. 0 wetlands of national significance.

## Hansen IBRA environmental association

Remnant vegetation	Approximately 3% (3738 ha) of the association is mapped as remnant native vegetation, of which 1% (28ha) is formally conserved
Landform	Gentle footslopes forming extensive intramontane plains, with occasional narrow strike ridges on metasediments.
Geology	Colluvium, metasediments and alluvium.
Soil	Hard pedal red duplex soils, reddish powdery calcareous loams, brown self-mulching cracking clays and black self-mulching cracking clays.
Vegetation	Low shrubland of samphire.
Conservation significance	24 species of threatened fauna, 43 species of threatened flora. 0 wetlands of national significance.



## Appendix 2. Flora species recorded in the Project Area during this and previous field surveys.

Scientific Name	Common Name	Status		Recorded during this survey
		EPBC Act	NPW Act	
<i>Acacia pycnantha</i>	Golden Wattle			Yes
<i>Acaena echinata</i>	Sheep's Burr			Yes
<i>Adonis microcarpa</i> *	Pheasant's Eye			
<i>Aira cupaniana</i> *	Small Hair-grass			
<i>Alectryon oleifolius ssp. canescens</i>	Bullock Bush			
<i>Allocasuarina verticillata</i>	Drooping Sheoak			Yes
<i>Alternanthera denticulata</i>	Lesser Joyweed			
<i>Amyema miquelii</i>	Box Mistletoe			
<i>Anagallis sp.*</i>				Yes
<i>Arctotheca calendula</i> *	Cape Weed			Yes
<i>Aristida behriana</i>	Brush Wire-grass			Yes
<i>Arthropodium strictum</i>	Vanilla-lily			Yes
<i>Asperula conferta</i>	Common Woodruff			Yes
<i>Astroloma humifusum</i>	Cranberry Heath			Yes
<i>Atriplex semibaccata</i>	Berry Saltbush			
<i>Austrostipa blackii</i>	Crested Spear-grass			
<i>Austrostipa elegantissima</i>	Feather Spear-grass			Yes
<i>Austrostipa eremophila</i>	Desert Spear-grass			
<i>Austrostipa mollis</i>	Soft Spear-grass			
<i>Austrostipa nitida</i>	Balcarra Spear-grass			
<i>Austrostipa nodosa</i>				Yes
<i>Austrostipa scabra ssp.</i>	Rough Spear-grass			Yes
<i>Austrostipa setacea</i>	Corksrew grass			Yes
<i>Austrostipa sp.</i>	Spear-grass			Yes
<i>Austrostipa trichophylla</i>				Yes
<i>Avena barbata</i> *	Bearded Oat			Yes
<i>Avena sp.*</i>	Oat			Yes
<i>Briza maxima</i> *	Large Quaking-grass			
<i>Bromus diandrus</i> *	Great Brome			Yes
<i>Bromus hordeaceus</i> *	Soft Brome			
<i>Bromus madritensis</i> *	Compact Brome			
<i>Bromus rubens</i> *	Red Brome			
<i>Bromus sp.*</i>	Brome			Yes
<i>Bulbine bulbosa</i>	Bulbine-lily			Yes
<i>Bursaria spinosa ssp. spinosa</i>	Sweet Bursaria			Yes
<i>Caesia calliantha</i>	Blue Grass-lily			Yes
<i>Calandrinia sp.</i>	Purslane/Parakeelya			Yes
<i>Callitris gracilis</i>	Southern Cypress Pine			Yes
<i>Calocephalus citreus</i>	Lemon Beauty-heads			Yes
<i>Carduus tenuiflorus</i>	Scotch Thistle			

Scientific Name	Common Name	Status		Recorded during this survey
		EPBC Act	NPW Act	
<i>Carrichtera annua</i> *	Ward's Weed			
<i>Carthamus lanatus</i> *	Saffron Thistle			Yes
<i>Cassinia laevis</i> ssp. <i>laevis</i>	Curry Bush			Yes
<i>Cassinia</i> sp.	Cassinia			Yes
<i>Centaurea calcitrapa</i> *	Star Thistle			
<i>Cheilanthes austrotenuifolia</i>	Annual Rock-fern			Yes
<i>Cheilanthes lasiophylla</i>	Woolly Cloak-fern			Yes
<i>Cheilanthes</i> sp.	Rock-fern			Yes
<i>Chenopodium pumilio</i>	Clammy Goosefoot			
<i>Chloris truncata</i>	Windmill Grass			
<i>Chrysocephalum apiculatum</i>	Common Everlasting			Yes
<i>Chrysocephalum</i> sp.	Everlasting			Yes
<i>Cirsium</i> sp.*	Thistle			Yes
<i>Clematis microphylla</i>	Old Man's Beard			Yes
<i>Convolvulus angustissimus</i>	Narrow-leaf Bindweed			Yes
<i>Convolvulus erubescens</i>				Yes
<i>Convolvulus remotus</i>	Grassy Bindweed			
<i>Correa glabra</i> var. <i>turnbullii</i>	Smooth Correa			Yes
<i>Cryptandra campanulata</i>	Long-flower Cryptandra		R	Yes
<i>Cucumis myriocarpus</i> *	Paddy Melon			
<i>Cymbopogon ambiguus</i>	Lemon-grass			Yes
<i>Cynara cardunculus</i> ssp. <i>Flavescens</i> *	Artichoke Thistle			Yes
<i>Cynosurus echinatus</i> *	Rough Dog's-tail Grass			
<i>Cyperus gymnocaulos</i>	Spiny Flat-sedge			
<i>Cyperus</i> sp.				
<i>Dianella revoluta</i> var.				Yes
<i>Dissocarpus biflorus</i>	Twin flower saltbush / Twin-horned copperburr			
<i>Dissocarpus paradoxus</i>	Cannonball Burr			
<i>Dodonaea procumbens</i>	Trailing Hopbush	VU	V	
<i>Dodonaea viscosa</i>	Sticky Hop-bush			Yes
<i>Echium vulgare</i> *	Viper's Bugloss			
<i>Ehrharta calycina</i> *	Perennial Veldt Grass			
<i>Einadia nutans</i> ssp.	Climbing Saltbush			Yes
<i>Elymus scaber</i>	Common Wheat-grass			
<i>Enchylaena tomentosa</i>	Ruby Saltbush			Yes
<i>Enneapogon nigricans</i>	Black-head Grass			
<i>Enteropogon acicularis</i>	Curly Windmill Grass			
<i>Epilobium billardierianum</i>	Robust Willow-herb			
<i>Eremophila glabra</i> ssp. <i>Glabra</i>	Tar Bush			
<i>Eremophila longifolia</i>	Weeping Emubush			
<i>Eremophila scoparia</i>	Silver Emubush			
<i>Erodium botrys</i> *	Long Heron's-bill			Yes
<i>Erodium cicutarium</i> *	Cut-leaf Heron's-bill			Yes

Scientific Name	Common Name	Status		Recorded during this survey
		EPBC Act	NPW Act	
<i>Eryngium ovinum</i>	Blue Devil		V	Yes
<i>Eucalyptus camaldulensis</i> ssp. <i>camaldulensis</i>	River Red Gum			
<i>Eucalyptus leucoxylon</i> ssp. <i>pruinosa</i>	Inland South Australian Blue Gum			Yes
<i>Euphorbia drummondii</i>	Caustic Weed			
<i>Eutaxia microphylla</i>	Common Eutaxia			
<i>Exocarpos aphyllus</i>	Leafless ballart			
<i>Exocarpos cupressiformis</i>	Native Cherry			Yes
<i>Foeniculum vulgare</i> *	Fennel			
<i>Galium gaudichaudii</i>	Rough Bedstraw			
<i>Galium</i> sp.	Bedstraw			Yes
<i>Gazania</i> sp.*	Gazania			
<i>Geranium retrorsum</i>	Grassland Geranium			Yes
<i>Geranium</i> sp.	Geranium			Yes
<i>Glycine rubiginosa</i>	Twining Glycine			Yes
<i>Gomphocarpus cancellatus</i> *	Broad-leaf Cotton-bush			Yes
<i>Gonocarpus elatus</i>	Hill Raspwort			Yes
<i>Gonocarpus</i> sp.	Raspwort			Yes
<i>Gonocarpus tetragynus</i>	Small-leaf Raspwort			
<i>Goodenia willisiana</i>	Silver Goodenia			
<i>Hedypnois rhagadioloides</i> *	Cretan Weed			
<i>Heliotropium curassavicum</i> *	Smooth Heliotrope			
<i>Heliotropium europaeum</i> *	Common Heliotrope			Yes
<i>Holcus lanatus</i> *	Yorkshire Fog			
<i>Hordeum leporinum</i> *	Wall Barley-grass			
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort			Yes
<i>Hypochaeris glabra</i> *	Smooth Cat's Ear			Yes
<i>Hypochaeris radicata</i> *	Rough Cat's Ear			Yes
<i>Juncus flavidus</i>	Yellow Rush			
<i>Juncus kraussii</i>	Sea Rush			Yes
<i>Juncus</i> sp.				
<i>Juncus subsecundus</i>	Finger Rush			
<i>Juncus usitatus</i> *	Common Rush			
<i>Kennedia prostrata</i>	Scarlet Runner			
<i>Lactuca serriola</i> *	Prickly Lettuce			
<i>Lepidium africanum</i> *	Common Peppercross			Yes
<i>Lepidium</i> sp.*	Peppercross			Yes
<i>Lepidosperma</i> sp.	Sword-sedge			
<i>Lepidosperma viscidum</i>	Sticky Sword-sedge			
<i>Linum trigynum</i> *	French Flax			
<i>Lolium loliaceum</i> *	Stiff Ryegrass			
<i>Lolium rigidum</i> *	Wimmera Ryegrass			
<i>Lolium</i> sp.*	Ryegrass			
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush			

