succession ecology

Native Vegetation Clearance

Lock 5 Proposed Upgrades

Data Report

Clearance under the *Native Vegetation Regulations 2017*

29/03/2023

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1. Application information

1.1 Application details

Applicant:	SA Water		
Key contact:	Tiani Zollo Semmler		
Landowner:	Department of Environment and Water, SA Government		
Site Address:	Lock 5, Paringa		
Local Government Area:	Renmark Paringa Council	**Hundred:**	Paringa
Title ID:	CR5902/306 CT5902/310	Parcel ID	D54003AL100 D54003AL108

1.2 Summary of proposed clearance

Purpose of clearance	Clearance is required to support the construction of a new workshop, concrete hardstand, water treatment plant and drive through space.
Native Vegetation Regulation	Regulation 12, Schedule 1, clause 34, Infrastructure
Description of the vegetation under application	This application includes the clearance of 29 *Eucalyptus* trees. These include: 16 *Eucalyptus largiflorens* 10 *E. camaldulensis var camaldulensis* and; 3 *E. porosa*
Total proposed clearance - area (ha) and number of trees	The proposed clearance is 29 trees.
Level of clearance	Level 4 (escalated from Level 3)
Overlay (Planning and Design Code)	N/A
Mitigation hierarchy	Works cannot be avoided due to the restricted availability of area to develop infrastructure within the Lock 5 lease. Large gum trees along the river's edge will be retained where possible, with the potential to prune rather than remove.
SEB Offset proposal	A payment into the fund of $27,513.50 with an admin fee of $1,513.24

2. Purpose of clearance

2.1 Description

SA Water requires the construction of workshop, a concrete hardstand, a water treatment facility and a drive through space at Lock 5, Paringa. These facilities are required for maintenance services of Lock 5. The site currently has several minor sheds that will be removed in the construction process. The clearance required for these developments will impact on 29 scattered *Eucalyptus* trees.

2.2 Background

Lock 5 Road supports local traffic with surround land use including rural residential and agriculture (livestock). No further development is currently planned for this site. Native vegetation remnancy in the area is 42% and there are two nearby conservation parks, Pike River Conservation Park, approximately 750 m from the site and Cooltong Conservation Park, approximately 12 km to the west.

2.3 General location map

Lock 5 is located between Lock 5 Road and the Murray River, approximately 2 km away from the township of Paringa within the Renmark Paringa Council (Figure 1).

2.4 Details of the proposal

The works will include the construction of a new workshop (22 m x 32 m), a concrete hardstand at the entrance to this workshop (16.3 m x 22 m), a water treatment facility and a drive through space.

2.5 Design

The design is currently in the final stage and is not expected to change. Any changes will be supplied.

2.6 Approvals required or obtained

No other approvals with regards to native vegetation clearance are required.

2.7 Native vegetation regulation

The proposed clearance will be assessed under Regulation 12, Schedule 1, clause 34, Infrastructure.

Figure 1: Location of the proposed works at Lock 5, Paringa. The area in pink displays that area that was surveyed as it will be impacted by development, and the locations of scattered trees that will be impacted are shown.

3. Method

3.1 Flora assessment

- Desktop assessment

Database searches were used to determine the range of threatened flora species and ecological communities, protected under the *Environment Protection and Biodiversity Conservation* (*EPBC*) *Act 1999* and *National Parks and Wildlife (NPW) Act 1972*, that are likely to occur in the area within a 5 km buffer. The search tools used include:

- A Protected Matters Search to identify matters of national significance under the *EPBC Act,* including threatened species and ecological communities.
- A Biological Database of South Australia (BDBSA) search using NatureMaps and Atlas of Living Australia (ALA) to determine flora species recorded within a 5 km radius of the site and species listed under the *NPW Act*.
- Appendices in the NVC Bushland and Scattered Tree Assessment Manuals to determine scattered trees species that provide suitable habitat for threatened fauna and threatened Ecosystems protected under *NPW Act*.
- DEH (in progress) unpublished and provisional list of Threatened Ecosystems to identify threatened and rare ecosystems.

