

# Native Vegetation Clearance

## Morgan Whyalla Pipeline Stage 3

### Data Report

Clearance under the *Native Vegetation Regulations 2017*

January 2024

Prepared by Eco Logical Australia



## DOCUMENT TRACKING

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# Abbreviations

<b>Abbreviation</b>	<b>Description</b>
ARTC	Australian Rail Track Corporation
BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia
DAWE	Department of Agriculture, Water, and the Environment
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEW	Department for Environment and Water
DOE	Department of the Environment
EPBC	Environment Protection and Biodiversity Conservation
GPS	Global Positioning System
IBRA	Interim Bioregionalisation of Australia
LSA	Landscape South Australia
MNES	Matters of National Environmental Significance
MSCL	Mild Steel Concrete Lined Pipe
MWPL	Morgan Whyalla Pipeline
MWPL1	Morgan Whyalla Pipeline#1
NPW	National Parks and Wildlife Act
NRM	Natural Resource Management
NSW	New South Wales
NVC	Native Vegetation Council
OEH	Office of Environment and Heritage
PDI	Planning, Development, and Infrastructure
PMST	Protected Matters Search Tool
RAM	Rangeland Assessment Method
ROW	Right of Way
SA	South Australia
SAAL	South Australian Arid Lands Landscape Region
SAW	SA Water Corporation
SEB	Significant Environmental Benefit
SOP	Standard Operating Procedure
TBS	Total Biodiversity Score
TEC	Threatened Ecological Community
TFS	Threatened Fauna Score
UBS	Unit Biodiversity Score
VA	Vegetation Association
WAA	Water Affecting Activity



# 1. Application information

## Application Details

Applicant:	SA Water Corporation		
Key contact:	<div> <div></div> <div>(Environmental Impact Assessment Officer)</div> <div>E: <div></div> <a href="mailto: @sawater.com.au">@sawater.com.au</a></div> <div>M: <div></div></div> </div>		
Landowner:	Crown/ utility easement		
Site Address:	Various locations from Morgan to Whyalla, SA		
Local Government Area:	Whyalla	Hundred:	Cultana, Randell and out of hundreds
Title ID:	CT/6118/597, CT/6122/48 CT/6141/526, CL/6253/233 CR CL	Parcel ID: D29397 Q10	Sec: D52447 A61, D53708 A501, and D64114 Q86 DP A/Q FP A/Q

## Summary of proposed clearance


Table 1 Summary of proposed clearance

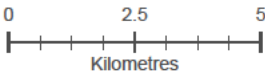
Purpose of clearance	Clearance is required to facilitate the renewal of the Morgan Whyalla pipeline which supplies water to Whyalla and areas further north and west. Section 2-5 for the project area is between land opposite the northern edge of the Whyalla golf course and extends 3.5 km north and parallel with the Lincoln Highway. Section 6 is approximately 34 km north northwest of Whyalla, adjacent the Lincoln Highway. The clearing is required as the current pipeline must be kept operational during the renewal process and then enough space to allow the decommissioning of the old pipeline. This will require a work corridor up to 25m wide.
Native Vegetation Regulation	Regulation 12. Schedule 1: Clause 34, Infrastructure
Description of the vegetation under application	<p>Six Vegetation associations:</p> <p>VA 1 - <i>Acacia papyrocarpa</i> low open woodland over chenopod shrubland</p> <p>VA 2 - <i>Atriplex vesicaria</i> low chenopod shrubland</p> <p>VA 3 - <i>Acacia papyrocarpa</i> very low open woodland</p> <p>VA 4: <i>Marieana brevifolia</i> (Short-leaf Bluebush), <i>Maireana sedifolia</i> (Pearly bluebush) and <i>Atriplex stipitata</i> (Bitter saltbush) low open chenopod shrubland</p> <p>VA 6: <i>Acacia papyrocarpa</i> (western myall) very open woodland over <i>Maireana brevifolia</i> (Short-leaf Bluebush) chenopod shrubland</p> <p>VA 7: – <i>Atriplex vesicaria</i> (Bladder Saltbush) low open chenopod Shrubland</p>
Total proposed clearance - area (ha) and number of trees	8.85 ha
Level of clearance	4
Overlay (Planning and Design Code)	N/A

Map of planned clearance	See Figure 2 and Figure 3
Mitigation hierarchy	<p>The mitigation hierarchy is addressed in detail in section 4.4. This project has been revised to reduce the impact of the proposed works and so further avoidance measures are not possible. Instead, minimization efforts will focus on:</p> <ul style="list-style-type: none"> <li>• The new pipeline is to be constructed as close to the existing pipeline as possible to make use of existing maintenance corridors, access tracks and roads, and to concentrate new disturbance where possible in areas that have been previously disturbed.</li> <li>• Laydown areas have been selected in areas with minimal vegetation/previously disturbed areas to minimise disturbance to good condition native vegetation.</li> <li>• All vegetation clearing works will be confined to the clearance areas identified in this report.</li> <li>• The width of the clearance area will be reduced at environmentally sensitive locations as identified through the use of alternate construction methods.</li> <li>• Branches of trees on the edge of the clearance area, but overhanging into construction / activity areas, will be trimmed as necessary by a qualified arborist to enable safe access.</li> <li>• Woody vegetation, trees, and hollows to be removed are to be inspected for fauna by a suitably qualified wildlife handler immediately prior to removal.</li> <li>• All vehicles and plant, including third parties, will be inspected and be free from plant material and weed propagules prior to arrival to the site.</li> </ul>
SEB Offset proposal	Payment of \$45,015.30



**Figure 1: Location of the study area**

-  Study area
-  Landscape Management Regions



Datum/Projection:  
GDA 1994 MGA Zone 53  
22ADL3518-OK Date: 20/12/2023





# 2. Purpose of clearance

## 2.1 Description

This application is for work needed to renew sections of the Morgan Whyalla Pipeline (MWPL) in a roughly 3 km section parallel to the Lincoln Highway heading north from Whyalla. Figure 1 shows the general location of the study area while Figure 2 shows the clearance area in more detail including the ecological features of the study area. The work may require an up to 25m wide corridor, but all effort will be made to minimize the vegetation disturbance during the renewal of this pipeline. This application also includes clearance required to extract and remove sections of the old pipeline once the renewal has been completed.

## Background

The Morgan Whyalla Pipeline (MWPL) No.1 was constructed during World War II (1941-1944). It sits parallel to the more recently built MWPL No.2 from Morgan to Baroota. From Baroota to Whyalla MWPL No.1 is the sole water supply to the north. The MWPL is used for the transfer of bulk supplies from the River Murray at Morgan to the Iron Triangle cities (Port Pirie, Port Augusta, and Whyalla) and to significant areas of the mid-north, Yorke Peninsula and Eyre Peninsula via an extensive distribution system.

Investigations have identified that several sections of the pipeline have very thin walls and these need to be renewed. The preferred alignment for the new pipeline is for it to run parallel to the existing main wherever possible. The design will aim to utilise the existing maintenance access track for install and decommissioning of the old pipeline wherever possible to minimise impacts to vegetation.

A vegetation assessment was carried on the sections identified for renewal by Greening Australia in 2020. Due to a change in scope new sections have been identified for renewal. An additional vegetation assessment was requested to provide the necessary information for a native vegetation clearance approval should the alignment encroach on vegetation within the construction footprint.

After a review of construction requirements, a 25 m (depending on the section to be renewed) wide construction corridor will be required. An additional 10-15 m will be required in sections where there is no existing access for the removal existing pipeline infrastructure.

## Additional Supporting Information

### Construction Requirements

McConnell Dowell Joint Venture (MDJV) have reviewed the scope of work associated with sections 2-5 and 6. Construction requirements within areas that will impact vegetation have been reviewed and refined to reduce direct impacts as much as possible. It was concluded that the construction corridor is already constrained due to the following construction elements that need to be factored in to allow for safe and feasible construction and operation of the pipeline asset.

### Existing Pipeline Offset

The new pipeline is to be offset six (6) metres to ensure that the structural integrity of the existing pipe and its foundations and the on-going operational/maintenance activities on the existing pipeline are not compromised during the construction of the new pipeline. This requirement has been driven by engineering design and was challenged during the design phase. Reducing this offset is not technically feasible and already carries risk to the integrity of the existing pipeline for larger excavations required as part of construction.

In section 5 the existing pipeline runs through an existing Australian Rail Track Corporation (ARTC) easement. Key consideration for vegetation through the section 5 alignment was given when formulating the construction requirements to manage Whyalla council's wishes alongside high value ecological vegetation. This option eliminates the current serviceability risk for SA Water and reduces vegetation impacts in this area as much as possible. Consideration was given to installing the pipe on the other side of the highway, however, there are high voltage

overhead power lines that run along the highway which posed a safety risk during construction and maintenance, as well as potential issues with stray currents through the steel pipeline.

### **Right of Way**

With the 6-metre offset, this only allows a 17 m for a Right of Way (ROW) for construction and machinery access (Figure 2 below). ROW requires sufficient width for a haul/access road to enable construction plant:

- To operate safely ensuring construction exclusion and safety/environmental buffer zones are maintained.
- Noting the corridor will be one way direction of travel due to presence of existing above ground pipeline along the full length of the corridor, thereby restricting vehicle/plant access and egress at existing road and track crossings (i.e., at pipeline gulleys (buried pipe sections).
- A minimum clear width of 3.4 m is required for the haul/access road to cater for construction plant and truck and trailer / semi-trailer material delivery trucks and floating plant, ensuring a safety buffer is maintained between travelling vehicles/plant and operating construction plant.
- 'String' pipe and material to minimise the number of vehicle movements through the ROW.

### **Preliminary site establishment**

- Survey and peg extent of ROW.
- Mulching of vegetation to provide clear corridor for construction works.
- Allowance of 1.0 m environmental buffer zone to ensure construction machinery/ equipment/ materials, spoil is contained within and does not encroach outside of approved 25 m (or otherwise approved width) environmental clearance zone.

### **Foundation & Concrete Structures construction (Above Ground Pipe Only)**

- Excavate intermediate foundation pads – 2.5 m (W) x 1.6 m (L) x 0.75 m (D).
- Excavate thrust block foundation pads and valve chambers – 7.0 m (W) x 8.0 m (L) x 1.2 m (D).
- A 1.5 m setback is required from excavation for excavator/plant. Therefore, effective width from centerline of new pipe to excavator tracks is 5.25 m. The setback is required to ensure the loads imposed by the excavator do not cause lateral pressure on the side of the excavation which would result in collapse of vertical face of excavation.
- Place pipe support chairs on pads.
- Requires 36 T excavator adjacent to pads and flatbed semi-trailer carrying pre-cast pipe support chairs to drive behind excavator for lifting off truck and slewing around onto foundation pad.