Scientific Name	Common Name	Status		Recorded during this survey
		EPBC Act	NPW Act	
<i>Lomandra effusa</i>	Scented Mat-rush			Yes
<i>Lomandra micrantha</i>	Small-flower Mat-rush			Yes
<i>Lomandra multiflora ssp. dura</i>	Hard Mat-rush			Yes
<i>Lythrum hyssopifolia</i> *	Lesser Loosestrife			
<i>Maireana brevifolia</i>	Short-leaf Bluebush			
<i>Maireana ciliata</i>	Hairy Fissure-plant			
<i>Maireana enchylaenoides</i>	Wingless Fissure-plant			Yes
<i>Maireana rohrlachii</i>	Rohrlach's Bluebush			
<i>Maireana sp.</i>	Bluebush/Fissure-plant			Yes
<i>Malva parviflora</i> *	Small-flowered Mallow			
<i>Marrubium vulgare</i> *	Horehound			Yes
<i>Medicago minima</i> *	Little Medic			Yes
<i>Medicago polymorpha</i> *	Burr Medic			
<i>Medicago sativa</i> *	Lucerne			
<i>Medicago sp.*</i>	Medic			Yes
<i>Mentha satureioides</i>	Native Pennyroyal		R	
<i>Mesembryanthemum crystallinum</i> *	Common Iceplant			
<i>Mesembryanthemum nodiflorum</i> *	Slender Iceplant			
<i>Moraea setifolia</i> *	Thread Iris			Yes
<i>Neatostema apulum</i> *	Hairy Sheepweed			
<i>Neurachne alopecuroidea</i>	Fox-tail Mulga-grass			
<i>Nicotiana glauca</i> *	Tobacco tree			
<i>Onopordum acaulon</i> *	Horse Thistle			Yes
<i>Onopordum sp.*</i>	Thistle			Yes
<i>Oxalis perennans</i>	Native Sorrel			Yes
<i>Oxalis pes-caprae</i> *	Soursob			Yes
<i>Parietaria debilis</i>	Smooth-nettle			Yes
<i>Pauridia glabella var. glabella</i>	Tiny Star			Yes
<i>Pelargonium littorale</i>	Native Pelargonium			
<i>Petrorhagia dubia</i> *	Velvet Pink			
<i>Phalaris sp.*</i>	Canary Grass			Yes
<i>Philothea verrucosa</i>	Bendigo Wax-flower		V	Yes
<i>Phragmites australis</i>	Common Reed			
<i>Pimelea curviflora var. micrantha</i>	Silky Riceflower			
<i>Piptatherum miliaceum</i> *	Rice Millet			
<i>Plantago lanceolata</i> *	Plantago			
<i>Pleurosorus rutifolius</i>	Blanket Fern			Yes
<i>Poa annua</i> *	Winter Grass			Yes
<i>Polygonum aviculare</i> *	Wireweed			
<i>Pterostylis sp.</i>	Greenhood			Yes
<i>Ptilotus erubescens</i>	Hairy-tails		R	
<i>Ptilotus spathulatus</i>	Pussy-tails			Yes
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	Yes

Scientific Name	Common Name	Status		Recorded during this survey
		EPBC Act	NPW Act	
<i>Ranunculus sp.</i>	Buttercup			Yes
<i>Romulea minutiflora</i> *	Small-flower Onion-grass			Yes
<i>Rosa canina</i> *	Dog Rose			Yes
<i>Rumex dumosus</i>	Wiry Dock		R	Yes
<i>Rumex sp.</i>	Dock			Yes
<i>Rytidosperma carphoides</i>	Short Wallaby-grass			Yes
<i>Rytidosperma setaceum</i>	Small-flower Wallaby-grass			Yes
<i>Rytidosperma sp.</i>	Wallaby-grass			Yes
<i>Rytidosperma tenuior</i>	Short-awn Wallaby-grass		R	
<i>Salsola australis</i>	Buckbush			Yes
<i>Salvia verbenaca var. verbenaca</i> *	Wild Sage			Yes
<i>Scaevola sp.</i>	Fanflower			Yes
<i>Scaevola spinescens</i>	Spiny Fanflower			
<i>Schinus molle</i> *	Pepper tree			
<i>Sida corrugata</i>	Corrugated Sida			
<i>Sclerolaena decurrens</i>	Green Copperburr			
<i>Sclerolaena diacantha</i>	Grey Copperburr			
<i>Sclerolaena obliquicuspis</i>	Limestone Bindii			
<i>Sclerolaena patenticuspis</i>	Spear-fruit Copperburr			
<i>Senna artemisioides</i>	Variable Senna			
<i>Solanum elaeagnifolium</i> *	Silver-leaf Nightshade			Yes
<i>Solanum nigrum</i> *	Black Nightshade			Yes
<i>Themeda triandra</i>	Kangaroo Grass			Yes
<i>Trifolium arvense</i> *	Hares foot clover			
<i>Velleia arguta</i>	Sharp-toothed Velleia			
<i>Vittadinia blackii</i>	Narrow-leaf New Holland Daisy			
<i>Vittadinia cuneata var. cuneata</i>	Fuzzy New Holland Daisy			Yes
<i>Vittadinia sp.</i>	New Holland Daisy			Yes
<i>Wahlenbergia luteola</i>	Yellow-wash Bluebell			
<i>Wahlenbergia sp.</i>	Native Bluebell			Yes
<i>Wurmbea dioica</i>	Early Nancy			Yes
<i>Xanthosia leiophylla</i>	Cut-leaf Xanthosia			Yes
<i>Zygophyllum apiculatum</i>	Common Twinleaf			

EPBC Act: CR=Critically Endangered, EN=Endangered, VU=Vulnerable

NPW Act: E=Endangered, V=Vulnerable, R=rare

## Appendix 3. Likelihood of occurrence of threatened species

### Threatened Fauna

Scientific Name	Common Name			Sighting Date	Data Source	PMST Report	Habitat	Likelihood
		EPBC Act	NPW Act					
<i>Actitis hypoleucos</i>	Common Sandpiper	Mi	R		2	May occur	Habitat is banks, rocks and sandy beaches near water. Found in coastal or inland wetlands, both saline or fresh.	Unlikely No wetland habitat will be impacted by the Project.
<i>Anhinga novaehollandiae novaehollandiae</i>	Australasian Darter		R	2000	1		Habitat is lakes, rivers, swamps; rarely coastal.	Unlikely No wetland habitat will be impacted by the Project.
<i>Anseranas semipalmata</i>	Magpie Goose		E	1983	1		Habitat is rush and sedge dominated shrubs and flood plains. The species historically occurred throughout much of Australia and has recently declined in range since the time of European settlement in Australia. Records show that, similar to current distributions, the Magpie Goose was abundant on the coastal plains of Northern Australia, the Gulf of Carpentaria and the East Coast of Australia, however populations were also present in the southern region of Western Australia and areas of New South Wales, Victoria and South Australia.	Unlikely No wetland habitat will be impacted by the Project.

<i>Aprasia pseudopulchella</i>	Flinders Worm-lizard	VU		2016	1, 2	Known to occur	The Flinders Ranges Worm-lizard is known from the Flinders Ranges of South Australia, extending south to the western slopes and northern and central Mount Lofty Ranges. It is also found in the northern suburbs of Adelaide and the Mount Remarkable National Park. The species is known to occur within the Adelaide and Mount Lofty Ranges and the South Australian Arid Lands Natural Resource Management Region. Occurs in open woodland, native tussock grassland, riparian habitats and rocky isolates.	Likely in all vegetation associations.  The Project Area falls within the known distribution of the species, there are recent records nearby and suitable habitat is widespread throughout the Project Area. Although targeted surveys have been carried out and no lizards located in the Project Area, the species is cryptic and difficult to find. Survey effort has not been sufficient to indicate this species is absent.
<i>Apus pacificus</i>	Fork-tailed Swift	Mi			2	Likely to occur	Widespread but almost exclusively aerial. Mostly occur over inland plains and dry or open habitats.	Possible in all vegetation association.  This species is exclusively aerial in Australia. Although it may possibly occur over the Project Area, it is unlikely to use terrestrial habitats.
<i>Ardeotis australis</i>	Australian Bustard		V	2018	1		Mainly occurs in inland Australia and is now scarce or absent from southern and south-eastern Australia. Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams.	Possible in all vegetation associations.  Suitable habitat is widespread in the Project Area and there are recent records within 5 km of the Project Area.
<i>Biziura lobata menziesi</i>	Musk Duck		R	1996	1		Endemic to Australia. Occurs in deep freshwater lagoons, with dense reed beds. They are normally seen singly or in pairs, but may form medium to large groups in the winter.	Unlikely  No wetland habitat will be impacted by the Project.

<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN			2	May occur	Found mainly in freshwater wetlands and, rarely, in estuaries or tidal wetlands, favouring wetlands dominated by sedges, rushes and reeds growing over a muddy or peaty substrate.	Unlikely No wetland habitat will be impacted by the Project.
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Mi			2	Known to occur	During the non-breeding season, most of the world population of Sharp-tailed Sandpipers occurs in Australia. In SA and Victoria, numbers are generally highest between January and early February. In Gulf St Vincent, SA, some arrive during September–October, with the greatest numbers during December. Movements occur during the non-breeding period where birds appear to be dispersive, moving to temporary or flooded wetlands and leaving them when they dry. On migration, they forage and roost on rocky and sandy beaches, freshwater habitats and inland saltwater habitats.	Unlikely No wetland habitat will be impacted by the Project.