Vegetation types were assessed using satellite imagery and vegetation community data obtained through NatureMaps. All maps were generated using ArcGIS Pro.

- Field survey

Vegetation surveys were conducted on the 16th November, 2022. Vegetation was surveyed using the Scattered Trees Assessment Methodology.

3.2 Fauna assessment

3.2.1 Desktop assessment

A Desktop Assessment was used to determine the range of fauna species that are likely to occur in the area (5 km buffer) and determine whether any threatened fauna may be present. Search tools included:

- A Protected Matters search to identify matters of national significance under the *EPBC Act*, including threatened species.
- A BDBSA search using NatureMaps and ALA to determine fauna species recorded within 5 km radius of the site and species listed under the *NPW Act*.

3.2.2 Field survey

A formal fauna assessment was not carried out for this site; however, an opportunistic observation-based survey was conducted to identify any fauna species using this vegetation as habitat. Opportunistic observations included incidental records of non-target species observed while conducting the specified survey technique, or while walking to or from a survey site.

4. Assessment outcomes

Tree 1 (NT1)
Eucalyptus largiflorens
Number of trees – 1
Height (m) – 13.0
Hollows – 0
Diameter (cm) – 34 (1 stem)
Canopy dieback (%) – 15
Total Biodiversity Score – 1.22

Figure 2: Eucalyptus largiflorens.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 2 (NT2)	
Eucalyptus largiflorens	
Number of trees – 1	
Height (m) – 5.0	
Hollows – 0	
Diameter (cm) – 18 (1 stem)	
Canopy dieback (%) – 15	
Total Biodiversity Score – 0.27	

Figure 3: Eucalyptus largiflorens.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 3 (NT3)	
Eucalyptus largiflorens	
Number of trees – 3	
Height (m) – 16.0	
Hollows – 0	
Diameter (cm) – 46 (1 stem)	
Canopy dieback (%) – 20	
Total Biodiversity Score – 6.92	

Figure 4: Eucalyptus largiflorens.

This tree is in fair condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 4 (NT4)	
Eucalyptus largiflorens	
Number of trees – 9	
Height (m) – 16.0	
Hollows – 0	
Diameter (cm) – 50	
Canopy dieback (%) – 10	
Total Biodiversity Score – 23.11	

Figure 5: Eucalyptus largiflorens.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 5 (NT5)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 18.0	
Hollows – 2	
Diameter (cm) – 82 (1 stem)	
Canopy dieback (%) – 20	
Total Biodiversity Score – 3.70	

Figure 6: Eucalyptus camaldulensis var camaldulensis.

This tree is in fair condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting. This tree has hollows that may provide habitat for fauna species.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 6 (NT6)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 18.0	
Hollows – 2	
Diameter (cm) – 62 (1 stem)	
Canopy dieback (%) – 15	
Total Biodiversity Score – 2.58	

Figure 7: Eucalyptus camaldulensis var camaldulensis.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting. This tree has hollows that may provide habitat for fauna species.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 7 (NT7)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 21.0	
Hollows – 3	
Diameter (cm) – 96 (1 stem)	
Canopy dieback (%) – 10	
Total Biodiversity Score – 4.70	

Figure 8: Eucalyptus camaldulensis var camaldulensis.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting. This tree has hollows that may provide habitat for fauna species.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 8 (NT8)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 20.0	
Hollows – 2	
Diameter (cm) – 100 (1 stem)	
Canopy dieback (%) – 20	
Total Biodiversity Score – 4.32	

Figure 9: Eucalyptus camaldulensis var camaldulensis.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting. This tree has hollows that may provide habitat for fauna species.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 9 (NT9)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 24.0	
Hollows – 0	
Diameter (cm) – 89 (1 stem)	
Canopy dieback (%) – 10	
Total Biodiversity Score – 4.53	