### **Pipe installation**

With the concrete support structures in place from the foundation setting stage, the allowable operational ROW becomes 17 m, to:

- Pipes awaiting permanent installation on pre-cast concrete supports will be temporarily strung out on the ground at a minimum set back of 3.5 m from the pipe installation corridor. (Pipes are 12.2 m long and weigh 3 T each).
- A 36 T excavator required to lift pipe to position on supports and prop pipes in place to facilitate welding. Note excavator requires sufficient slewing area, plus exclusion zone, while maintaining sufficient access for plant and vehicle access within ROW.
- The pipeline transitions to below ground (gulleys) at several locations. This is required to facilitate road crossings, property entrances etc. The depth of excavation for gulleys is typically 2.5 m deep. This requires:
  - Excavations to be benched for ground stability and construction safety.
  - Benching will typically require the excavation to be cut back 3-4 m from centerline of new pipe alignment.

In addition, a safety exclusion zone of 1.5 m from face of excavation is required to ensure that no plant or personnel are working within 1.5 m of the exposed edge of excavation. Therefore, the plant is required to be offset 3.5-4.5 m from the centerline of the pipe.

### **Pipe Excavation and installation (Underground)**

Excavation works will require the following:

- Removal of 150 mm of Topsoil which be wind rowed/ stockpiled for reinstatement.
- Excavate main trench, based on OD 610 Pipe at 1.8 m cover, the trench will be as follows - 1.8 m (W) x 100m (L) x 2.5 m (D).
- Excavate Weld pits at 12.2 m intervals for welding of pipe joints - 2.5 m (W) x 2.5 m (L) x 3 m (D). Total width of benched/battered pit is 8 m.
- Excavations to be benched for ground stability and construction safety.
- Benching will typically require the excavation to be cut back 3-4 m from centerline of new pipe alignment.
- In addition, a safety exclusion zone of 1.5 m from face of excavation is required to ensure that no plant or personnel are working within 1.5 m of the exposed edge of excavation. Therefore, the maximum excavation area to be considered is 11 m wide.
- An Ancillary ROW for material movement has been allowed for at 8 m wide, to:
- Dedicated 3.4 m Haul Road for spoil removal from ROW.
- Allowance for sufficient clearance between haul road and weld pit excavations

With the trench excavated, the allowable operational ROW becomes 17 m, to:

- Pipes awaiting permanent installation within trench will be temporarily strung out on the ground at a minimum set back of 1 m from the ROW fence.
  - A 25 T excavator is required to lift pipe into the trench and to facilitate welding. Note excavator requires sufficient slewing area, plus exclusion zone, while maintaining sufficient access for plant and vehicle access within ROW.
- Bedding sand will be installed into the trench via truck deliveries to the ROW as required which will be installed into the trench via a front-end loader and machined to the required thickness by a second 25 T Excavator.
- Once the pipe is installed, this process will repeat to complete backfill of the pipe. A combination of remote trench rollers, Excavator equipped with a compaction wheel and vibration rammers will be used to compact the trench to the required standard up to 150 mm below the finished surface level.
- Windrowed/stockpiled topsoil will be used to top up the trench and lightly compacted.

## Pipe Demolition

The existing pipeline varies in its proximity to the renewed sections. The allowable operational ROW for this operation is 19 m, to:

- Remove existing Mild Steel Cement Lined Pipe (MSCL) and process for removal offsite.
  - Pipes will be removed and processed using 2x 47 T Excavators with shears to separate the Steel and concrete components for separate processing. The pipework will be stockpiled at a minimum set back of 3.5 m from the pipe removal corridor during the shift due to constraints within the ROW and transported separately. Note excavator requires sufficient slewing area, plus exclusion zone, while maintaining sufficient access for plant and vehicle access within ROW.
  - Concrete skip bins will be mobilised to the ROW to collect concrete waste.
  - The pipeline also has underground gullets at various locations. These will need to be grout filled to ensure compliance with SA Water Standards. This Requires:
    - 750 m gullet through ARTC corridor will need fill points and air release points excavated at 6 locations this requires:
      - These points will need the pipework to be excavated within a 12 m x 12 m construction area.
      - Excavations to be benched for ground stability and construction safety.
      - Benching will typically require the excavation to be cut back 3-4 m from centerline of new pipe alignment.
      - Line Pump and concrete truck stationed on existing track to minimise corridor required.
  - Whyalla Steel Works Entry Gullet, requires fill points and air release points at either end, this will involve:
    - These points will need the pipework to be excavated within a 12 m x 12 m construction area.
    - Excavations to be benched for ground stability and construction safety.
    - Benching will typically require the excavation to be cut back 3-4 m from centerline of new pipe alignment.

- Line Pump and concrete truck stationed on existing track/road to minimise corridor required.

### **Steel Works Underbore and Off-takes**

Several water connections need to be relocated to the new main. This will be accomplished through installation of a DN300 branch, and construction of an above ground meter manifold for connection by the relevant stakeholder.

An Underbore will be completed under the ARTC corridor to connect this area to the new main. This requires:

- 25 m W x 50 m L entry shaft, this corridor allows for:
- This shaft will facilitate the tunnelling operation. This will involve tunnelling, spoil disposal via articulated trucks and insertion of pipework including welding.
- Excavations to be benched for ground stability and construction safety.
- Benching will typically require the excavation to be cut back 3-4 m from centerline of new pipe alignment.
- 25 m W x 17 m L Exit Pit
- Excavations to be benched for ground stability and construction safety.
- Benching will typically require the excavation to be cut back 3-4 m from centerline of new pipe alignment.

### **Tie-in and commissioning**

As the renewal of the existing MWPL 1 is a staged approach (dependent on securing funding for future staging of the renewal), tie-in points are required to join the existing pipeline to the new pipeline. Therefore, pipe spools/doglegs (which are not straight lengths of pipe) will be required to be placed adjacent to the pipeline alignment.

Requirements for these areas are in-line with what is stipulated for pipe installation above.

### **Reinstatement**

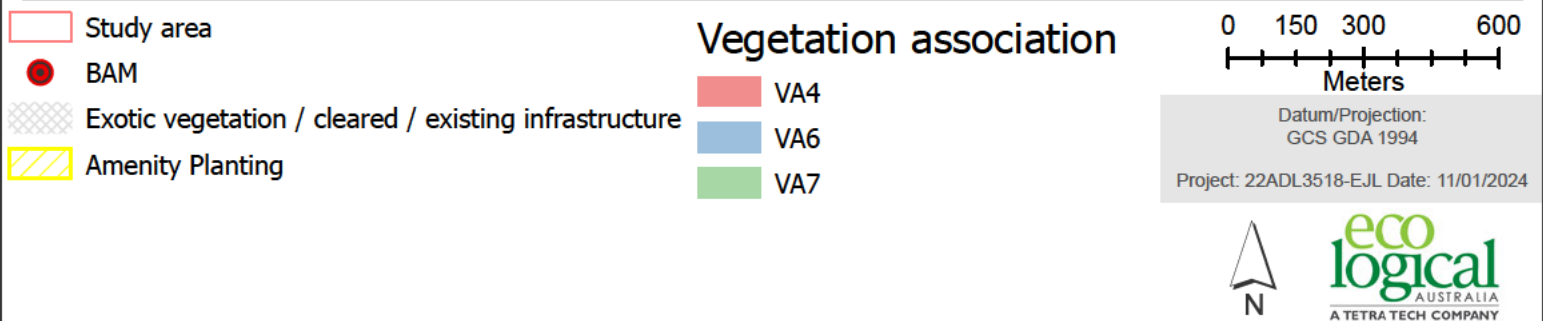
Reinstatement of disturbed areas to allow for regeneration in line with approval requirements (vegetation clearance).

- Machinery access to allow for ripping of compacted ground, respreading of topsoil, and seeding/planting (where required).