<i>Calidris ferruginea</i>	Curlew Sandpiper	CR			2	Likely to occur	<p>In Australia, Curlew Sandpipers occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north. In South Australia, Curlew Sandpipers occur in widespread coastal and subcoastal areas east of Streaky Bay. Important sites include Imperial Chemical Industries (ICI) and Price Saltfields, and The Coorong. Occasionally they occur in inland areas south of the Murray River and elsewhere. Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters.</p>	<p>Unlikely</p> <p>No wetland habitat will be impacted by the Project.</p>
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<i>Calidris melanotos</i>	Pectoral Sandpiper	Mi	R		2	May occur	In South Australia, the Pectoral Sandpiper is found mostly in the south-east, from north to the Murray River and west to Yorke Peninsula. Outside of this region the species is occasionally recorded in Innamincka, Welcome Bore and Mintabie. In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	Unlikely No wetland habitat will be impacted by the Project.
<i>Cinlosoma castanotum (NC)</i>	Chestnut-backed Quailthrush (Chestnut Quailthrush)		R	2012	1		Endemic to arid and semi-arid southern Australia, reaching its northern extent in the south of the Northern Territory. Throughout its distribution it occurs in a wide range of arid and semi-arid habitats; mainly in the low shrubs and undergrowth of mallee scrub, but also in Acacia scrubs, dry sclerophyll woodland, heath, and native pine.	Possible in VA10. Most woodland in the Project Area is not suitable habitat for the species due to the lack of low shrubs and understorey vegetation. However, the species may occur in <i>Callitris</i> sp. woodland where a higher shrub cover occurs.
<i>Cladorhynchus leucocephalus</i>	Banded Stilt		V	2003	1		Endemic to Australia, mainly in the south and inland. Found mainly in saline and hypersaline (very salty) waters of the inland and coast, typically large, open and shallow wetlands.	Unlikely No wetland habitat will be impacted by the Project.
<i>Corcorax melanorhamphos</i>	White-winged Chough		R	2021	1, 3, 5		White-winged Choughs are found in open forests and woodlands. They tend to prefer the wetter areas, with lots of leaf-litter, for feeding, and available mud for nest building.	Known in VA6, VA10 and VA24 The species has been recorded during this and past surveys in the Project Area. Confined to remnant woodland patches.

<i>Coturnix ypsilophora australis</i>	Brown Quail		V	2015	1		Found across northern and eastern Australia, from the Kimberley region in Western Australia to Victoria and Tasmania, as well as in south-western Australia. It is also found in Papua New Guinea and Indonesia, and has been introduced to New Zealand. Prefers dense grasslands, often on the edges of open forests, and bracken. May sometimes be seen alongside roads.	Highly likely in all vegetation associations.  Although not recorded during any survey of the Project Area, suitable habitat is extensive and recent records occur within 5 km of the Project Area.
<i>Falco hypoleucos</i>	Grey Falcon	VU			2	Likely to occur	The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (Marchant and Higgins 1993). The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter.	Unlikely.  There are no recent records within 5 km of the Project Area and habitat is unsuitable.

<i>Falco peregrinus macropus</i>	Peregrine Falcon		R	2012	1		This species prefers open habitats such as grasslands, tundra and meadows and nests on cliff faces and in crevices. It has an extremely large range and is found world-wide except for rainforests and cold, dry Arctic regions. This species has increasingly been observed inhabiting urban areas.	Known in all vegetation associations.  The species has been recorded in the Project Area by previous surveys.
<i>Galaxias rostratus</i>	Flathead Galaxias	CR			2	May occur	The flathead galaxias is only known from the southern half of the Murray-Darling Basin system. The species once occurred in the middle reaches, usually below 150 m in altitude, of the Lachlan, Murrumbidgee and Murray river catchments in New South Wales, and the Mitta Mitta, Kiewa, Ovens, Loddon, Goulburn and Murray river catchments in Victoria. There have been isolated records from a lagoon near Bathurst in New South Wales (in the Macquarie River catchment) and from the Lower Murray River in South Australia. The flathead galaxias inhabits a variety of habitats including billabongs, lakes, swamps and rivers, with a preference for still or slow flowing waters. The species has a preference for schooling in midwater	Unlikely.  No aquatic habitats are being impacted.

<i>Gallinago hardwickii</i>	Latham's Snipe	Mi		2	May occur	<p>Latham's Snipe is a non-breeding visitor to south-eastern Australia, and is a passage migrant through northern Australia (i.e., it travels through northern Australia to reach non-breeding areas located further south). The species has been recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia (including the Adelaide plains and Mount Lofty Ranges, and the Eyre Peninsula). The range extends inland over the eastern tablelands in south-eastern Queensland (and occasionally from Rockhampton in the north), and to west of the Great Dividing Range in New South Wales. The species is widespread in Tasmania and is found in all regions of Victoria except for the north-west. In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g., swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity. Latham's Snipe occurs in temperate and tropical regions of Australia.</p>	<p>Unlikely.</p> <p>No wetland habitat will be impacted by the Project.</p>
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<i>Grantiella picta</i>	Painted Honeyeater	VU			2	Likely to occur	Sparsely distributed from southern Victoria and south-eastern South Australia to far northern Queensland and eastern Northern Territory. Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries.	Unlikely.  There are no nearby records of the species. Suitable woodland habitat is very limited and generally has a very low cover of mistletoe species.
<i>Hieraaetus morphnoides</i>	Little Eagle		V	2016	1		The Little Eagle is widespread in mainland Australia, central and eastern New Guinea. It is seen over woodland and forested lands and open country, extending into the arid zone. It tends to avoid rainforest and heavy forest.	Likely in VA6, VA10 and VA24.  Woodland habitats are suitable for the species, with recent records within 5 km of the Project Area.
<i>Leipoa ocellata</i>	Malleefowl	VU	V		2	Likely to occur	The original distribution of Malleefowl covered much of the southern half of the continent from the west coast to the Great Dividing Range in the east. The Malleefowl is now found principally in the semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as Broombush ( <i>Melaleuca uncinata</i> ) and Scrub Pine ( <i>Callitris verrucosa</i> ). Malleefowl also occur in Red Ironbark ( <i>Eucalyptus sideroxylon</i> ) woodland at the eastern limit of their distribution and in Brown Stringybark ( <i>E. baxteri/E. araneosa</i> ) woodland in the south of Victoria and South Australia. A sandy substrate and abundance of leaf litter are clear requirements for the construction of the birds' incubator-nests. Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils and where shrub diversity is greatest.	Unlikely.  There are no recent nearby records and no suitable Mallee habitat in the Project Area.

<i>Maccullochella peelii</i>	Murray Cod	VU			2	May occur	The distribution of the Murray Cod occurs in the following bioregions according to the Interim Biogeographic Regionalisation for Australia (IBRA7): Murray-Darling Depression, Riverina, NSW South Western Slopes, South Eastern Highlands, Cobar Peneplain, Darling Riverine Plains, Brigalow Belt South and Nandewar. The Murray Cod utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW (including the ACT), to slow-flowing, turbid lowland rivers and billabongs.	Unlikely. No aquatic habitats will be impacted.
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (YP, MN, AP, MLR, MM, SE)		R	2019	1, 3		Occurs across south-eastern Australia, most of NSW, VIC and south-eastern SA. South-eastern subspecies found in Eucalypt woodland and Mallee and Acacia shrubland.	Known in VA6, VA10 and VA24. Previous surveys of the Project Area have recorded the species in woodland areas.
<i>Melithreptus gularis</i>	Black-chinned Honeyeater		V	2006	1		The Black-chinned Honeyeater is found in the upper levels of open eucalypt forests and woodlands dominated by box and ironbark eucalypts. It is often found along waterways, especially in arid and semi-arid areas and in northern Australia. It is occasionally seen in gardens and street trees.	Possible in VA6. Although there are recent records of the species nearby, habitat is limited to <i>Eucalyptus</i> sp. woodlands, which are not extensive in the Project Area.
<i>Microeca fascinans fascinans</i>	Jacky Winter (MLR, SE)		R	2017	1		Widely distributed throughout mainland Australia. Prefer open woodland (Eucalypt and mallee) with an open shrub layer and bare ground. Often seen in farmland and parks.	Likely in VA6, VA10 and VA24 Not recorded in the Project Area by previous surveys, however woodland habitats are suitable for the species and there are recent records nearby.

<i>Motacilla cinerea</i>	Grey Wagtail	Mi			2	May occur	European and Asian species. Migrates south in winter, usually to Indonesia and NG. Rarely reaches Australia, but when it does, favours habitat near freshwater streams, also mown grass, ploughed land or near sewage ponds.	Unlikely. No wetland habitat will be impacted by the Project.
<i>Motacilla flava</i>	Yellow Wagtail	Mi				May occur	Open country near swamps, salt marshes, sewage ponds, grassed surrounds to airfields, bare ground. Occasionally on drier inland plans. Rare but regular visitor around Aust coast especially the NW coast Broome to Darwin.	Unlikely. No wetland habitat will be impacted by the Project.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi	E	2019	1, 2, 3	Known to occur	Known inhabitant of forest, woodland, mangroves and coastal heath scrub. Prefers dense, wet gullies of heavy eucalypt forest in breeding season.	Known in VA6, VA10 and VA24 Recorded in the Project Area during previous surveys, with suitable habitat restricted to woodland areas.
<i>Myiagra inquieta</i>	Restless Flycatcher		R	2019	1, 3		Found throughout northern and eastern mainland Australia, as well as in south-western Australia. The Restless Flycatcher is found in open forests and woodlands and is frequently seen in farmland.	Known in VA6, VA10 and VA24. Recorded in the Project Area during previous surveys, with suitable habitat restricted to woodland areas.