Figure 10: Eucalyptus camaldulensis var camaldulensis.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 10 (NT10)	
Eucalyptus camaldulensis var camaldulensis	*Figure 11:* Eucalyptus camaldulensis var camaldulensis.
Number of trees – 1	
Height (m) – 21.0	
Hollows – 0	
Diameter (cm) – 98 (1 stem)	
Canopy dieback (%) – 10	
Total Biodiversity Score – 4.19	

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 11 (NT11)	
Eucalyptus porosa	
Number of trees – 1	
Height (m) – 14.0	
Hollows – 0	
Diameter (cm) – 38.5 (1 stem)	
Canopy dieback (%) – 10	
Total Biodiversity Score – 3.35	

Figure 12: Eucalyptus porosa.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

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Tree 12 (NT12)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 22.0	
Hollows – 0	
Diameter (cm) – 52 (1 stem)	
Canopy dieback (%) – 30	
Total Biodiversity Score – 1.99	

Figure 13: Eucalyptus camaldulensis var camaldulensis.

This tree is in fair condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 13 (NT13)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 20.0	
Hollows – 1	
Diameter (cm) – 44 (1 stem)	
Canopy dieback (%) – 15	
Total Biodiversity Score – 2.38	

Figure 14: Eucalyptus camaldulensis var camaldulensis.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 14 (NT14)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 19.0	
Hollows – 1	
Diameter (cm) – 115 (1 stem)	
Canopy dieback (%) – 15	
Total Biodiversity Score – 4.03	

Figure 15: Eucalyptus camaldulensis var camaldulensis.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 15 (NT15)	
Eucalyptus porosa	
Number of trees – 1	
Height (m) – 11.0	
Hollows – 0	
Diameter (cm) – 39 (1 stem)	
Canopy dieback (%) – 20	
Total Biodiversity Score – 2.53	

Figure 16: Eucalyptus porosa.

This tree is in fair condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 16 (NT16)	
Eucalyptus porosa	
Number of trees – 1	
Height (m) – 8.0	
Hollows – 0	
Diameter (cm) – 35 (1 stem)	
Canopy dieback (%) – 10	
Total Biodiversity Score – 2.19	

Figure 17: Eucalyptus porosa.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 17 (NT17)	
Eucalyptus camaldulensis var camaldulensis	
Number of trees – 1	
Height (m) – 18.0	
Hollows – 0	
Diameter (cm) – 48.5 (1 stem)	
Canopy dieback (%) – 15	
Total Biodiversity Score – 1.96	

Figure 18: Eucalyptus camaldulensis var camaldulensis.

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Tree 18 (NT18)	
Eucalyptus largiflorens	
Number of trees – 2	
Height (m) – 13.0	
Hollows – 0	
Diameter (cm) – 57 (1 stem)	
Canopy dieback (%) – 5	
Total Biodiversity Score – 4.71	

Figure 19: Eucalyptus largiflorens

This tree is in good condition and together with nearby trees, would provide habitat for small birds, small reptiles, bats and invertebrates, in the form of shelter, perching/roosting, feeding and nesting.

No Threatened ecological communities were present at the site. Eighteen fauna and seven flora species listed as threatened under the *NPW Act* and one fauna species listed as threatened under the *EPBC Act* have been identified in a 5km radius within the last 25 years. Only four species listed as Rare under the *NPW Act* and one EPBC listed species are known to use scattered trees (NVC Scattered Tree Assessment Manual, 2020).

Photo log

Photos of the vegetation community and scattered trees are provided in the descriptions above.

4.2 Threatened species assessment

4.2.1 Threatened ecological communities

No threatened ecological communities were identified as occurring within a 5 km radius of the site.