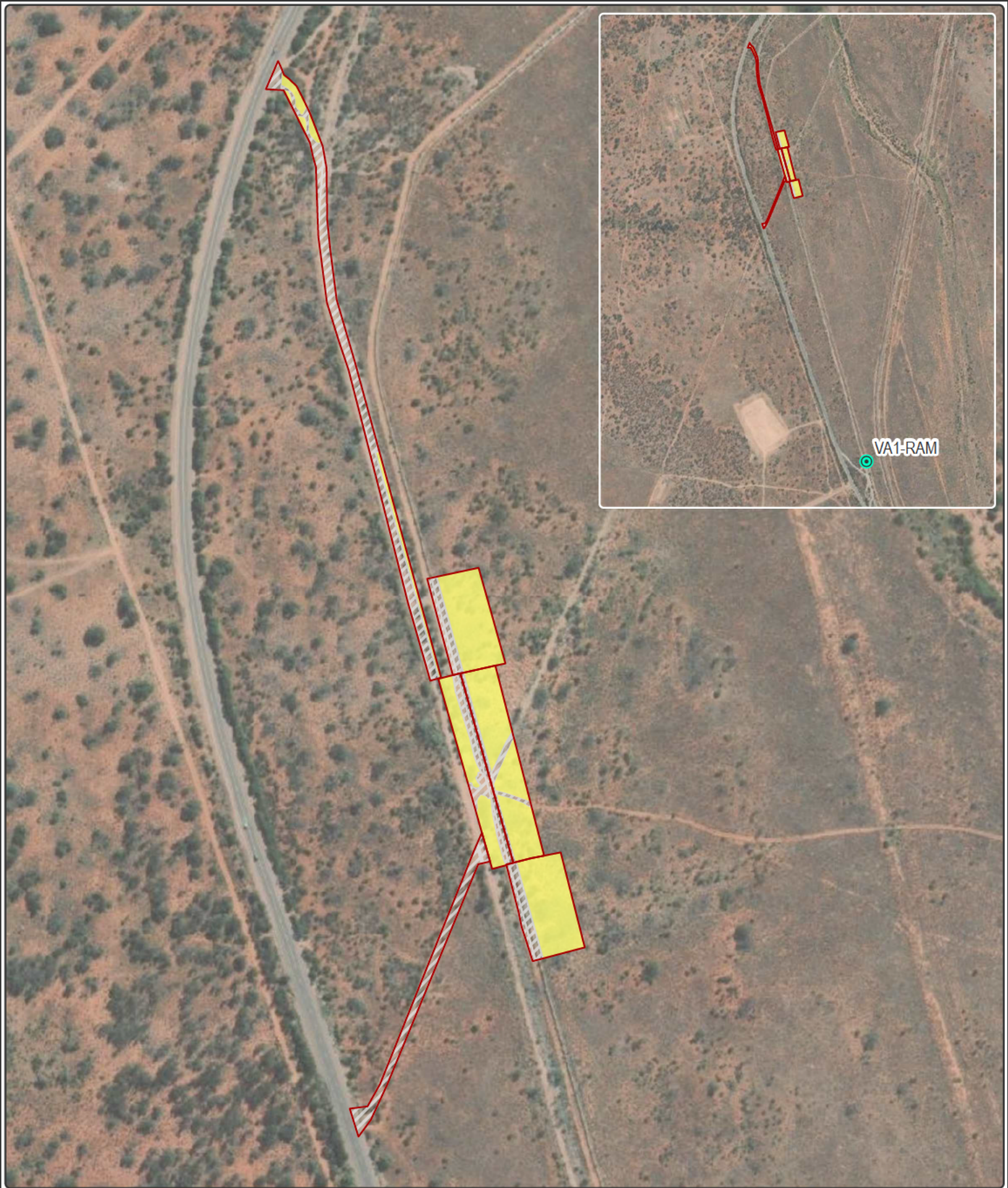




**Figure 2: Ecological features of the study area**







**Figure 3: Ecological features of the study area**

<div style="border: 2px solid red; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> Study area <div style="color: green; font-weight: bold; font-size: 1.2em; margin-right: 5px;">●</div> RAM	<b>Vegetation association</b> <div style="background-color: yellow; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> VA1 <div style="background: repeating-linear-gradient(45deg, transparent, transparent 2px, black 2px, black 4px); width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> Exotic vegetation / cleared / existing infrastructure	<div style="margin-bottom: 10px;">         0                      75                      150  <div style="border-top: 1px solid black; position: relative; width: 100%; height: 0; margin-top: 5px;"> <span style="position: absolute; left: 0; top: -5px;">0</span> <span style="position: absolute; left: 25%; top: -5px;">75</span> <span style="position: absolute; left: 100%; top: -5px;">150</span> </div>         Metres       </div> <div style="border: 1px solid #ccc; padding: 5px; font-size: 0.8em;">         Datum/Projection:          GDA 1994 MGA Zone 53          22ADL3518-OK    Date: 20/12/2023       </div>
<div style="display: inline-block; vertical-align: middle; text-align: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; height: 15px; width: 0; margin: 0 auto;"></div> <div style="margin: 2px 0;">N</div> </div> <div style="display: inline-block; vertical-align: middle; text-align: center;">   <small>A TETRA TECH COMPANY</small> </div>		



## 2.2 Details of the proposal

Table 2: Details of the proposed vegetation clearance, areas, and assessment methods

Renewal Section and map reference	Description	Vegetation Associations present	Additional comments/requirements regarding vegetation survey
Bushland Assessment Method			
MWPL1-0002	Tanderra Village Entry Gullet. 51 m of gullet renewal	V4- <i>Marieana brevifolia</i> (Short-leaf Bluebush), <i>Maireana sedifolia</i> (Pearly bluebush) and <i>Atriplex stipitata</i> (Bitter saltbush) low open chenopod shrubland	A 25 m wide construction corridor is required for the pipeline renewal and decommissioning.  A laydown area is proposed within the Tanderra Village area. Access will be via existing road. No additional clearance is anticipated.
MWPL1-0005	Whyalla Railway Yard Gullet. 787 m of gullet renewal.	V4- <i>Marieana brevifolia</i> (Short-leaf Bluebush), <i>Maireana sedifolia</i> (Pearly bluebush) and <i>Atriplex stipitata</i> (Bitter saltbush) low open chenopod shrubland  V6- <i>Acacia papyrocarpa</i> (western myall) very open woodland over <i>Maireana brevifolia</i> (Short-leaf Bluebush) chenopod shrubland  VA7 – <i>Atriplex vesicaria</i> (Bladder Saltbush) low open chenopod Shrubland	A 25 m wide construction corridor is required for the pipeline renewal.  Up to a 20 m wide corridor may be required for removal of existing pipeline.  Existing access tracks will be utilised wherever possible and a 6 m wide access will be required to access the construction corridor.  Three laydown areas are proposed within already disturbed land.
Rangelands Assessment Method			
MWPL1-0006	Valve Chamber (ID: 4137013) and pipework. 70 0m of pipeline renewal.	VA1 <i>Acacia papyrocarpa</i> (western myall) open woodland	A 17 m wide construction corridor to west is required for the pipeline renewal. Up to a 25 m wide corridor may be required on eastern side of existing pipeline for removal of existing pipeline.  Existing access tracks off Lincoln Highway at the northern and southern ends will be utilised for construction. These will be required to be 8 m wide, therefore additional clearance may be

			<p>required where the existing tracks are narrower than this requirement. Noting under SAW SOP, a 5 m wide maintenance access is allowable next to an existing pipeline.</p> <p>Laydown for construction materials will be required.</p>
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### **2.3 Approvals required or obtained.**

The main approval required for this project relates to native vegetation removal and is the subject of this data report. Additional information is provided in regard to other relevant State and Commonwealth legislation.

- *Native Vegetation Act 1991* (NV Act)

The clearance of native vegetation is necessary and will occur under the *Native Vegetation Regulations 2017* (Regulation 12. Schedule 1: Clause 34, Infrastructure). Clearance approval and offsetting will be required for the removal of any native vegetation (the subject of this data report). Risk Level is 4 due to a Total Biodiversity Score (TBS) greater than 250.

- *Planning, Development, and Infrastructure Act 2016* (PDI Act)

No development approval is required for these works in accordance with Division 2 of the PDI Act.

The project also falls outside of the designated area in which the Regulated and Significant tree controls apply – which is limited to the whole of Metropolitan Adelaide (with exceptions), and parts of the Adelaide Hills Council and the District Council of Mount Barker (with exceptions).

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The removal of vegetation subject to this Native Vegetation Clearance Application is unlikely to result in significant impact to Matters of National Environmental Significance (MNES) listed under the EPBC Act.

Three species *Leipoa ocellata* (Malleefowl), *Amytornis textilis myall* (Western Grasswren) and *Aphelocephala leucopsis* (Southern Whiteface) listed with a possible rating in the likelihood of occurrence table. (Table 8) A self-assessment was prepared for these species undertaken in accordance with the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance*.

- *National Parks and Wildlife Act 1972* (NPW Act)

The field investigation was conducted under a current scientific permit (permit number M27061-1) for flora collection, issued by DEW under section 49(1)(a) of the NPW Act.

The project is not impacting directly on any state reserves.

#### *Aboriginal Heritage Act 1988*

The site is assessed as medium risk in areas not previously disturbed and all works will follow SA Water standard operating procedures if sites are found during construction.

- *Landscapes South Australia Act 2019* (LSA Act)

According to section 104(4)(g) of the LSA Act a Water Affecting Activity (WAA) permit is required when destroying vegetation growing in a watercourse or lake or growing on the floodplain of a watercourse. SA Water understands this requirement.

### **2.4 Native Vegetation Regulation**

Regulation 12, Schedule 1; clause 34, Infrastructure

This application is made to provide essential water supply infrastructure.

### **2.5 Development Application information (if applicable)**

Not Applicable (exempt)

# 3. Method

On ground assessments were carried out between September 12-16, 2022.

## 3.1 Fauna assessment

A desktop review for threatened species under the National Parks and Wildlife Act 1974 (NPW Act) and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) was prepared using Naturemaps and Protected Matters Search Tool and marine species as well as species only found in wetlands were excluded. A likelihood of occurrence table was produced based on the habitats found in the study area and whether this habitat is suitable for the individual species. This detailed in Table 8. Recent (1995 and after) observations of the species were also considered. This review revealed the possible presence of several protected species under both the NPW Act and the EPBC act. This assessment excluded marine and coastal species such as waders and other shorebirds. The results of this assessment can be found in Table 8

An on-ground survey is not necessary at this level.

## 3.2 Desktop assessment

The sections of pipeline requiring renewal fall within the zone requiring the use of the Bushland Assessment method (BAM) and the Rangelands Assessment Method (RAM) . Details of this methodology are specified in the Bushland Assessment Manual (NVC 2020a) and the Rangelands Assessment Manual (NVC 2020b)

A desktop assessment was undertaken to determine the potential for any threatened flora, fauna or TECs (Threatened Ecological Community) which are listed under the NPW Act and EPBC Act, to occur within the clearance area. These searches applied a 50km buffer to the clearance area as required for the for the RAM. The RAM sites overlap completely the BAM sites and so a separate 5km buffer search as required for the BAM sites was not undertaken.

### 3.2.1 PMST report

A Protected Matters Search Tool (PMST) report was generated to identify nationally threatened flora and fauna, migratory fauna and TECs under the EPBC Act within the study area (Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2021). In accordance with the Native Vegetation Council (NVC), species identified in the PMST report that are known to occur within the search area were assessed for their likelihood of occurrence within the study area.

### 3.2.2 BDBSA data extract

A data extract from the Biological Database of South Australia (BDBSA) was obtained from Department for Environment and Water (DEW) to identify flora and fauna species that have been recorded within 5 km of the study area (Department for Environment and Water, 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 DEWs standards for data quality, integrity, and maintenance. In accordance with the BAM Manual, only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

## 3.3 Flora assessment

A field survey of the study area was undertaken by Tobias Scheid (NVC Accredited Consultants) on the September 12-16 2022. Features of ecological significance were recorded including instances of native vegetation, habitat features as well as presence of *Landscape South Australia Act 2019* (LSA Act) declared weeds. Field surveys were undertaken accordance with the NVC BAM in areas of remnant vegetation within the study area. This enabled losses to be calculated under the permitted clearing regulations should impacts be unavoidable.