<i>Neophema chrysostoma</i>	Blue-winged Parrot		V	2001	1		This species mainly occurs in Tasmania and Victoria, particularly in southern Victoria and the midlands and eastern areas of Tasmania however sparser populations are also found in western New South Wales and eastern South Australia, extending to south-west Queensland and occasionally into the Northern Territory. Prefers grasslands and grassy woodlands but will inhabit a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones.	Possible in all vegetation associations.
<i>Neophema elegans elegans</i>	Elegant Parrot		R	2019	1, 3		The Elegant Parrot occurs in western Victoria and south-western New South Wales (along the lower reaches of the Darling River), eastern parts of South Australia, north to the Flinders Ranges and west to the Eyre Peninsula, and also in Western Australia. Inhabiting open habitats, the Elegant Parrot can be found in a wide variety of habitats, including grasslands, shrublands, mallee, woodlands and thickets, bluebush plains, heathlands, saltmarsh and farmland.	Known in all vegetation associations.  Previously recorded in the Project Area, the species is likely to occur mostly in woodland vegetation, although it may utilise grasslands for foraging.

<p><i>Numenius madagascariensis</i></p>	<p>Eastern Curlew</p>	<p>CR</p>		<p>2</p>	<p>May occur</p>	<p>Within Australia, the Eastern Curlew has a primarily coastal distribution. The species is found in all states, particularly the north, east, and south-east regions including Tasmania. Eastern Curlews are rarely recorded inland. They have a continuous distribution from Barrow Island and Dampier Archipelago, Western Australia, through the Kimberley Division and along Northern Territory, Queensland, and NSW coasts and the islands of Torres Strait. They are patchily distributed elsewhere. The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms.</p>	<p>Unlikely. No wetland habitat is being impacted by the Project.</p>
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<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat				2	May occur	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bullocke <i>Allocasuarina luehmannii</i> and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	Unlikely.  The Project Area is outside the core area of distribution of the species, there are no recent records within 5 km and suitable woodland habitat is limited in extent.
<i>Pachycephala inornata</i>	Gilbert's Whistler		R	1986	2		Sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. Habitat is shrubby woodland and mallee.	Unlikely.  Records within 5 km of the Project Area are before 1995 and there is very limited shrubby woodland habitat in the Project Area.
<i>Pandion haliaetus</i>	Osprey	Mi			2	May occur	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands.	Unlikely.  No wetland habitat is being impacted by the Project.
<i>Pedionomus torquatus</i>	Plains Wanderer	CR			2	May occur	The Plains-wanderer occurs at scattered sites in Queensland, NSW, Victoria and SA. Inhabits sparse, treeless, lowland native grasslands with approximately 50% bare ground, most vegetation less than 5 cm in height, with some widely-spaced plants up to 30 cm high.	Unlikely.  There are no records of the species within 5 km of the Project Area. Although the Project Area is dominated by grasslands, habitat that meets the specialised needs of the species, in terms of vegetation cover and other characteristics, are very limited.

<i>Petroica boodang boodang</i>	Scarlet Robin		R	2008	1		Found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. Lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	Possible in VA6, VA10 and VA24.  There are records within 20 years within 5 km, however habitat is limited to woodland areas.
<i>Pezoporus occidentalis</i>	Night Parrot	EN			2	Extinct in area	The distribution of the Night Parrot is very poorly understood. There are a small number of confirmed and well-regarded records from arid and semi-arid regions of Queensland, South Australia, Western Australia, and the Northern Territory. inhabits arid and semi-arid areas that are characterised by having dense, low vegetation. Based on accepted records, the habitat of the Night Parrot consists of <i>Triodia</i> grasslands in stony or sandy environments, and of samphire and chenopod shrublands, including genera such as <i>Atriplex</i> , <i>Bassia</i> and <i>Maireana</i> , on floodplains and claypans, and on the margins of salt lakes, creeks or other sources of water.	Unlikely.  The species is extinct in the Project Area.
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater		R	2017	1		The Striped Honeyeater is found in eastern Australia, mainly inland, from the Yorke Peninsula, South Australia to the coast of New South Wales, around Toukley, and north to Charters Towers, Queensland. The Striped Honeyeater is found in forests and woodlands, often along rivers, as well as mangroves and in urban gardens.	Possible in VA6, VA10 and VA24.  There are records of the species in the past 10 years, however habitat in limited to small patches of woodland areas.

<i>Porzana tabuensis</i>	Spotless Crake		R	2002	1		<p>Mostly coastal distribution: south-east Australia and coastal WA, TAS and many islands. Winter visitor to north east NT and north east QLD. Occurs inland irregularly, in good seasons. Found in well vegetated freshwater wetlands with rushes, reeds and cumbungi. Will also frequent muddy areas, reedbeds or wetlands.</p>	<p>Unlikely.</p> <p>No wetland habitat is being impacted by the Project.</p>
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<i>Rostratula australis</i>	Australian Painted-snipe	EN	E	2001	1, 2	May occur	<p>The Australian Painted Snipe has been recorded at wetlands in all states of Australia. It is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia. It has been recorded less frequently at a smaller number of more scattered locations farther west in South Australia, the Northern Territory and Western Australia. It has also been recorded on single occasions in south-eastern Tasmania and at Lord Howe Island. The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum (<i>Muehlenbeckia</i>) or canegrass or sometimes tea-tree (<i>Melaleuca</i>).</p>	<p>Unlikely.</p> <p>No wetland habitat is being impacted by the Project.</p>
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<i>Stagonopleura guttata</i>	Diamond Firetail		V	2021	1, 3, 5		Endemic to Australia, occurring mainly on the inland slopes of the Great Dividing Range and in the AMLR/Eyre Peninsula region of SA. Reside in a wide range of Eucalypt dominated vegetation communities that have a grassy understorey, including woodland, forest and mallee. Most occur on the inland slopes of the Great Dividing Ranges, with only small pockets near the coast.	Known in VA6, VA10 and VA24.  The species was recorded during the field survey in woodland areas.
<i>Tiliqua adelaidensis</i>	Pygmy Blue-tongue	EN	E	2021	1, 2, 3, 4	Known to occur	The Pygmy Blue-tongue Lizard is now known from 31 sites, ranging from Peterborough in the north to Kapunda in the south, and to the South Hummocks (north of Port Wakefield) in the west (Figure 1). All known populations are located on private land, most of which is used for sheep grazing. The vegetation of all known sites is remnant native grassland or grassy woodland with a sparse over-storey of trees. Pygmy Blue-tongue Lizards do not appear to be confined to a particular floristic community of native grassland, and have been recorded at sites dominated by species including spear grasses ( <i>Austrostipa</i> spp.), wallaby grasses ( <i>Rytidosperma</i> spp.), bluebush ( <i>Maireana</i> spp.), Brush Wire-grass ( <i>Aristida behriana</i> ) and iron-grasses ( <i>Lomandra</i> spp.).	Known in VA2 and VA8.  The species has been recorded in the Project Area in grassland areas.

<i>Trichosurus vulpecula</i>	Common Brushtail Possum		R	2008	1	<p>Anywhere where trees with suitable hollows occur, including open forests and woodlands but also urban areas and cities. The species can be common in urban areas. One of the best-known marsupials; found in most treed environments, including cities, towns and farmland.</p> <p>Reintroduced to many locations, including the Flinders Ranges, along the River Murray (extant) and on Thistle Island (extant).</p>	<p>Possible in VA6, VA10 and VA24.</p> <p>Records occur within 5 km of the Project Area in the last 20 years, however suitable habitat is limited to woodland areas.</p>
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<i>Tringa nebularia</i>	Common Greenshank					<p>The Common Greenshank does not breed in Australia; however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia. In South Australia, the species is found throughout the area east of 145° E, but there are a few records from the Flinders Ranges. It is also occasionally seen inland west of 145° E. It is found in all coastal regions west to, at least, Streaky Bay, with scattered records elsewhere along the coast. This species is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores.</p>	<p>Unlikely.</p> <p>No wetland habitat is being impacted by the Project.</p>
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<i>Turnix varius varius</i>	Painted Buttonquail		R	2015	1		<p>These birds range almost continuously, in appropriate habitat, from about the Atherton Tableland in Qld, round the coast to the Eyre Peninsula and north to the southern Flinders Ranges in SA, avoiding only the driest regions of Qld and NSW. Temperate and eastern tropical forests and woodlands form the habitats of this species. They appear to prefer closed canopies with some understorey and deep leaf litter on the ground.</p>	<p>Possible in VA6, VA10 and VA24.</p> <p>Recorded in the last 10 years within 5 km of the Project Area, however suitable habitat is very limited, with most woodland areas not having required habitat elements of deep litter and closed canopies.</p>
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EPBC Act; Ex = Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable

NPW Act; E = Endangered, V = Vulnerable, R = Rare

Source; 1 = BDBSA, 2 = Protected Matters Search Tool, 3 = EBS Ecology 2020, 4 = EBS Ecology 2021a, 5 = This survey

**Threatened Flora**

Scientific Name	Common Name	EPBC Act	NPW Act	Sighting Date	Data Source	PMST Result	Habitat	Likelihood
<i>Acacia genistifolia</i>	Broom Wattle		E	1990	1		Only recently collected in SA and confined to limited colony on the Gap Road north of Mintaro. Also in N.S.W. & Vic.	Unlikely.  Project Area is outside the known area of occurrence of the species.
<i>Acacia glandulicarpa</i>	Hairy-pod Wattle	VU	E	2008	1, 2	Known to occur	Semi-arid environments with a mean annual rainfall of 400–500 mm, with many records at sites coinciding with gentle slopes at the transition zone between heavy clay/gravel soils on the flats and sandy soils on the rises. Main population in western Victoria/SA border. The other SA sub-population located in the in the Booborowie-Burra Gorge-Hanson-Farrell Flat area (DSEWPC, 2014). It grows in alkaline soil on rocky hills in open scrub (at Burra), or in eucalypt open forest.	Possible in VA6.  Habitat in the project Area limited to VA6, with no records of the species despite numerous surveys being undertaken in the Project Area.
<i>Acacia iteaphylla</i>	Flinders Ranges Wattle		R	2004	1		SA: FR E NL SL SE, but naturally occurs in the Flinders Ranges, across to the Gawler Ranges, and on the Eyre Peninsula. Naturalised beyond its native range in some parts of south-eastern and southern SA. Also naturalised in some parts of NSW, in the coastal and sub-coastal districts of south-western WA and in the central and western parts of Vic. Grows mainly among rocky outcrops on hillsides or along rocky creeks in valleys.	Unlikely.  The Project Area is outside the natural area of occurrence for the species.