4.2.2 Threatened fauna

A NatureMaps search identified 18 fauna species threatened under the *NPW Act 1972* as occurring within a 5 km radius of the site in the last 25 years. A Protected Matters search found one species, *Litoria raniformis* (Southern Bell Frog), threatened under both the *NPW Act 1972* and *EPBC Act 1999* as being known or having habitat known to occur within 5 km of the site. Table 1 provides a summary of the likelihood of the species occurring at the site using the metric described in Table 2.

Table 1: A summary of the fauna species observed on site or recorded within 5 km of the application area since 1998.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Anhinga novaehollandiae novaehollandiae (Australasian Darter)	R	-	3	2018	Typical habitat is freshwater or brackish wetlands more than 0.5 m deep with fallen trees or logs and vegetated banks; less commonly, darters are found in inland saltwater environments (iNaturalist 2022).	Unlikely – may use adjacent river habitat but unlikely to be impacted by removal of trees. Minimal logs or fallen trees present within the clearance area.
Ardea intermedia plumifera (Plumed Egret)	R	-	3	2014	Shallow coastal or fresh water, including flooded fields (ALA 2022a).	Unlikely – may use adjacent river habitat but unlikely to be impacted by removal of trees.
Burhinus grallarius (Bush Stone-curlew)	R	-	3	2021	Inhabits grassy woodlands of low, sparse grassy or herb understorey. Prefers habitat covered in fallen timber and debris (Landscape SA 2022).	Unlikely – habitat at the site is unsuitable as there is limited understorey and minimal fallen timber and debris.
Corcorax melanorhamphos (White-winged Chough)	R	-	3	2015	Woodland and tall mallee, with a preference for wetter areas with leaf-litter for feeding and mud for building nests (DEH 2014).	Likely – the habitat is suitable, and the last record is within 10 years.
Coturnix ypsilophora australis (Brown Quail)	V	-	3	2018	Cryptic species that occurs in dense crops (especially oats), irrigated pastures, rank grasslands and sedgelands, especially where native species predominate, and often bordering swamps (DEH 2008a).	Unlikely – habitat at the site is unsuitable with limited understorey that would provide shelter for the species.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Cladorhynchus leucocephalus (Banded Stilt)	V	-	3	2011	Banded Stilts are found mainly in saline and hypersaline (very salty) waters of the inland and coast, typically large, open and shallow (Birdlife Australia 2021a).	Unlikely – habitat at the site is unsuitable.
Entomyzon cyanotis cyanotis (Blue-faced Honeyeater)	R	-	3	2018	The Blue-faced Honeyeater is found in tropical, sub-tropical and wetter temperate or semi-arid zones. It is mostly found in open forests and woodlands close to water, as well as monsoon forests, mangroves and coastal heathlands. It is often seen in banana plantations, orchards, farm lands and in urban parks, gardens and golf courses (Australian Museum 2020).	Likely – the habitat is suitable and has been recorded within the last 10 years.
Haliaeetus leucogaster (White-bellied Sea Eagle)	E	-	3	2016	Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded in (or flying over) a variety of terrestrial habitats (DCCEEW 2022a).	Possible – the site is next to the Murray River (a large area of open water), however they predominately inhabit areas close to the coast.
Ixobrychus dubius (Black-backed Bittern)	E	-	3	2005	Mainly found in freshwater wetlands, where they inhabit dense emergent vegetation of reeds and sedges, and inundated shrub thickets. They are also occasionally found in brackish and saline wetlands such as mangrove swamps, Juncus-dominated salt marsh and the wooded margins of coastal lagoons (ALA 2022b).	Unlikely – the habitat at the site is unsuitable.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Litoria raniformis (Southern Bell Frog)	V	VU	3 & 5	2005	Found in a wide variety of wetland habitats (DEH 2021a).	Unlikely – the habitat at the site is not suitable.
Melanodryas cucullata cucullata (South-eastern Hooded Robin)	R	-	2 & 3	2003	South-eastern subspecies found in Eucalypt woodland and mallee and Acacia shrubland (DEH 2008b).	Possible – habitat is suitable, however last record is from 20 years ago.
Morelia spilota (Carpet Python)	R	-	3	2021	Found in a variety of habitats from wet tropics to semi-arid. Found in undergrowth, tree hollows and rocky crevices (QLD DES 2021).	Likely – the species has broad habitat requirements, and may use the hollows in the Eucalypt trees at the site. The last record is very recent.
Philemon citreogularis citreogularis (Little Friarbird)	R	-	3	2020	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 (Birdlife Australia 2017).	Likely – the habitat at the site is suitable and the last record is very recent.
Plectorhyncha lanceolata (Striped Honeyeater)	R	-	3	2018	Found in forests and woodlands often along rivers (Birdlife Australia 2021b).	Likely – the habitat at the site is suitable, and the last record is recent.
Plegadis falcinellus (Glossy Ibis)	R	-	3	2017	Preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons (DCCEEW 2022b).	Likely – the habitat at the site is suitable, and the last record is recent.
Polytelis anthopeplus monarchoides (Regent Parrot)	V	Vu	3	2013	Habitats include Eucalyptus camaldulensis, floodplain, woodland and mallee (DEH 2021b).	Likely – the habitat at the site is suitable and has been recorded within the last 10 years.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
Spatula rhynchotis (Australasian Shoveler)	R	-	3	2015	Shovelers are found in shallow wetlands with abundant emergent vegetation throughout the wetter south and east of the state, and on ephemeral lakes and wetlands inland. They can be found on freshwater, brackish and saline waters including inshore waters and estuaries (Birds SA 2022).	Possible – they may utilise the adjacent river, however are more often found in shallow wetlands.
Trichosurus vulpecula (Common Brushtail Possum)	R	-	3	2003	Inhabits woodland, forests, heath and urban areas using trees with hollows for nesting (Australian Museum 2022).	Likely – the site provides suitable habitat for the species, in particular large gums with hollows that provide shelter.
Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps, 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						