# 4. Assessment Outcomes

## 4.1 Vegetation Assessment

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

The proposed clearance area occurs on undulating plains, with soils being mainly stony. There are no watercourses or wetlands recorded within or anywhere near the study area. The closest water is the coast of the Eastern Eyre Peninsula, which at its closest point is about 1.5 km from the survey areas. The main land use surrounding all proposed clearance areas is production from dryland agriculture and built-up areas near Whyalla.

Whyalla Conservation Park is located approximately 2.5 km north from northern end of the study area

Three native vegetation associations have been described within the proposed impact areas, these vegetation associations have been summarized in Table 3 and discussed in further detail in Table 5, Table 6, Table 7

Impacts to these vegetation associations occur through lengths of clearances up to 25 m in width, along the existing pipeline.

Table 3: Native vegetation associations within the proposed impact area

BAM Block	BAM/RAM Site	Vegetation Association Name	TEC	Total Impact area (ha)	Rehabilitation reduction (0.5) area total
	<b>BAM Sites</b>				
A2	VA4	<i>Marieana brevifolia</i> (Short-leaf Bluebush), <i>Maireana sedifolia</i> (Pearly bluebush) and <i>Atriplex stipitata</i> (Bitter saltbush) low open chenopod shrubland	No	5.03	-
	VA6	<i>Acacia papyrocarpa</i> (western myall) very open woodland over <i>Maireana brevifolia</i> (Short-leaf Bluebush) chenopod shrubland	No	1.05	-
	VA7	<i>Atriplex vesicaria</i> (Bladder Saltbush) low open chenopod Shrubland	No	1.67	-
	<b>RAM Sites</b>				
	VA1	<i>Acacia papyrocarpa</i> low open woodland over chenopod shrubland	No	1.09	-
Subtotal				8.85	-



## Details of the vegetation associations proposed to be impacted.

Table 4: Summary table for Vegetation Association VA1


Vegetation Association	VA1 - <i>Acacia papyrocarpa</i> low open woodland over chenopod shrubland				
					
Photo 1 taken facing S at easting: 735283, Northing: 6376423					
General description	Native vegetation within VA1 occurred between the roads and a rail lines. The native vegetation within VA1 contained 12 native species with <i>Acacia papyrocarpa</i> (Western Myall), <i>Acacia oswaldii</i> (Umbrella Wattle) and <i>Atriplex vesicaria</i> (Bladder Saltbush) being the dominant species. Weedy species include <i>Carrichtera annua</i> (Ward's Weed) and <i>Lycium ferocissimum</i> (African Boxthorn).				
Threatened species or community	Threatened species with current occurrence records nearby which may use this as habitat include: White-winged Chough, Grey Falcon, Scarlet Chested Parrot, Major Mitchell's Cockatoo and Carpet Python. Refer to the likelihood of occurrence table (Table 8) for the full assessment.				
Landscape context score	1.08	Vegetation Condition Score	40.48	Conservation significance score	1.1
Unit biodiversity Score	48.98	Area (ha)	1.09	Total biodiversity Score	53.38



Table 5: Summary table for Vegetation Association VA4


Vegetation Association	VA4 - <i>Marieana brevifolia</i> (Short-leaf Bluebush), <i>Maireana sedifolia</i> (Pearly bluebush) and <i>Atriplex stipitata</i> (Bitter saltbush) low open chenopod shrubland				
					
Photo 2 taken facing S at easting: 740558, Northing: 6343903					
General description	<p>Native vegetation within VA4 occurred between the roads and a rail line (see Figure 2). The native vegetation within VA4 contained 28 native species with <i>Marieana brevifolia</i> (Short-leaf Bluebush), <i>Maireana sedifolia</i> (Pearly bluebush) and <i>Atriplex stipitata</i> (Bitter saltbush) being the dominant species.</p> <p>Declared weeds present: There were 15 species of declared weeds present in VA4, among these were <i>Avena barbata</i> (Bearded Oat), <i>Carrichtera annua</i> (Ward's Weed) and <i>Lycium ferocissimum</i> (African Boxthorn)</p>				
Threatened species or community	Threatened species with current occurrence records nearby which may use this as habitat including: Slender-billed Thornbill, Western Grasswren, and Southern Whiteface . Refer to the likelihood of occurrence table (Table 8) for the full assessment.				
Landscape context score	1.06	Vegetation Condition Score	48.96	Conservation significance score	1.1
Unit biodiversity Score	57.08	Area (ha)	5.03	Total biodiversity Score	287.11

Table 6: Summary table for Vegetation Association VA6



Vegetation Association	VA6 – <i>Acacia papyrocarpa</i> (western myall) very open woodland over <i>Maireana brevifolia</i> (Short-leaf Bluebush) chenopod shrubland				
					
Photo 3 taken facing N at easting: 740780, Northing: 6345505					
General description	Native vegetation within VA6 occurred between the roads and a rail line (see Figure 2). The native vegetation within VA6 contained 26 native species with <i>Acacia papyrocarpa</i> (Western myall) <i>Maireana brevifolia</i> (Short-leaf Bluebush) and <i>Atriplex stipitata</i> (Bitter Saltbush) being the dominant species. Declared weeds present: There were 6 species of declared weeds present in VA4, among these were <i>Avena barbata</i> (Bearded Oat), <i>Carrichtera annua</i> (Ward’s Weed) and <i>Asphodelus fistulosus</i> (Onion Weed )				
Threatened species or community	Threatened species with current occurrence records nearby which may use this as habitat including: Slender-billed Thornbill, Western Grasswren, and Southern Whiteface. Refer to the likelihood of occurrence table (Table 8) for the full assessment.				
Landscape context score	1.06	Vegetation Condition Score	54.15	Conservation significance score	1.1
Unit biodiversity Score	63.14	Area (ha)	1.05	Total biodiversity Score	66.30



Table 7: Summary table for Vegetation Association VA7

Vegetation Association	VA7 – <i>Atriplex vesicaria</i> (Bladder Saltbush) low open chenopod Shrubland				
					
Photo 4 taken facing NE at easting: 741123, Northing: 6347056					
General description	Native vegetation within VA7 occurred between the roads and a rail line (see Figure 2). The native vegetation within VA7 contained 9 native species with <i>Atriplex vesicaria</i> (Bladder Saltbush) being the dominant species. Declared weeds present: <i>Carrichtera annua</i> (Ward's Weed)				
Threatened species or community	Threatened species with current occurrence records nearby which may use this as habitat including: Slender-billed thornbill, Western Grasswren, and Southern Whiteface. Refer to the likelihood of occurrence table (Table 8) ) for the full assessment.				
Landscape context score	1.03	Vegetation Condition Score	30.19	Conservation significance score	1.10
Unit biodiversity Score	34.20	Area (ha)	1.67	Total biodiversity Score	57.11

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

See Figure 2

## 4.2 Threatened Species assessment.

The database assessment identified 86 national or state significant species in the study area (49 fauna and 37 flora) which have either been recently (since 1995) recorded within 50 km of the study area (BDBSA results) or known to occur within 50 km of the study area (PMST report). This figure excludes marine species and species known to only inhabit coastal areas i.e., waders and other shorebirds.

Although it was assessed that a number of threatened flora and fauna species may/ are likely to exist in the study area, none of the flora species were recorded during field survey despite active searching, and therefore are considered unlikely to occur. No Fauna surveys were conducted and there were no opportunistic observations of any species of conservation concern. For the full assessment of likelihood of Occurrence for all threatened species identified by the PMST and BDBSA searches see (Table 8) below.

**Species observed on site or recorded within 50 km of the application area since 1995, or the vegetation is considered to provide suitable habitat.**

Table 8 likelihood of occurrence table

Species	Common name	NP&W Act	EPBC Act	Number of records (within 50 km)	Data source	Date of last record	Species known habitat preferences.	Likelihood of use for habitat – Comments
<b>Birds</b>								
<i>Acanthiza iredalei iredalei</i>	Slender-billed Thornbill (western)	R	-	1	1	26/07/2011	Occurs in arid and semi-arid regions of southern Western Australia and south-western South Australia. Its known distribution extends from near Carnarvon in Western Australia, east through central Western Australia, and across the Nullarbor Plain to Whyalla, Port Augusta and Port Davis in South Australia. Usually occurs in chenopod shrublands that are dominated by samphire's or <i>Maireana</i> and <i>Atriplex</i> associations. It occasionally occurs in <i>Acacia</i> shrublands and mangroves adjacent to more preferred habitat. Also been recorded in shrublands and mangroves at coastal sites where these habitat types occur adjacent to more preferred samphire shrublands.	Unlikely – No suitable habitat
<i>Amytornis merrotsyi</i>	Short-tailed Grasswren	ssp	ssp	1	1	28/03/2011	Found across the Flinders Ranges (SA), Short-tailed Grasswrens inhabit rocky (quartzitic) hillsides and hilltops, steep-sided gullies, stony rises and ridge-crests and, less often, foothills (Garnett et al., 2011; Higgins et al., 2001). The vegetation is spinifex ( <i>Triodia</i> ) tussock grassland, usually with scattered low shrubs, particularly <i>Acacia</i> spp., <i>Daviesia genistifolia</i> , <i>Xanthorrhoea quadrangulata</i> and <i>Cassia</i> spp., and occasionally an open overstorey of <i>Callitris</i> spp (Cypress pine). or <i>Eucalyptus</i> spp. (Mallee) (Christidis et al., 2008).	Unlikely – No suitable habitat
<i>Amytornis textilis myall</i>	Western Grasswren	VU	V	252	1,5	4/12/2019	Relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both; habitat with low tree densities and an herbaceous understorey litter cover which provides essential foraging habitat; living and dead trees with hollows and crevices which are essential for roosting and nesting	Possible- but habitat is fragmented and degraded