<i>Acacia menzeli</i>	Menzel's Wattle	VU			2	May occur	Endemic to SA, the species is confined to localised areas around Monarto and Murray Bridge, Lofty Ranges and Flinders Ranges (around Brachina). The Northern Flinders Ranges populations are considered relicts. It occurs as scattered shrubs; either on roadsides, or in low open shrubby woodland on more rocky sites and found in open <i>Eucalyptus</i> scrub where associated species include <i>Eucalyptus socialis</i> (Beaked-red Mallee), <i>E. incrassata</i> (Ridge-fruited Mallee), <i>Callitris gracilis</i> (Southern Cypress Pine) and <i>E. odorata</i> (Peppermint Box on calcareous loamy earths.	Unlikely. The Project Area is outside the natural area of occurrence for the species.
<i>Acacia montana</i>	Mallee Wattle		R	1977	1		SA: EP NL MU SL SE. A small occurrence in the Northern Lofty region between Clare and Jamestown then into the Murray region near Truro and along the Murray near Murray Bridge to Mannum. In open forests or tall shrublands associated with <i>Eucalyptus gracilis</i> and <i>E. socialis</i> . Soils: hard alkaline red duplex and grey-brown calcareous loamy earths. Rainfall 350-500 mm.	Unlikely. The Project Area is outside the natural area of occurrence for the species.

<i>Acacia spilleriana</i>	Spiller's Wattle	EN	E	2021	1, 2, 4, 5	Known to occur	Endemic to SA, this species has severely fragmented populations occurring in the northern Mount Lofty Ranges and in the ranges around Burra and Auburn. Most populations are on road verges, except for larger populations that occur in the Burra Gorge/Hallelujah Hills area. Grows on rocky hills, commonly along watercourses and roadsides. Associated with species such as <i>Acacia calamifolia</i> (Wallowa) and communities dominated by <i>Eucalyptus gracilis</i> (Yorrell), <i>E. socialis</i> (Beaked Red Mallee) and <i>E. brachycalyx</i> (Gilja) open scrub with a shrubby understorey and <i>E. camaldulensis</i> (River Red Gum) woodland.	Possible in VA6, VA10 and VA24.  Not detected in the Project Area during the survey, however the species occurs nearby, with habitat limited to woodland areas.
<i>Amphibromus archeri</i>	Pointed Swamp Wallaby-grass		R	1999	1		SA: FR EP NL MU SL KI SE. Grows in damp areas such as lagoons, waterholes and swamps, often on predominantly sandy soils. On EP, Known from one record north of Cleve and east of Mt Desperate. Grows in temporarily or permanently wet sites in open woodland communities.	Unlikely.  There are no swamps or wetlands impacted by the project.
<i>Asperula syrticola</i>	Southern Flinders Woodruff		R	2005	1		SA: FR EP NL MU. Grows under mallee and Eucalyptus woodlands. Also recorded from <i>Acacia pycnantha</i> Very Low Open Woodland over <i>Triodia</i> sp. Sometimes associated with limestone ridges.	Possible in VA6.  There are records of the species within the last 20 years, however habitat is very limited in the project Area to VA6.
<i>Atriplex australasica</i>			R	1921	1		Found in wet brackish situations, often coastal. SA: MU YP SL KI SE.	Unlikely.  There are no swamps or wetlands impacted by the project.

<i>Austrostipa breviglumis</i>	Cane Spear-grass		R	2008	1		In SA occurs in FR, EP, NL and SL regions. Also from Vic. Habitat is rocky gullies to ridge tops, often in seasonally wet areas dominated by woodlands with <i>Eucalyptus odorata</i> , <i>Xanthorrhoea quadrangulata</i> , <i>Bursaria spinosa</i> and <i>Callitris glaucophylla</i> .	Possible in VA6, VA10 and VA24.  Habitat is limited to woodland areas on rocky hill tops and slopes.
<i>Austrostipa densiflora</i>	Fox-tail Spear-grass		R	1994	1		SA: FR, EA, MU, SL, KI. Also from Qld, NSW and Vic. Occurs in a range of soils, especially sandy, but also rich soils associated with rocky places, including limestone. Has been recorded from disturbed places in woodlands and grasslands.	Possible in all vegetation associations.  Habitat is broadly suitable for the species, however there are no records within 5 km of the Project Area since 1995.
<i>Austrostipa gibbosa</i>	Swollen Spear-grass		R	2013	1		In SA grows in FR, NL, MU, SL and SE regions. Grows in rich loamy soils along creeks and in other seasonally wet places. Also prefers open forests and woodlands or grasslands with <i>Eucalyptus odorata</i> , <i>Acacia pycnantha</i> , <i>Allocasuarina verticillata</i> and <i>Rhytidosperma setaceum</i> .	Unlikely.  Soils throughout the Project Area are clay and unsuitable for the species.
<i>Austrostipa multispiculis</i>	Many-flowered Spear-grass		R	1995	1		SA: NL MU SL KI. Grows in open grassland with <i>Austrostipa nodosa</i> , <i>A. eremophila</i> and <i>Rhytidosperma setaceum</i> and <i>Aristida sp.</i>	Likely in VA2 and VA8.  Although not recorded within 5 km since 1995, all grasslands in the Project Area provide suitable habitat.
<i>Austrostipa petraea</i>	Flinders Range Spear-grass		R	1993	1		In SA, occurs in FR, EA, EP and NL regions. It has been recorded from rich soils but mainly in rocky places including limestone.	Likely in VA2 and VA8.  Although not recorded within 5 km since 1995, all grasslands in the Project Area provide suitable habitat.

<i>Austrostipa pilata</i>	Prickly Spear-grass		V	2003	1		SA: FR NL MU. Known from 6 localities ranging from northern FR to Monarto. Prefers Mallee vegetation, hillslopes, sandy loam to clay loam soils. <i>Eucalyptus socialis</i> , <i>Callitris glaucophylla</i> , <i>E. intertexta</i> , <i>Atriplex vesicaria</i> , <i>Rhytidosperma caespitosum</i> and <i>Triodia irritans</i> .	Unlikely.  There are no mallee habitats in the Project Area.
<i>Bothriochloa macra</i>	Red-leg Grass		R	2000	1		SA: FR EA EP NL MU YP SL SE. Eastern States of Australia. Grows on a variety of soil types in humid areas but in drier areas is restricted to run-on areas on clay or loamy soils. Occurs on most soil types but often dominant on poor, lower fertility soils and frequently invades degraded areas. Scattered recent records within southern EP. Mainly found in open grassy woodland communities and is often found in disturbed sites.	Possible in VA6, VA10 and VA24.  Habitat for the species is limited to woodland areas.
<i>Caladenia gladiolata</i>	Bayonet Spider-orchid	EN	E	1981	1		Endemic to SA. Emerges in winter and produces a single flower stem in Aug-Sep. Grows in woodland dominated by South Australian Blue Gum ( <i>Eucalyptus leucoxyton</i> ), Sugar Gum ( <i>E. cladocalyx</i> ) or Pink Gum ( <i>E. fasciculosa</i> ). Grows on moderate to steep slopes in sandy loam soils with scattered shale and quartzite.	Unlikely.  No records since 1995 and no suitable sandy loam soils in the Project Area.
<i>Caladenia tensa</i>	Inland Green-comb Spider-orchid	EN		2007	1, 2	Known to occur	Various habitats have been described including Cypress Pine / Yellow Gum Woodland, Pine / Box woodland, mallee-heath sites, healthy woodland and mallee woodland, generally with rock outcrops. Flowering in spring (September - October).	Possible in VA6, VA10 and VA24.  Recent records from within 5 km, but very limited woodland habitat in the Project Area.

<i>Centrolepis cephaliformis</i> ssp. <i>cephaliformis</i>	Cushion Centrolepis		R	1992	1		In mallee and disturbed communities on sand and other infertile soils, also on the margins of clay pans and salt marshes. SA: FR EP NL MU YP SL SE.	Unlikely. There are no suitable sandy soils, clay pans or salt lakes in the Project Area.
<i>Codonocarpus pyramidalis</i>	Slender Bell-fruit	VU	E	2013	1, 2	Known to occur	Occurs as scattered individuals across areas of the Flinders Ranges, Northern Lofty Ranges and the eastern regions of SA such as within the Murray Darling Basin, Eyre Peninsula, Yorke and Adelaide. Grows along the crests of hills and ridges, slopes and along creeks, where the soil is either a loamy sand or sandy clay loam and where the pH is between 8.5–9. Throughout its range it is never common and only scattered trees are to be found.	Possible in all vegetation associations. Recent records indicate that the species might occur in the Project Area, however areas of suitable soil are limited.
<i>Crassula peduncularis</i>	Purple Crassula		R	1999	1		Grows in marshy areas which are rarely flooded; occurring mainly in south-eastern Australia. SA: FR, EP, NL, MU, SL, KI, SE. A few scattered records from southern WA; north-eastern N.S.W.; Tas. New Zealand; South America.	Unlikely. There are no swamp or marshy areas impacted by the Project.
<i>Crassula sieberiana</i>	Sieber's Crassula		E	2009	1		In SA, the majority of the distribution is confined within the AMLR, disjunct from the remaining extant distribution in other States. Listed as occurring in <i>Eucalyptus odorata</i> grassy woodland. Also grows in semi-arid areas, especially in sand. Within the AMLR the preferred broad vegetation groups are Riparian, Grassy Woodland and Wetland.	Unlikely. The Project Area contains no wetland or sandy habitats.