<i>Aphelocephala leucopsis leucopsis</i>	Southern Whiteface	VU	VU	231	1,5	27/08/2021	The subspecies is very occasionally found on rocky, Triodia (Spinifex)-covered hills within the Gawler Ranges (Higgins et al. 2001). Habitat preferences for this subspecies are poorly known, but most of the subspecies' habitat is found along drainage lines. Occupied habitat also includes low rocky hills and semi-arid low woodlands. In a survey by Black et al. (2009), the density of shrub cover in occupied sites was found to be higher than in unoccupied sites.	Possible- but habitat is fragmented and degraded
<i>Ardeotis australis</i>	Australian Bustard	-	V	11	1	27/01/2019	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.	Unlikely – No suitable habitat
<i>Cinclosoma castanotum</i>	Chestnut Quailthrush (Chestnut-backed Quailthrush)	-	R	15	1	15/11/2018	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.	Unlikely – No suitable habitat
<i>Corcorax melanorhamphos</i>	White-winged Chough	-	R	8	1	16/11/2018	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 (BirdLife Australia, 2020).	Unlikely – No suitable habitat
<i>Coturnix ypsilophora australis</i>	Brown Quail	-	V	10	1	15/04/2018	Prefers dense grasslands, often on the edges of open forests, and bracken. May sometimes be seen alongside roads.	Unlikely – No suitable habitat
<i>Falco hypoleucos</i>	Grey Falcon	VU	R	6	1,5	18/10/2011	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 (Schoenjahn 2018). 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 (Threatened Species Scientific Committee)	Unlikely – No suitable habitat



<i>Falco peregrinus macropus</i>	Peregrine Falcon	-	R	22	1	6/10/2020	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. (Dewey and Potter 2002)	Unlikely – No suitable habitat
<i>Falco subniger</i>	Black Falcon	-	R	24	1	13/09/2020	Black falcons may be encountered anywhere in South Australia except the south-west. They favour sparse woodlands, scrubby grasslands and farmlands in the drier areas and can sometimes be seen following fires, farm machinery, shooters and other raptors in search of flushed prey	Unlikely – No suitable habitat
<i>Grantiella picta</i>	Painted Honeyeater	VU	R	-	5	-	Sparsely distributed from southern Victoria and south-eastern South Australia to far northern Queensland and eastern Northern Territory (Birdlife International NDb). Forest, woodland, dry scrub, often with abundant mistletoe. Dependent on mistletoe berries (Morecombe eGuide 2020)	Unlikely – No suitable habitat
<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	-	R	1	1	16/10/2006	Found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton, then across northern Australia south almost to Perth, avoiding only the Western Australian deserts. Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. (NSW Government Environment and Heritage 2012)	Unlikely – No suitable habitat
<i>Hieraaetus morphnoides</i>	Little Eagle	-	V	33	1	2/10/2021	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 (BirdLife Australia, 2020).	Unlikely – No suitable habitat
<i>Hirundapus caudacutus caudacutus</i>	White-throated Needletail	sp	V	1	1	10/01/2003	Almost exclusively aerial in Australia, recorded most commonly above wooded areas (DAWE, 2020).	Unlikely – No suitable habitat
<i>Hylacola cauta cauta</i>	Shy Heathwren (EP, YP, FR, MM, upper SE)	-	R	10	1	25/08/2021	Prefers dense shrubby or heath understorey in mallee woodland, mallee shrubland or mallee heath in coastal and semi-arid regions, often where spinifex (Triodia) occurs and with dense shrubs such as Banksia, Hakea and Grevillea, also tea-tree (Leptospermum) and cypress pine (Callitris) (Gregory, 2020).	Unlikely – No suitable habitat
<i>Hylacola pyrrhopygia</i>	Chestnut-rumped Heathwren	ssp	ssp	15	1	28/11/2019	Inhabits heaths of coastal, mountain and hinterland areas; dense undergrowth of forests and woodlands. Found in South-eastern Australia. In SA occurs in the SE, Adelaide Mount Lofty Ranges and Northern Yorke districts.	Unlikely – No suitable habitat

<i>Leipoa ocellata</i>	Malleefowl	VU	V	662	1,5	1/10/2021	Inhabits semi-arid regions of southern Australia. In South Australia, the Malleefowl is distributed from the south-east, north to the Murray-Mallee region and west to Streaky Bay, south of 32°S. The species also occurs west of the Eyre Peninsula. Recent records from the Yellabinnia wilderness area and the Great Victoria Desert indicate that the species occurs north to approximately 26°30'S in the north-west of South Australia. Occupies shrublands and low woodlands that are dominated by mallee vegetation. It also occurs in other habitat types including <i>Eucalypt</i> or <i>Callitris</i> (Native pine) woodlands, <i>Acacia</i> shrublands, <i>Melaleuca uncinata</i> (Broombush) vegetation or coastal heathlands. (DOE 2014c)	Unlikely – No suitable habitat
<i>Lichenostomus cratitius</i>	Purple-gaped Honeyeater	-	ssp	7	1	28/09/2002	Mallee, tall heath and associated low <i>Eucalypt</i> woodland	Unlikely – No suitable habitat
<i>Lichenostomus cratitius occidentalis</i>	Purple-gaped Honeyeater (mainland SA)	-	R	3	1	3/04/2020	Occurs in fragmented areas in mallee from south and central WA to central Vic (Clements 2007).	Unlikely – No suitable habitat
<i>Lophochroa leadbeateri mollis</i>	Major Mitchell's Cockatoo (NW, EP)	-	SP	28	1	16/12/2019	The Major Mitchell's Cockatoo occurs only in Australia, where it usually inhabits semi-arid and arid regions, mainly inland, but in some coastal areas. Major Mitchell's Cockatoos usually inhabit dry woodlands in arid and semi-arid areas, usually where eucalypts or acacias dominate the vegetation. They require old trees which support hollows that are large enough to be suitable for nesting in (BirdLife Australia, 2020).	Unlikely – No suitable habitat
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (YP, MN, AP, MLR, MM, SE)	-	R	1	1	24/04/2015	Occurs across south-eastern Australia, most of NSW, VIC and south-eastern SA. South-eastern subspecies found in <i>Eucalypt</i> woodland and mallee and <i>Acacia</i> shrubland (DEH 2008a).	Unlikely – No suitable habitat
<i>Myiagra inquieta</i>	Restless Flycatcher	-	R	12	1	18/09/2014	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 (Birds in Backyards ND).	Unlikely – No suitable habitat
<i>Neophema chrysostoma</i>	Blue-winged Parrot	-	V	8	1,5	14/03/2021	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 (Birdlife Australia ND).	Unlikely – No suitable habitat

<i>Neophema elegans elegans</i>	Elegant Parrot	-	R	153	1	18/10/2011	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 (BirdLife Australia, 2020).	Unlikely – No suitable habitat
<i>Neophema petrophila zietzi</i>	Rock Parrot	-	R	4	1	30/11/2005	Inhabits the rocky coastlines of south and west Australia. There are two major populations, in the east along the coast from Kingston to Ceduna in South Australia and in Western Australia from Cape Arid National Park to Geraldton. Restricted to coastlines and offshore rocky islands, frequenting windswept coastal dunes, mangroves, saline swamps and rocky islets (Birds in Backyards ND).	Unlikely – No suitable habitat
<i>Neophema splendida</i>	Scarlet-chested Parrot	-	R	4	1	4/02/2017	The species occurs in the mallee or mulga woodland of southern semi-arid inland Australia (Birdlife international ND).	Unlikely – No suitable habitat
<i>Pachycephala inornata</i>	Gilbert's Whistler	-	R	33	1	3/02/2021	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 (Environment and Heritage 2014). Habitat is shrubby woodland and mallee (Simpson and Day 1999, p. 227).	Unlikely – No suitable habitat
<i>Pedionomus torquatus</i>	Plains-wanderer	CR	E	-	5	-	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 (DOE 2014)	Unlikely – No suitable habitat
<i>Petroica boodang boodang</i>	Scarlet Robin	-	R	15	1	10/10/2017	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 (Environment, Energy and Science 2021).	Unlikely – No suitable habitat

<i>Philemon citreogularis citreogularis</i>	Little Friarbird	-	R	1	1	26/06/2012	Widespread in northern and eastern Australia, found from Broome, Western Australia across the Top End to Queensland, and down the coast of New South Wales as far as the Central Coast. Widespread in Western New South Wales and northern Victoria along Murray River, to South Australia. This species also occurs in New Guinea. Found near water, mainly in open forests and woodlands dominated by eucalypts. Also found in wetlands, monsoon forests, mangroves and coastal heathlands. Only extend into arid zone along waterways. Mostly tropical, but also common in semi-arid zone. It will also be seen in gardens and orchards (Birds in Backyards ND).	Unlikely – No suitable habitat
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater	-	R	2	1	19/10/2014	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 (Birds in Backyards ND).	Unlikely – No suitable habitat
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	-	ssp	1	1	10/08/2020	Widespread throughout north-western, northern, central and eastern Australia. It is also found in Papua New Guinea. Found in open forests and woodlands, favouring inland plains with an open shrub layer, little ground cover and plenty of fallen timber and leaf litter. May be seen along roadsides and around farms (Birdlife Australia ND).	Unlikely – No suitable habitat
<i>Spatula rhynchotis</i>	Australasian Shoveler	-	R	8	1	14/03/2021	The Australasian Shoveler is found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast.	Unlikely – No suitable habitat
<i>Stagonopleura guttata</i>	Diamond Firetail	-	V	23	1,5	11/11/2018	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 (DEH 2008).	Unlikely – No suitable habitat

<i>Tringa glareola</i>	Wood Sandpiper	-	R	1	1	22/04/2000	In South Australia most records occur east of the line from south Eyre Peninsula through Old Nilpinna to Purnu Bore, with most occurring south of 33° S on the Yorke Peninsula, Adelaide Plains, Murray Mallee and south-east regions. The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially <i>Melaleuca</i> and <i>Eucalyptus camaldulensis</i> and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. They are also found at some small wetlands only when they are drying. They are rarely found using brackish wetlands, or dry stunted saltmarsh. Typically, they do not use coastal flats, but are occasionally recorded in stony wetlands. This species uses artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains (DAWE, 2020; Higgins & Davies, 1996).	Unlikely – No suitable habitat
<i>Turnix varius varius</i>	Painted Buttonquail	-	R	2	1	28/11/2021	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 understory and deep leaf litter on the ground (BirdLife Australia, 2020).	Unlikely – No suitable habitat
<b>Mammals</b>								
<i>Petrogale xanthopus xanthopus</i>	Yellow-footed Rock-wallaby	VU	SP	136	1	24/06/2022	In South Australia, this species inhabits rocky outcrops, cliffs and ridges in semi-arid country, ranging from sandstones, limestones and conglomerates in the Flinders Ranges, to granites in the Gawler Ranges and Olary Hills (Copley & Alexander, 1997).	Unlikely – No suitable habitat
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	VU	R	2	1	21/04/2012	Forests and woodlands	Unlikely – No suitable habitat
<i>Sminthopsis psammophila</i>	Sandhill Dunnart	EN	V	131	1	22/01/2019	The sandhill dunnart occurs in isolated sandy arid and semi-arid areas in the Great Victoria Desert and the Eyre Peninsula. It occurs in vegetation dominated by hummock (Triodia) grassland. The species shelters during the day in nests in the	Unlikely – No suitable habitat

							centre of large hummocks, especially in hummocks that have started to die off in the centre, where the dig a circular depression (DAWE, 2020).	
<b>Reptiles</b>								
<i>Aprasia pseudopulchella</i>	Flinders Worm-lizard	VU			5		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 (Cogger et al. 1993). 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 (TSSC 2008dj). Occurs in open woodland, native tussock grassland, riparian habitats, and rocky isolates (Cogger et al. 1993).	Unlikely – No suitable habitat
<i>Morelia spilota</i>	Carpet Python	-	R	4	1	21/01/2011	Prefers riparian vegetation groups, and dry sclerophyll forest with ground cover and logs. Lives in hollows of large River Red Gums and north-facing cliffs along the Murray River (DEH, 2008).	Unlikely – No suitable habitat
<i>Neelaps bimaculatus</i>	Western Black-naped Snake	-	R	1	1	14/12/2015	Occupies suitable habitat throughout south-western WA and into SA's Eyre Peninsula. Prefers habitats dominated by mallee on relatively deep sandy soils within SA (Schembri, 2017).	Unlikely – No suitable habitat
<i>Varanus rosenbergi</i>	Heath Goanna	-	V	1	1	8/10/2021	Prefers heath, wet and dry forest and temperate woodlands usually with sandy soils and termite mounds present. (Bennett et al 2018)	Unlikely – No suitable habitat
<i>Varanus varius</i>	Lace Monitor	-	R	17	1	23/06/2008	This species is a large arboreal lizard which is found in eastern and southeastern Australia from Cape York Peninsula (Queensland) to south-eastern South Australia (Cogger 2000). Lace Monitors occur in well-timbered areas from dry woodlands to cool temperate forests in southern Australia.	Unlikely – No suitable habitat
<b>Plants</b>								
<i>Acacia gracilifolia</i>	Graceful Wattle	-	R	16	1	13/10/2019	Restricted to the Flinders Ranges (southern part) and also the Northern Lofty region. Grows on rocky hillsides and in gorges in open woodland scrub in association with <i>Eucalyptus odorata</i> and <i>E. socialis</i> on shallow compact loam soils (eFloraSA).	Unlikely – Not recorded during field investigation
<i>Acacia iteaphylla</i>	Flinders Ranges Wattle	-	R	2	1	23/11/1999	In semi-arid and temperate South Australia, <i>Acacia iteaphylla</i> (Flinders Range wattle) grows mainly among rocky outcrops on hillsides or along rocky creeks in valleys (Weeds of Australia 2016).	Unlikely – Not recorded during field investigation

<i>Acacia montana</i>	Mallee Wattle	-	R	2	1	25/11/2010	Mallee, on sandy red earths. Also stony ridges and on heavy clay soils.	Unlikely – Not recorded during field investigation
<i>Acacia pendula</i>	Weeping Myall	-	V	2	1	18/01/2019	Grows mainly on floodplains in fertile alluvial clay and red earth soils in the South, sometimes dominant in woodland and open woodland.	Unlikely – Not recorded during field investigation
<i>Acanthocladium dockeri</i>	Spiny Everlasting	CR	E	6	1	5/11/2008	Grows mainly in remnant grassland on low hills and plains in the mid-north of South Australia.	Unlikely – Not recorded during field investigation
<i>Anthocercis angustifolia</i>	Narrow-leaf Ray-flower	-	R	1	1	12/06/1996	On steep rocky slopes usually above watercourses; rare, at a few sites in the Flinders and Mt Lofty Ranges; sometimes locally abundant following fire. SA: FR, NL, SL.	Unlikely – Not recorded during field investigation
<i>Austrostipa breviglumis</i>	Cane Spear-grass	-	R	2	1	14/10/1996	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> (Jessop 2006).	Unlikely – Not recorded during field investigation
<i>Bothriochloa macra</i>	Red-leg Grass	-	R	2	1	16/01/1998	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.	Unlikely – Not recorded during field investigation
<i>Brachyscome muelleri</i>	Corunna Daisy	EN	E	4	1	16/09/2005	Known from one site on Corunna Station in the upper Eyre Peninsula of SA and has been successfully translocated to western edge of the Baxter Hills. Grows on steep south-facing cliff-foot slopes of the Baxter Hills, approximately 5 km from Iron Knob (Australian Government 2013).	Unlikely – Not recorded during field investigation
<i>Caladenia coactilis</i>	Flinders Ranges Caladenia	-	R	1	1	6/09/2007	Usually grows in open forest and is found in the southern Flinders Ranges and northern Mount Lofty Ranges (eFloraSA).	Unlikely – Not recorded during field investigation



								which was during peak flowering period
<i>Caladenia gladiolata</i>	Bayonet Spider-orchid	EN	E	2	1	3/09/2002	Endemic to SA. Emerges in winter and produces a single flower stem in Aug-Sep. Grows in woodland dominated by <i>Eucalyptus leucoxylon</i> (South Australian Blue Gum), <i>E. cladocalyx</i> (Sugar Gum) or <i>E. fasciculosa</i> (Pink Gum). Grows on moderate to steep slopes in sandy loam soils with scattered shale and quartzite.	Unlikely – Not recorded during field investigation which was during peak flowering period
<i>Caladenia macroclavia</i>	Large-club Spider-orchid	EN	E	1	1	3/09/2002	The Large-club Spider-orchid is endemic to the Yorke Peninsula of South Australia where it occurs at five sites: Agery Reserve, Mona Railway Reserve, Muloowurtie Conservation Reserve, Pt Julia site, and Pt Vincent site. The orchid's distribution may once have covered the Eyre Peninsula to the Murray Region, but now appears to be confined to the Yorke Peninsula. The orchid grows on sandy clay loam soil over limestone in mallee and broombush. While mallee woodland and grassland were once widespread over Yorke Peninsula, the Largeclub Spider-orchid now survives mostly in small remnant blocks and along roadsides. Vegetation at all known sites is dominated by mallee species such as <i>Eucalyptus gracilis</i> , <i>E. socialis</i> , and <i>E. incrassata</i> .	Unlikely – Not recorded during field investigation which was during peak flowering period
<i>Caladenia saxatilis</i>	Star Spider-orchid	-	R	3	1	7/09/2007	Occurs in the Flinders Ranges, Northern Lofty, Murray and Yorke Peninsula botanical regions of South Australia where it grows among rocks in tall forest (State Herbarium SA).	Unlikely – Not recorded during field investigation which was during peak flowering period

<i>Caladenia woolcockiorum</i>	Woolcock's Spider-orchid	VU	E	1	1	4/10/2000	Endemic to SA, currently thought to be restricted to three sub-populations but surveys may have underestimated the distribution. Typically grows in <i>Eucalyptus cladocalyx</i> (Sugar Gum), <i>E. goniocalyx</i> (Long-leaved Box), <i>E. leucoylon</i> ssp. <i>pruinosa</i> (Yellow gum) open forest or woodland. Grows on the mid to lower slopes of steep gullies, in relatively open herbaceous understorey vegetation with loam soils.	Unlikely – Not recorded during field investigation which was during peak flowering period
<i>Caladenia xantholeuca</i>	Flinders Ranges White Caladenia	EN	E	5	1	31/08/2002	Endemic to SA. Known to have occurred in three sub-populations in the Southern Flinders Ranges. Two sub-populations were recorded from Mt Remarkable National Park in 1978 and another in Telowie Gorge Conservation Park in 1982. Occurs in <i>Callitris glaucophylla</i> Woodland often on south facing slopes in heavily shaded areas, where it grows on mossy rock ledges and red-brown loam soils.	Unlikely – Not recorded during field investigation which was during peak flowering period
<i>Choretrum chrysanthum</i>	Yellow Sour-bush	-	R	3	1	18/10/2014	Found in the southern part of South Australia from the west coast to the lower South-east. Also found in Western Australia and Victoria. Native. Common in South Australia. Rare in Victoria. Uncommon in Western Australia.	Unlikely – Not recorded during field investigation
<i>Cryptandra campanulata</i>	Long-flower Cryptandra	-	R	2	1	7/03/2008	Grows in rocky habitats of the northern Mount Lofty Ranges and southern Flinders Ranges.	Unlikely – Not recorded during field investigation
<i>Drosera stricticaulis</i>	Erect Sundew	-	V	1	1	1/08/1999	SA: EP. Also occurs in WA. Sandy clay, loam. Along watercourses, granite outcrops. On EP records mainly confined to around the southern EP, with one recent outlying record from Dark Range CP. Occurs within <i>Eucalyptus cretata</i> (Darke Peak Mallee), <i>Eucalyptus odorata</i> (Peppermint Box) Mallee, Granite rock run-off area, In damp clay/sand in water retentive soils, drainage lines in <i>Eucalyptus camaldulensis</i> woodlands.	Unlikely – Not recorded during field investigation
<i>Eremophila subfloccosa</i> ssp. <i>glandulosa</i>	Green-flower Emubush	-	R	1	1	1/09/2004	SA: FR EA NL MU YP SL	Unlikely – Not recorded during field investigation