<i>Cryptandra campanulata</i>	Long-flower Cryptandra		R	2019	1		Occurs in the FR, EA, NL and MU regions of SA. This species grows in shallow soils over rocks such as quartzite, granite, sandstone, limestone or shale, in the southern Flinders Ranges and northern Mt Lofty Ranges. <i>Cryptandra campanulata</i> is the most frequently encountered woody species in iron-grass grasslands (Turner 2012); it also occurs in heath and shrubland vegetation.	Known in VA8 and VA24.
<i>Cullen parvum</i>	Small Scurf-pea		V	2010	1		SA: FR EA NL MU SL. Generally associated with alluvial plains, creeks, ephemeral pools and river channels. It has also been reported from artificial drains and other disturbed sites. It grows in grassy woodland or open forest vegetation dominated by species of <i>Eucalyptus</i> , or in grasslands. Known from grasslands and grassy woodlands. Considered almost extinct in this region.	Unlikely.  Although grasslands and grassy woodlands occur in the Project Area, they do not contain other habitat elements required by the species, such as alluvial plains, creek channels or pools.
<i>Daviesia benthamii</i> ssp. <i>humilis</i> (NC)	Mallee Bitter-pea		R	2003	1		Known from across SA's southern flora regions, on deep sands of sand dunes and sand plains in association with Mallee/Spinifex communities. Habitat preferences include Mallee associations with <i>Eucalyptus phenax</i> ssp. <i>phenax</i> (White Mallee) Low Mallee over <i>Melaleuca uncinata</i> (Broombush), <i>Eucalyptus incassata</i> (Ridge-fruited Mallee), Low Mallee and <i>Eucalyptus oleosa</i> (Red Mallee) / <i>Eucalyptus brachycalyx</i> (Gilja) Mallee.   Scattered through mallee districts of SA, Vic and NSW from EP in the west to Wyalong in east. Grows on a variety of soils including skeletal on mountain	Unlikely.  The Project Area does not contain any associated vegetation communities or deep sand soils.

							slopes, sandy loam over limestone and gravelly clay, typically in mallee dominated by shrubby <i>Eucalyptus</i> sp.	
<i>Daviesia schwarzenegger</i>	Mallee Bitter-pea		R*	2005	1		Found in the southern Flinders Ranges and the Mid-north in South Australia, growing in drier sites dominated by mallee eucalyptus on clay soils. Also found in New South Wales and Victoria	Possible in VA6.  Although there are recent records near the Project Area, habitat is very limited to <i>Eucalyptus</i> woodland areas.
<i>Dianella longifolia</i> var. <i>grandis</i>	Pale Flax-lily		R	2013	1		Records mainly from the ranges. Occurs under a variety of overstorey <i>Eucalyptus</i> species but is a grassy woodland specialist, e.g., Blue Gum, Candlebark, Manna Gum, Stringybark and Grey Box.	Possible in VA6.  Although there are recent records near the Project Area, habitat is very limited to <i>Eucalyptus</i> woodland areas.
<i>Diuris behrii</i>	Behr's Cowslip Orchid		V	2013	1		Mostly in native grassland, open woodland and grassy forest clearings in more fertile soils, especially amongst kangaroo grass and <i>Triodia</i> on gentle slopes and flats.	Possible in VA2 and VA8.  Not recorded in extensive flora surveys of <i>Lomandra</i> spp. grasslands in the Project Area, however the plant would be difficult to find outside of flowering season. Recent records nearby suggest that the species is possible despite survey results.

<i>Dodonaea procumbens</i>	Trailing Hop-bush	VU	V	2018	1, 3	Known to occur	Endemic to south-eastern Australia, occurring in about 55 wild populations. In SA the species occurs near Port Lincoln, near Clare and Burra in the northern Mt Lofty Ranges, on Kangaroo Island and near Penola in the SE. <i>Dodonaea procumbens</i> grows in low-lying, often winter-wet areas in woodland, low open forests, heathland and grasslands, on sands and clays, with SA populations recorded in open <i>Eucalyptus camaldulensis</i> , <i>E. fasciculosa</i> and <i>E. leucoxyton</i> woodlands in low-lying areas, and in <i>Lepidosperma viscidum</i> , <i>Themeda triandra</i> , <i>Rhytidosperma spp.</i> , <i>Austrostipa spp.</i> native grasslands, and shrubs including <i>Acacia acinacea</i> , <i>D. viscosa</i> and <i>Bursaria spinosa</i> . On KI and near Penola, the species grows in <i>Eucalyptus baxteri</i> open forest, sometimes in <i>Xanthorrhoea</i> thickets.	Known in VA2.
<i>Dodonaea subglandulifera</i>	Peep Hill Hop-bush	EN	E	2012	1, 2	Known to occur	Populations primarily occur on low hills on loamy soils associated with rocky (limestone, slate, shale) outcrops. The species has also been recorded from plains country in sandy soils over limestone.	Likely in all vegetation associations. Known from nearby areas. Not recorded during field surveys in the Project Area, but may occur in unsurveyed vegetation.
<i>Echinopogon ovatus</i>	Rough-beard Grass		R	2008	1		Grows in the shade.	Likely in all vegetation associations. Little habitat information, with recent records within 5 km of the Project Area. Not recorded by field surveys.
<i>Elatine gratioloides</i>	Waterwort		R	2005	1		Aquatic annual found growing in or on the margins of stationary or	Unlikely. No aquatic habitat.

							slow-flowing water to 40 cm deep.	
<i>Eragrostis infecunda</i>	Barren Cane-grass		R	2005	1		Occurs on seasonally wet, heavy soils and clays on river floodplains and shallow lakes.	Unlikely. There are no river floodplains or seasonal lakes in the Project Area.
<i>Eryngium ovinum</i>	Blue Devil		V	2019	1, 4		Widespread, chiefly in inland districts. Grows in damp clayey or sandy soils of open woodland and disturbed roadside sites and pastures.	Known in VA2 and VA8.
<i>Eryngium vesiculosum</i>	Prostrate Blue Devil		R	2021	1		Mainly in sandy flats, often near the sea.	Unlikely. There are no sandy flats in the Project Area.
<i>Eucalyptus cajuputea</i>	Green Mallee		R	2003	1		Widespread but localized, in mallee shrubland on shallow light soils on rocky rises.	Unlikely. There is no mallee vegetation in the Project Area and the species was not recorded despite surveying all woodland areas.
<i>Eucalyptus percostata</i>	Ribbed White Mallee		R	1994	1		Occurs between Quorn and Napperby in mallee on the slopes and foots of rocky hills.	Unlikely. The Project Area is outside the distribution extent of the species.
<i>Festuca benthamiana</i>	Bentham's Fescue		R	1988	1		Dryish upland sites.	Possible in all vegetation associations. Habitat information is scarce, and there are records of the species within the last 40 years.
<i>Goodenia heteromera</i>	Spreading Goodenia		R	1996	1		On periodically flooded river banks and flats.	Unlikely. There are no periodically flooded river banks in the vegetation being impacted.
<i>Juncus australis</i>	Austral Rush		R	2004	1		Grows in wet or seasonally wet grassland often in the shade.	Unlikely. Grasslands in the Project Area occur on hill slopes and ridge tops in dryer locations.

<i>Juncus radula</i>	Hoary Rush		V	1997	1		Grows in seasonally wet places in climatically rather dry regions.	Unlikely. Grasslands in the Project Area occur on hill slopes and ridge tops in dryer locations.
<i>Lachnagrostis limitanea</i>	Spalding Blown-grass	EN	E	2005	1, 2	Known to occur	Endemic to the Northern Lofty Ranges Region of SA. Occurs in low-lying, flood-prone clay loam near watercourses in the Northern Lofty Flora Region of SA. The associated native vegetation is open sedgeland with <i>Juncus kraussii</i> and sedges over low-growing native herbaceous species, including: <i>Sarcocornia quinqueflora</i> , <i>Distichlis distichophylla</i> and <i>Samolus repens</i> .	Unlikely. There are no flood-prone areas or sedgeland vegetation associations in the project Area.
<i>Lachnagrostis robusta</i>	Tall Blown-grass		R	2008	1		Occurs around margins of salt lakes and in saline depressions.	Unlikely. There are no salt lakes in the Project Area.
<i>Lepidium pseudotasmanicum</i>	Shade Peppercross		V	1997	1		Previously recorded in <i>Cassinia complanata</i> , <i>Dodonaea angustissima</i> , <i>Rhagodia parabolica</i> , <i>Olearia decurrens</i> low shrubland over <i>Einadia nutans</i> , <i>Oxalis perennans</i> , <i>Danthonia</i> sp., and a range of exotic grasses and herbs. In dark brown loams (dry). In quartzite rocks.	Unlikely. There are no suitable shrubland habitats in the Project Area.
<i>Leptorhynchos elongatus</i>	Lanky Buttons		E	2003	1		Prefers sandy and sandy loam soils in woodlands and grasslands.	Unlikely. Soils of the Project Area are clays and clay-loams.
<i>Leptorhynchos orientalis</i>	Eastern Annual Buttons		R	1938	1		Presumed extinct in the Mount Lofty Ranges and now only known on the Eyre Peninsula in South Australia.	Unlikely. The Project Area is outside the known distribution of the species.

<i>Lobelia concolor</i>	Poison Pratia		R	1993	1		Usually in heavy soil in moist depressions or sometimes associated with irrigated pastures.	Unlikely. The project avoids wet depression areas.
<i>Logania saxatilis</i>	Rock Logania		R	2008	1		Steep-sided sandstone gorges in open woodland and in crevices in rocky outcrops.	Possible in VA10 and VA24. Recent records nearby, however habitat is very limited to small patches of VA10 and VA24.
<i>Maireana excavata</i>	Bottle Fissure-plant		V	2019	1		Occurs in native grasslands of the arid regions in shallow soils.	Highly likely in VA2 and VA8. Recent records nearby and extensive suitable habitat in the Project Area.
<i>Maireana rohrlachii</i>	Rohrlach's Bluebush		R	2014	1, 3, 4		Species occurs from few locations on EP, but mainly YP, Mid North, Fleurieu Peninsula, Murray lands and western Victoria. Preferred habitat includes heavy clay and calcareous loams with <i>Geijera linearifolia</i> (Sheep Bush) Very Open Shrubland, <i>Eremophila scoparia</i> (Silvery Emubush) low open shrubland. In Victoria it is found on saline or sandy loam soils rich in gypsum, often fringing lakes and in seasonally wet areas.	Known in VA2 and VA8.
<i>Mentha satereioides</i>	Native Pennyroyal		R	2001	1		Grows in sandy-clay to clay-rich soils, frequently in grassy areas and in open woodland communities.	Known in VA8.
<i>Montia australasica</i>	White Purslane		R	1993	1		Grows in moist areas including swamps and running water where the leaves reach their greatest lengths.	Unlikely. There are no swamps or aquatic habitats in the Project Area.

<i>Myoporum parvifolium</i>	Creeping Boobiella		R	2008	1		Subpopulations scattered throughout the EP and also throughout southern SA and Vic. Occurs in sandy coastal areas, Red Gum woodlands, <i>Melaleuca halmaturorum</i> (Swamp Teatree) Very Low Open Forests and dune swales.	Unlikely. No suitable habitat in the Project Area.
<i>Olearia pannosa ssp. pannosa</i>	Silver Daisy-bush	VU	V	2003	1	Known to occur	Endemic to SA where it is scattered throughout agricultural areas. Collections have been made in the EP, YP, FR, Southern MLR, Northern MLR, Murray Basin and SE botanical districts and a single collection from KI. Is generally found in sandy, flat areas and in hilly, rocky areas in woodland or mallee communities dominated by a wide range of <i>Eucalypt</i> , <i>Melaleuca</i> and <i>Callitris</i> species.	Possible in VA6 and VA10. Recorded near the Project Area by EBS Ecology, but suitable habitat is very limited within VA6 and VA10.
<i>Olearia picridifolia</i>	Rasp Daisy-bush		R	2003	1		Mainly associated with limestone. In mallee and heath communities.	Unlikely. There are no Mallee over limestone habitats in the project Area.
<i>Phebalium glandulosum ssp. macrocalyx</i>	Glandular Phebalium		E*	1981	1		Occurs mainly on sandy soils supporting heathland and mallee.	Unlikely. No suitable habitat in the Project Area.
<i>Philotheca angustifolia ssp. angustifolia</i>	Narrow-leaf Wax-flower		R	2008	1		Mallee on sandy soils.	Unlikely. No suitable habitat in the Project Area.
<i>Philotheca verrucosa</i>	Bendigo Wax-flower		V	2009	1		SA: NL. Occurs naturally on poor stony ground and on dry hills.	Known in VA10.

<i>Phlegmatospermum eremaeum</i>	Spreading Cress		R	2010	1		Annual herb growing in semi-arid regions. Occurs in mallee on calcareous clay or loam.	Unlikely. No suitable habitat in the Project Area.
<i>Podolepis decipiens</i>	Bright Podolepis		R*	1981	1		In woodland, mallee, heath and more arid vegetation types.	Unlikely. Suitable habitat is very limited and there have been no records of the species nearby within the past 20 years.
<i>Podolepis jaceoides</i>	Showy Copper-wire Daisy		R	1981	1		Occurs in grassland, woodland and mallee, typically on soils of higher nutrient status.	Possible. Habitat throughout the Project Area is broadly suitable, however there have been no recent records in the past 20 years.
<i>Podolepis muelleri</i>	Button Podolepis		V	1992	1		Occurs on coastal cliffs and on stony sites further inland.	Possible. Habitat throughout the Project Area is broadly suitable, however there have been no recent records in the past 20 years.
<i>Prasophyllum pallidum</i>	Pale Leek-orchid	VU			2	May occur	Pale Leek-orchid is known singly or in groups in better soils of woodland and grassy open forest from the Flinders Ranges to the Northern and Southern Lofty regions of SA. Recorded in woodlands and forests dominated by <i>Eucalyptus leucoxylon</i> , <i>E. goniocalyx</i> , <i>E. fasciculosa</i> , <i>E. microcarpa</i> , <i>Callitris gracilis/Eucalyptus fasciculosa</i> , and <i>Allocasuarina verticillata</i> over <i>Lissanthe strigosa</i> , <i>Amphipogon strictus</i> and <i>Tricoryne elatior</i> .	Unlikely. There are no records of the species within 5 km of the Project Area and potential habitat is very limited.



<i>Ptilotus angustifolius</i>	Narrow-leaf Yellow-tails (or Regal Fox Tails?)		E	1994	1		Endemic to South Australia and from near Quorn, north-east of Port Augusta, south to Victor Harbor, growing on rocky slopes or hills, occurring in <i>Eucalyptus microcarpa</i> associations.	Unlikely. <i>Eucalyptus microcarpa</i> associations do not occur in the Project Area.
<i>Ptilotus erubescens</i>	Hairy-tails		R	2019	1		SA: FR NL MU SL SE. Grassy Woodlands, scrublands.	Known in VA2 and VA8.
<i>Pultenaea kraehenbuehlii</i>	Tothill Bush-pea		R	2009	1		Endemic to the Northern Mount Lofty Ranges in SA. It is confined to a narrow range of habitats on the upper rocky slopes of Tothill Range and one small outlying hill.	Known in VA10 and VA24.
<i>Rumex dumosus</i>	Wiry Dock		R	2019	1, 4, 5		Grows in damp areas associated with mallee.	Known in VA24.
<i>Rytidosperma laeve</i>	Smooth Wallaby-grass		R	2003	1		Ecologically variable, from alpine moorland to open grassland or light woodland, often in seasonally damp habitats.	Likely in all vegetation associations.  Little habitat information, with recent records within 5 km of the Project Area. Not recorded by field surveys.
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass		R	2013	1, 6		Grows in altitudes between 5–750 m, on Tablelands usually in somewhat damp habitats, rarely dominant; along the coastal shelf a very common constituent of disturbed road verges.	Known in VA2 and VA8
<i>Sclerolaena muricata</i> <i>var. villosa</i>	Five-spine Bindyi		R	2003	1		Usually on heavier soils. Often in disturbed areas.	Likely in VA2 and VA8.  Limited habitat information and recent records nearby.

<i>Senecio megaglossus</i>	Large-flower Groundsel	VU	E	1993	1, 2	Likely to occur	Endemic to SA where it is Confined to the Northern Mt Lofty Ranges and Southern Flinders Ranges of SA. Found in rocky creek banks and rocky gorge/valley slopes but also in sandhills. Associated with herb lands or grassland with <i>Lomandra effusa</i> , <i>Triodia irritans</i> or <i>Austrostipa</i> sp.; tall open-shrubland with <i>Pittosporum angustifolium</i> , <i>Alectryon oleifolius</i> , <i>Cassinia laevis</i> , <i>Eremophila longifolia</i> , <i>Acacia calamifolia</i> and <i>Bursaria spinosa</i> and <i>Triodia irritans</i> and <i>Eucalyptus camaldulensis</i> woodlands.	Possible in VA2 and VA8.  Records within 20 years, however extensive surveys of suitable habitat have not detected the species.
<i>Swainsona behriana</i>	Behr's Swainson-pea		V	2013	1		Mostly grows in light soils in moist grassland especially in woodland and forest clearings.	Unlikely.  The Project Area is characterised by heavy soils.
<i>Swainsona pyrophila</i>	Yellow Swainson-pea	VU			2	Likely to occur	Known from SA, NSW and Vic. Found in Mallee vegetation communities on a variety of soil types including well-drained sands, sandy loams and heavier clay loams. It is usually found after fire growing in association with <i>Eucalyptus incrassata</i> (Ridge-fruited Mallee), <i>E. socialis</i> (Beaked Red Mallee), <i>E. brachycalyx</i> (Gilja), <i>E. gracilis</i> (Yorrell), and <i>E. oleosa</i> (Red Mallee) mid mallee woodland over <i>Melaleuca uncinata</i> (Broombush) tall shrubland.	Unlikely.  There are no records of the species within 5 km and the habitat is unsuitable.
<i>Thelymitra aristata</i>	Great Sun-orchid		E*	2008	1		Found in the south-east in South Australia, north of Mt Gambier, growing in clay or gravel soils in forest or scrubland around swamp margins in damp sands.	Unlikely.  Recent records nearby, but no suitable forest habitat.

<i>Thelymitra carnea</i>	Small Pink Sun-orchid		R	1982	1		Occurs singly or in small groups in soil which is boggy in winter but dries hard in summer, usually in open clearings in light scrubland. Rare in this State and usually found with <i>T. flexuosa</i> and <i>T. rubra</i> .	Unlikely. No records in the past 20 years and no suitable habitat in the Project Area.
<i>Thelymitra grandiflora</i>	Great Sun-orchid		R	2011	1		Occurs singly or as small clumps of plants in forest clearings, woodland and scrub in well drained gravelly clay soils which may be laterite or podosols, or mixed with sand, extending to dry rocky ridges in better soils.	Unlikely. Recent records nearby, but no suitable forest habitat.
<i>Thysanotus tenellus</i>	Grassy Fringe-lily		R	2008	1		In SA, the species prefers <i>Eucalyptus</i> woodlands, <i>Lomandra effusa</i> Open Grasslands, <i>Dodonaea lobulata</i> shrublands and Bluebush shrublands.	Likely in VA2 and VA6. Recent records nearby, with suitable habitat in VA2 and VA6.