<i>Eucalyptus percostata</i>	Ribbed White Mallee	-	R	15	1	2/10/2009	This mallee is endemic to South Australia and known from only a few localities in the southern Flinders Range (Telowie Gorge, Alligator Gorge and east of Devils Peak). <i>Eucalyptus percostata</i> occurs on hills and slopes on loamy soils. (EUCLID, 2020)	Unlikely – Not recorded during field investigation
<i>Frankenia plicata</i>	-	EN	V		5	-	Occurs in SA, from north of Port Augusta along the Stuart Highway to the Northern Territory border and from Port Augusta north-east to Maree. Likely that the species has been under reported due to difficulty of identification of Frankenia spp. The species is found in a wide range of vegetation communities that have good drainage (Neagle, 2002) including on small hillside channels, which take the first run-off after rain (Leigh et al., 1985) and swales of loamy sands to clay in the Simpson Desert (Neagle, 2002).	Unlikely – Not recorded during field investigation
<i>Maireana suaedifolia</i>	Lax Bluebush	-	R	3	1	8/01/2004	SA: NU GT EP. Found on raised areas around salt lakes. Subpopulation located between Cowell – Kimba and Whyalla. Also throughout WA and the Murray Mallee and the Far West. Associated with Mallee with low shrubs, Senna, Olearia and Lomandra effusa on coarse red sands. Also mallee-chenopod low open woodland and in seasonally damp alluvial heavy clay over calcrete with <i>Eucalyptus gracilis</i> , <i>Disphyma crassifolium</i> and <i>Zygophyllum eremaum</i> . (eFloraSA, 2007).	Unlikely – Not recorded during field investigation
<i>Malacocera gracilis</i>	Slender Soft-horns	-	V	6	1	27/10/2016	Grows on saline clay soils or gypseous mounds. SA: GT EA EP.	Unlikely – Not recorded during field investigation
<i>Mentha satureioides</i>	Native Pennyroyal	-	R	1	1	15/12/1998	SA: FR EP NL YP SL SE. Also from Qld; N.S.W.; Vic. Grows in sandy-clay to clay-rich soils, frequently in grassy areas and in open woodland communities.	Unlikely – Not recorded during field investigation
<i>Myoporum parvifolium</i>	Creeping Boobialla	-	R	1	1	21/09/2009	SA: EP MU YP SL KI SE. Subpopulations scattered throughout the EP and also throughout southern SA and Vic. Occurs in sandy coastal areas, Red Gum woodlands, Melaleuca halmaturorum (Swamp Teatree) Very Low Open Forests and dune swales.	Unlikely – Not recorded during field investigation

<i>Orobanche cernua</i> <i>var. australiana</i>	Australian Broomrape	-	R	6	1	29/09/2016	Found in dry sandy creekbeds. Parasitic on native <i>Senecio</i> spp., including <i>S. cunninghamii</i> , and <i>Ixiolaena tomentosa</i>	Unlikely – Not recorded during field investigation
<i>Pterostylis xerophila</i>	Desert Greenhood	VU	V		5	-	Occurs singly or in small populations in fertile soils on or around granite or quartzite rock outcrops, less commonly on fertile alluvial flats (although possibly more common in this situation before settlement). This species has been collected from areas receiving less than 200 mm mean annual rainfall near the Great Victoria Desert. S.Aust.: GT, EP, MU. Vic. (eFloraSA 2023)	Unlikely – Not recorded during field investigation which was during peak flowering period
<i>Pycnosorus globosus</i>	Drumsticks	-	V	3	1	27/10/1999	SA: LE FR EP NL MU. Grows in Wet areas in Plains grassland.	Unlikely – Not recorded during field investigation
<i>Rytidosperma tenuius</i>	Short-awn Wallaby-grass	-	R	1	1	23/11/1999	SA: FR EA NL SL SE. 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,	Unlikely – Not recorded during field investigation
<i>Santalum spicatum</i>	Sandalwood	-	V	42	1	6/03/2020	This species grows on loam and among rocks in woodland and tall shrubland. It occurs mostly in the southern half of Western Australia and in South Australia (Australian Plants Online, 2003)	Unlikely – Not recorded during field investigation
<i>Sarcozona bicarinata</i>	Ridged Noon-flower	-	V	1	1	5/11/2008	Recorded from the Yorke Peninsula, Eyre Peninsula and Southern Lofty herbarium regions of SA. Flowering: August to December. Recorded in low very open shrubland; Dune bordering saline depression; Saline yellow sands; in sand dunes by road with <i>Atriplex</i> , <i>Acacia</i> , <i>Olearia</i> , <i>Carpobrotus</i> , <i>Eucalyptus socialis</i> mixed mallee; Growing in soil in depression in limestone rock. Comes up after fire. Lives for two years and looks very similar in appearance to <i>Carpobrotus rossii</i> (Native Pigface ).	Unlikely – Not recorded during field investigation
<i>Scutellaria humilis</i>	Dwarf Skullcap	-	R	1	1	24/11/1999	SA: FR MU SL KI. In moist sheltered places such as along creeks or ravines.	Unlikely – Not recorded during field investigation

<i>Swainsona pyrophila</i>	Yellow Swainson-pea	VU	R	3	1,5	25/11/2010	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 (OEH 2020).	Unlikely – Not recorded during field investigation
<i>Tecticornia lepidosperma</i>	0	-	R	1	1	1/01/1998	SA: EP YP SE.	Unlikely – Not recorded during field investigation which was during peak flowering period
<i>Veronica decorosa</i>	Showy Speedwell	-	R	2	1	25/09/2006	SA:FR EA EP NL MU SE. Prefers acid to neutral well drained soils	Unlikely – Not recorded during field investigation which was during peak flowering period
<i>Wurmbea stellata</i>	Star Nancy	-	R	2	1	11/08/2008	<i>Wurmbea stellata</i> is endemic to SA, in arid and semi-arid areas westward from the Flinders Ranges to the Great Victoria Desert and south to the Gawler Ranges, growing in red clay soils on plains or rocky hills, often in exposed sites free of other vegetation. Plants are slender and grow to 10 cm high. They have distinct purplish-green tinted leaves and stem, closely spaced upper leaves and a single star like bicoloured flower (Bates 1995).	Unlikely – Not recorded during field investigation which was during peak flowering period
Source: 1- BDBSA, 2 - AoLA, 3 – Nature Maps 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others NP&W Act; E= Endangered, V = Vulnerable, R= Rare EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable								





Criteria for the likelihood of occurrence of species within the Study area.

<b>Likelihood</b>	<b>Criteria</b>
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.

## 4.3 Cumulative impact

*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.*

All clearance directly required for the development (i.e., the pipeline easement, access tracks and laydowns) have been included in this report.

There will be no subsequent clearance that will be permitted or required for these pipeline renewal sections in the next 100 – 150 years, until the new pipeline deteriorates and requires Renewal. No new building infrastructure for this section required (i.e., pump station already in existence). No extra clearance will be needed for fire protection.

Indirect clearance that may occur because of the development could include dust smothering related impacts to vegetation during construction works. Altered hydrology inundating vegetation may occur if there is a leak in the pipeline. Most of the pipeline repairs will be above-ground, so vegetation will be crushed rather than cleared towards the edges of the clearance area. Hence, tree root zones of trees outside the clearance area are unlikely to be impacted as there should be no ground disturbance.

Further indirect impacts may include spills and leaks of construction vehicles, and damage due to vehicles pulling off track in non-designated areas. Losses from enhanced erosion potential of adjacent construction areas such as gully erosion down watercourses is also possible. These potential impacts are considered in the SA Water Native Vegetation Assessment and Approval Requirements Standard Operating Procedure (SOP) and will be addressed in toolbox talks on-site where possible.

Furthermore, the following controls from the SA Water Native Vegetation Assessment and Approval Requirements SOP will be put in place to ensure invasive weeds are not spread:

- A baseline weed survey of the clearance area has been completed prior to construction to identify locations of existing weed infestations.
- All vehicles and plant, including third parties, will be clean prior to arrival to the site. Weed and seed (plant hygiene) inspections are to be completed for all vehicles and plant on arrival and captured on system as part of Plant Induction.
- Where vehicles are washed down water should be directed to a sump (onsite earthen bunded sumps if possible) and not discharged to stormwater or a watercourse.
- Ensure imported fill is sourced from a designated weed free source.

Future stages of this project will include clearances of similar widths along the pipeline, running between Morgan and Whyalla.

## 4.4 Address 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.**

Native vegetation must be cleared as part of renewal works to ensure a continued water supply between Morgan and Whyalla

The proposed clearance corridors will enable safe operational construction envelopes for the preferred construction equipment required by the construction contractor. This data report presents a worst-case clearance scenario that will be further minimized wherever possible (refer below).

**b) Minimization – 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).**

- The new pipeline is to be constructed as close to the existing pipeline as possible to make use of existing maintenance corridors, access tracks and roads, and to concentrate new disturbance where possible in areas that have been previously disturbed.
- Laydown areas have been selected in areas with minimal vegetation/previously disturbed areas to minimise disturbance to good condition native vegetation.
- All vegetation clearing works will be confined to the clearance areas identified in this report. The boundary of the clearance areas will be clearly demarcated with survey pegs visible to construction personnel. Areas where disturbance is permitted will be familiarized to all site personnel through an induction package.
- The width of the clearance area will be reduced at environmentally sensitive locations as identified through the use of alternate construction methods, for example, to prevent removal of native trees where possible, as per the SA Waters Native Vegetation Assessment and Approval Requirements SOP.
- Branches of trees on the edge of the clearance area, but overhanging into construction / activity areas, will be trimmed as necessary by a qualified arborist to enable safe access. All pruning will be provided with a clean cut.
- Woody vegetation, trees, and hollows to be removed are to be inspected for fauna by a suitably qualified wildlife handler immediately prior to removal. This will include:
  - A walk-through/visual inspection of the habitat to be removed immediately prior to clearance to flush out fauna and capture and relocate.
  - Advice on clearing techniques that minimise fauna impact.
  - Keep records of important fauna interactions, listing the species concerned, the nature of the interaction and GPS coordinates.
  - Hollows and large branches to be reinstated on site prior to site finalisation (or earlier if possible) to provide ongoing habitat for fauna.
- All vehicles and plant, including third parties, will be inspected and be free from plant material and weed propagules prior to arrival to the site. Weed and seed (plant hygiene) inspections are to be completed for all vehicles and plant on arrival and captured on system as part of Plant Induction

**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.**

A construction corridor of 25 m is proposed for construction machinery, only a 12 m clear zone will be required for pipeline placement. Following construction, 15.4 m of the 25 m impact area will be allowed to naturally regenerate. This area will be ripped following construction to allow water intrusion and regeneration of the native seed bank within the topsoil.

Where topsoil is to be cleared, the topsoil will be stockpiled separately and then reapplied post construction to allow for natural regeneration.