EPBC Act; Ex = Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable

NPW Act; E = Endangered, V = Vulnerable, R = Rare

Source; 1 = BDBSA, 2 = Protected Matters Search Tool, 3 = EBS Ecology 2020, 4 = EBS Ecology 2021b, 5 = This survey, 6 = EBS Ecology 2008a



## Appendix 4. Fauna species recorded in the Project Area during this and previous field surveys.

CLASS	Scientific Name	Common Name	Status		Recorded during this survey
			EPBC Act	NPW Act	
AMPHIBIA	<i>Crinia signifera</i>	Common Froglet			
AVES	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater			
AVES	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill			Yes
AVES	<i>Acanthiza nana</i>	Yellow Thornbill			
AVES	<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill			
AVES	<i>Accipiter cirrocephalus cirrocephalus</i>	Collared Sparrowhawk			
AVES	<i>Accipiter fasciatus</i>	Brown Goshawk			
AVES	<i>Acrocephalus australis</i>	Australian Reed-Warbler			
AVES	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar			
AVES	<i>Alauda arvensis</i>	Eurasian Skylark			Yes
AVES	<i>Anas gracilis</i> <sup>^</sup>	Grey Teal			
AVES	<i>Anas superciliosa</i>	Pacific Black Duck			
AVES	<i>Anthochaera carunculata</i>	Red Wattlebird			
AVES	<i>Anthus australis</i>	Australian Pipit			
AVES	<i>Aphelocephala leucopsis</i>	Southern Whiteface			
AVES	<i>Aquila audax</i>	Wedge-tailed Eagle			Yes
AVES	<i>Artamus cyanopterus</i>	Dusky Woodswallow			
AVES	<i>Barnardius zonarius barnardi</i>	Mallee Ringneck			
AVES	<i>Chenonetta jubata</i> <sup>^</sup>	Maned Duck			
AVES	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo			Yes
AVES	<i>Cincloramphus cruralis</i>	Brown Songlark			Yes
AVES	<i>Circus assimilis</i>	Spotted Harrier			Yes
AVES	<i>Climacteris picumnus</i>	Brown Treecreeper			
AVES	<i>Colluricincla harmonica</i>	Grey Shrike-thrush			Yes
AVES	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike			
AVES	<i>Corcorax melanorhamphos</i>	White-winged Chough		R	Yes
AVES	<i>Corvus coronoides</i>	Australian Raven			
AVES	<i>Corvus mellori</i>	Little Raven			Yes
AVES	<i>Corvus sp.</i>				
AVES	<i>Coturnix pectoralis</i>	Stubble Quail			Yes
AVES	<i>Cracticus torquatus</i>	Grey Butcherbird			
AVES	<i>Dacelo novaeguineae</i>	Laughing Kookaburra			
AVES	<i>Daphoenositta chrysoptera</i>	Varied Sittella			
AVES	<i>Dicaeum hirundinaceum</i> <sup>^</sup>	Mistletoebird			
AVES	<i>Dromaius novaehollandiae</i>	Emu			
AVES	<i>Egretta novaehollandiae</i>	White-faced Heron			
AVES	<i>Elanus axillaris</i>	Black-shouldered Kite			
AVES	<i>Elsayornis melanops</i>	Black-fronted Dotterel			
AVES	<i>Eolophus roseicapilla</i>	Galah			Yes
AVES	<i>Epthianura albifrons</i>	White-fronted Chat			Yes
AVES	<i>Epthianura aurifrons</i>	Orange Chat			
AVES	<i>Epthianura tricolor</i>	Crimson Chat			
AVES	<i>Falco berigora</i>	Brown Falcon			Yes
AVES	<i>Falco cenchroides</i>	Nankeen Kestrel			
AVES	<i>Falco peregrinus</i>	Peregrine Falcon		R	
AVES	<i>Gavicalis virescens</i>	Singing Honeyeater			
AVES	<i>Geopelia placida</i> <sup>^</sup>	Peaceful Dove			
AVES	<i>Grallina cyanoleuca</i>	Magpielark			
AVES	<i>Gymnorhina tibicen</i>	Australian Magpie			Yes

CLASS	Scientific Name	Common Name	Status		Recorded during this survey
			EPBC Act	NPW Act	
AVES	<i>Hirundo neoxena</i>	Welcome Swallow			
AVES	<i>Lichenostomus ornatus</i>	Yellow-plumed Honeyeater			
AVES	<i>Lichenostomus virescens</i>	Singing Honeyeater			
AVES	<i>Malurus lamberti</i>	Variiegated Fairywren			
AVES	<i>Malurus splendens</i>	Splendid Fairy-wren			
AVES	<i>Manorina flavigula</i>	Yellow-throated Miner			
AVES	<i>Megalurus gramineus</i>	Little Grassbird			
AVES	<i>Melanodryas cucullata cucullata</i>	Hooded Robin		R	
AVES	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater			
AVES	<i>Microcarbo melanoleucos melanoleucos</i>	Little Pied Cormorant			
AVES	<i>Microeca fascinans fascinans</i>	Jacky Winter			
AVES	<i>Myiagra cyanoleuca</i>	Satin Flycatcher		E	
AVES	<i>Myiagra inquieta</i>	Restless Flycatcher		R	
AVES	<i>Neophema elegans</i>	Elegant Parrot		R	
AVES	<i>Nesoptilotis leucotis</i>	White-eared Honeyeater			
AVES	<i>Ninox novaeseelandiae</i>	Southern Boobook			
AVES	<i>Nymphicus hollandicus</i>	Cockatiel			
AVES	<i>Ocyphaps lophotes</i>	Crested Pigeon			
AVES	<i>Pachycephala pectoralis</i>	Golden Whistler			
AVES	<i>Pachycephala rufiventris</i>	Rufous Whistler			
AVES	<i>Pardalotus punctatus</i>	Spotted Pardalote			
AVES	<i>Pardalotus striatus</i>	Striated Pardalote			
AVES	<i>Passer domesticus*</i>	House Sparrow			
AVES	<i>Petrochelidon nigricans</i>	Tree Martin			
AVES	<i>Petroica goodenovii</i>	Red-capped Robin			
AVES	<i>Petroica phoenicea</i>	Flame Robin		V	
AVES	<i>Phalacrocorax varius</i>	Pied Cormorant			
AVES	<i>Phaps chalcoptera</i>	Common Bronzewing			
AVES	<i>Platycercus elegans</i>	Crimson Rosella			
AVES	<i>Platycercus eximius</i>	Eastern Rosella			
AVES	<i>Pomatostomus ruficeps^</i>	Chestnut-crowned Babbler			
AVES	<i>Pomatostomus superciliosus</i>	White-browed Babbler			
AVES	<i>Psephotellus varius^</i>	Mulga Parrot			
AVES	<i>Psephotus haematonotus</i>	Red-rumped Parrot			
AVES	<i>Ptilotula penicillata</i>	White-plumed Honeyeater			
AVES	<i>Pyrrholaemus brunneus</i>	Redthroat			
AVES	<i>Rhipidura albiscapa</i>	Grey Fantail			
AVES	<i>Rhipidura leucophrys</i>	Willie Wagtail			
AVES	<i>Smicromnis brevirostris</i>	Weebill			
AVES	<i>Stagonopleura guttata</i>	Diamond Firetail		V	
AVES	<i>Strepera versicolor</i>	Grey Currawong			
AVES	<i>Sturnus vulgaris*</i>	Common Starling			
AVES	<i>Tadorna tadornoides</i>	Australian Shelduck			
AVES	<i>Turdus merula</i>	Common Blackbird*			
AVES	<i>Vanellus miles</i>	Masked Lapwing			
AVES	<i>Vanellus tricolor</i>	Banded Lapwing			
MAMMALS	<i>Austronomus australis</i>	White-striped Freetail Bat			
MAMMALS	<i>Bos taurus*</i>	Cattle			Yes
MAMMALS	<i>Cervus dama*</i>	Fallow Deer			
MAMMALS	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat			
MAMMALS	<i>Chalinolobus morio</i>	Chocolate Wattled Bat			
MAMMALS	<i>Lasiorhinus latifrons</i>	Southern Hairy-nosed Wombat			Yes

CLASS	Scientific Name	Common Name	Status		Recorded during this survey
			EPBC Act	NPW Act	
MAMMALS	<i>Lepus europaeus*</i>	European Hare			
MAMMALS	<i>Macropus fuliginosus</i>	Western Grey Kangaroo			Yes
MAMMALS	<i>Macropus robustus</i>	Euro			Yes
MAMMALS	<i>Macropus rufus</i>	Red Kangaroo			
MAMMALS	<i>Mormopterus planiceps</i>	Southern Freetail Bat			
MAMMALS	<i>Mormopterus sp.</i>				
MAMMALS	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat			
MAMMALS	<i>Oryctolagus cuniculus*</i>	Rabbit (European Rabbit)			Yes
MAMMALS	<i>Ozimops sp.</i>	Free-tailed Bats			
MAMMALS	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat			
MAMMALS	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna			
MAMMALS	<i>Vespadelus darlingtoni</i>	Large Forest Bat			
MAMMALS	<i>Vespadelus regulus</i>	Southern Forest Bat			
MAMMALS	<i>Vespadelus sp.</i>				
MAMMALS	<i>Vulpes vulpes*</i>	Fox (Red Fox)			
REPTILES	<i>Ctenophorus decresii</i>	Tawny Dragon			
REPTILES	<i>Diplodactylus tessellatus</i>	Tessellated Gecko			
REPTILES	<i>Menetia greyii</i>	Common Dwarf Skink			
REPTILES	<i>Pseudonaja sp.</i>	Brown Snake			
REPTILES	<i>Tiliqua adelaidensis</i>	Pygmy Blue-tongue Lizard			
REPTILES	<i>Tiliqua rugosa</i>	Sleepy Lizard			Yes

## **Appendix 5. Bushland Assessment Scoresheets associated with the proposed clearance.**

Bushland Assessment Scoresheets are provided as electronic attachments.





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