**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.

This report outlines the offset responsibilities of MDJV. The offset will be achieved by payment into the fund of an SEB payment of \$36,240.66 plus an Admin fee of \$ \$1,993.24 for a total of \$38,233.90

## 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*.

Table 9: Principle of clearance

Principle of clearance	Relevant information	Assessment against the principles	Moderating factors that may be considered by the NVC															
<b>Principle 1a</b> - Plant species diversity	<u>Relevant information</u> The number of plant species recorded:  VA1 – 25 Native and 3 introduced. VA4 - 30 native and 13 introduced. VA6 - 34 native and 7 introduced. VA7 – 9 Native and 1 introduced.	<u>Seriously at Variance</u> - VA4, VA6	The clearance for the project, as detailed above will be kept to the minimum required to safely install the new pipeline and remove the old. The clearance for the removal of the old pipeline will be rehabilitated while the areas around the new pipeline, excluding the access track, will be allowed to naturally regenerate.															
<b>Principle 1b</b> - <i>significance as a habitat for wildlife</i>	Threatened species that may use the various sections are described in (Table 8)  The Threatened Fauna Score (TFS) and Unit Biodiversity Score (UBS) for each VA is shown below: <table border="1"><tr><td>VA</td><td>TFS</td><td>UBS</td></tr><tr><td>1</td><td>0.1</td><td>48.98</td></tr><tr><td>4</td><td>0.1</td><td>57.08</td></tr><tr><td>6</td><td>0.1</td><td>61.41</td></tr><tr><td>7</td><td>0.1</td><td>34.20</td></tr></table>	VA	TFS	UBS	1	0.1	48.98	4	0.1	57.08	6	0.1	61.41	7	0.1	34.20	All sections are seriously at variance to this principle due to possible habitation by rated fauna listed.	All fauna species identified by the BDBSA and PMST to occur within 50 km of the proposed clearance area have been included in the respective scoresheets.  See for full likelihood of occurrence in Table 8. Based on this assessment, three species in the study area are considered possible, likely, or highly likely to occur in the study area:  <b>Listed species:</b> <ul style="list-style-type: none"><li>• <i>Leipoa ocellata</i> (Malleefowl)</li><li>• <i>Aphelocephala leucopsis</i> (Southern Whiteface)</li><li>• <i>Amytornis textilis myall</i> (Western Grasswren)</li></ul> Therefore, we are seeking moderation to exclude all other species identified as having a known presence within 50 km but are considered unlikely to occur in the study area.
VA	TFS	UBS																
1	0.1	48.98																
4	0.1	57.08																
6	0.1	61.41																
7	0.1	34.20																
<b>Principle 1c</b> - <i>plants of a rare, vulnerable, or</i>	No threatened flora species were recorded. The Threatened Flora Score for all sites is 0.	Not at variance	N/A															

<b>endangered species</b>							
<b>Principle 1d - the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered:</b>	<p>No TECs present within proposed clearance area.</p> <p>Threatened Community Score is 1 for all VAs.</p>	Not at variance	N/A				
<b>Principle 1e - it is significant as a remnant of vegetation in an area which has been extensively cleared.</b>	<p>Remnancy figures for IBRA Association and IBRA Subregion:</p> <table><tr><td><b>IBRA Association percent vegetation remnancy (%)</b></td><td>88</td></tr><tr><td><b>IBRA Subregion percent vegetation remnancy (%)</b></td><td>97</td></tr></table> <p>Total Biodiversity Score – 463.38</p>	<b>IBRA Association percent vegetation remnancy (%)</b>	88	<b>IBRA Subregion percent vegetation remnancy (%)</b>	97	At Variance	Much of the remnant vegetation within the study area is degraded and highly fragment sitting between the busy Lincoln highway, the existing pipeline, and the existing service tracks for the pipeline. There are large tracts of far more intact and less degraded examples of the VA's found in the surrounding area including at nearby Whyalla Conservation Park. It is therefore unlikely that the clearance proposed as part of the application will have a significant impact on good quality habitat across the IBRA region and subregion
<b>IBRA Association percent vegetation remnancy (%)</b>	88						
<b>IBRA Subregion percent vegetation remnancy (%)</b>	97						

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

**Determine the level of risk associated with the application.**

Table 10: Risk Assessment

<b>Total clearance</b>	No. of trees	-
	Area (ha)	8.85
	Total biodiversity Score	463.38
<b>Seriously at variance with principle 1(b), 1(c) or 1 (d)</b>		<b>1(b) – wildlife habitat</b>
<b>Risk assessment outcome</b>		Level 4

# 5. Clearance summary

## Clearance Area(s) Summary table

Table 11: Clearance areas summary table

Block	Site	Native species diversity score	Threatened Ecological community Score	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
1	VA4	30	1	0	0.1	57.08	5.03	287.11	1			301.47	\$26,726.50	\$1,469.96
1	VA6	30	1	0	0.1	63.14	1.05	66.30	1			69.61	\$6,171.40	\$339.43
1	VA7	16	1	0	0.1	34.2	1.67	57.11	1			59.97	\$5,316.58	\$292.41
1	VA1		1	0	0.1	49.0	1.09	53.38	1			56.05	\$4,454.05	\$244.97
								0.00				0.00	\$0.00	\$0.00
								0.00				0.00	\$0.00	\$0.00
								0.00				0.00	\$0.00	\$0.00
								0.00				0.00	\$0.00	\$0.00
								0.00				0.00	\$0.00	\$0.00
						<b>Total</b>		<b>463.9</b>				487.1	\$42668.53	\$2346.77

## Totals summary table

Table 12: Totals summary table

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	463.9	431.05	\$42668.53	\$2346.77	\$45015.30

Table 13: Economies of Scale and Annual Rainfall for BAM sites

Economies of Scale Factor	0.11
Rainfall (mm)	270

Table 14: Economies of Scale and Annual Rainfall for RAM sites

Economies of Scale Factor	0.11
Rainfall (mm)	242



# 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.

## PAYMENT SEB

If a proponent proposes to achieve the SEB by paying into the Native Vegetation Fund, summary information must be provided on the amount required to be paid and the manner of payment:

- An SEB payment of \$42,668.53 plus Admin fee of \$2346.77 for a total of \$45,015.30 is proposed to be paid into the Native Vegetation Fund.

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# 7. Appendices

Appendix 1. Bushland and Rangelands Assessment Method Scoresheets associated with the proposed clearance.

## Appendix 2. Flora Species List

Scientific Name	Common name	EBPC Act Status	NPW Act Status
<i>Acacia ligulata</i>	Umbrella Bush	-	-
<i>Acacia papyrocarpa</i>	Western Myall	-	-
<i>Aizoaceae</i> sp.	Pigface Family	-	-
<i>Amyema quandang</i> var. <i>quandang</i>	Grey Mistletoe	-	-
<i>Asphodelus fistulosus</i> *	Onion Weed	-	-
<i>Atriplex lindleyi</i> ssp.	Baldoo	-	-
<i>Atriplex nummularia</i> ssp.	Old-man Saltbush	-	-
<i>Atriplex spongiosa</i>	Pop Saltbush	-	-
<i>Atriplex stipitata</i>	Bitter Saltbush	-	-
<i>Atriplex vesicaria</i>	Bladder Saltbush	-	-
<i>Austrostipa</i> sp.	Spear-grass	-	-
<i>Avena barbata</i> *	Bearded Oat	-	-
<i>Carpobrotus</i> sp.	Pigface	-	-
<i>Carrichtera annua</i> *	Ward's Weed	-	-
<i>Casuarinaceae</i> sp.	Sheoak Family	-	-
<i>Cenchrus ciliaris</i> *	Buffel Grass	-	-
<i>Convolvulus angustissimus</i>	Narrow-leaf Bindweed	-	-
<i>Conyza bonariensis</i> *	Flax-leaf Fleabane	-	-
<i>Cynodon dactylon</i> *	Couch	-	-
<i>Dissocarpus paradoxus</i>	Ball Bindyi	-	-
<i>Echium plantagineum</i> *	Salvation Jane	-	-
<i>Enchylaena tomentosa</i> var.	Ruby Saltbush	-	-
<i>Enneapogon nigricans</i>	Black-head Grass	-	-
<i>Eremophila longifolia</i>	Weeping Emubush	-	-
<i>Eremophila scoparia</i>	Broom Emubush	-	-
<i>Eremophila</i> sp.	Emubush/Turkey-bush	-	-
<i>Holcus</i> sp.*	Yorkshire Fog	-	-
<i>Lycium ferocissimum</i> *	African Boxthorn	-	-
<i>Maireana appressa</i>	Pale-fruit Bluebush	-	-
<i>Maireana brevifolia</i>	Short-leaf Bluebush	-	-
<i>Maireana georgei</i>	Satiny Bluebush	-	-
<i>Maireana pyramidata</i>	Black Bluebush	-	-
<i>Maireana sedifolia</i>	Bluebush	-	-
<i>Medicago polymorpha</i> *	Burr-medic	-	-
<i>Mesembryanthemum crystallinum</i> *	Common Iceplant	-	-
<i>Myoporum platycarpum</i> ssp.	False Sandalwood	-	-
<i>Nitraria billardieri</i>	Nitre-bush	-	-
<i>Nothoscordum borbonicum</i> *		-	-
<i>Oxalis</i> sp.	Sorrel	-	-
<i>Reichardia tingitana</i> *	False Sowthistle	-	-
<i>Rhagodia</i> sp.	Saltbush	-	-
<i>Rhagodia spinescens</i>	Spiny Saltbush	-	-



<b>Scientific Name</b>	<b>Common name</b>	<b>EBPC Act Status</b>	<b>NPW Act Status</b>
<i>Rhagodia ulicina</i>	Intricate Saltbush	-	-
<i>Rumex vesicarius</i> *	Rosy Dock	-	-
<i>Salsola australis</i>	Buckbush	-	-
<i>Santalum acuminatum</i>	Quandong	-	-
<i>Sclerolaena diacantha</i>	Grey Bindyi	-	-
<i>Sclerolaena patenticuspis</i>	Spear-fruit Bindyi	-	-
<i>Sclerolaena</i> sp.	Bindyi	-	-
<i>Senna artemisioides</i> ssp.	Desert Senna	-	-
<i>Senna artemisioides</i> ssp. <i>petiolaris</i>		-	-
<i>Sida intricata</i>	Twiggy Sida	-	-
<i>Sida petrophila</i>	Rock Sida	-	-
<i>Sisymbrium</i> sp.*	Wild Mustard	-	-
<i>Solanum quadriloculatum</i>	Plains Nightshade	-	-
<i>Tetragonia tetragonoides</i>	New Zealand Spinach	-	-
<i>Vicia</i> sp.*	Vetch	-	-
<i>Vittadinia megacephala</i>	Giant New Holland Daisy	-	-
<i>Vittadinia</i> sp.	New Holland Daisy	-	-

## Appendix 3. NVC correspondence