Table 2: Criteria for the likelihood of occurrence of species within the survey area.

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

4.2.3 Threatened flora

Seven flora species threatened under the *NPW Act 1972* were recorded as occurring within a 5 km radius of the site in a NatureMaps search. A 5 km Protected Matters search did not identify any flora species threatened under the EPBC Act 1999 as being known or having habitat know to occur within the area. Table 3 provides a summary of the likelihood of the species occurring at the site using the metric described in Table 2.

Table 3: A summary of the flora species observed on site or recorded within 5km of the application area since 1998.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments (Table 2)
Brachyscome paludicola (Swamp Daisy)	R	-	3	2003	Grows on swampy ground (PlantNet 2022).	Unlikely – habitat is unsuitable and was last recorded 20 years ago.
Calotis scapigera (Tufted Burr-daisy)	R	-	3	2020	Found on heavy clay soils prone to inundation, including River Murray floodplains (Royal Botanic Gardens 2022).	Possible – habitat is suitable and recent record within the area, however the area is disturbed and survey effort considered adequate to identify species.
Elatine gratioloides (Waterwort)	R	-	3	2003	Grows in wet places and fresh water usually less than 30 cm deep (Electronic Flora of SA 2022).	Possible – habitat is suitable, however was last recorded 20 years ago.
Goodenia heteromera (Spreading Goodenia)	R	-	3	2020	On periodically flooded river banks and flats (Electronic Flora of SA 2007).	Possible – habitat is suitable and recent record within the area; however the area is disturbed and survey effort considered adequate to identify species.
Maireana pentagona (Slender Fissure-plant)	R	-	3	2020	Heavy, seasonally wet, alluvial clays of the Murray River floodplain (VicFlora 2019).	Possible – habitat is suitable and recent record within the area, however the area is disturbed and survey effort considered adequate to identify species.
Myoporum parvifolium (Creeping Boobialla)	R	-	3	2020	Scattered mainly across northern and western Victoria in clay soils, often on saline flats (VicFlora 2018).	Unlikely – habitat is unsuitable.
Picris squarrosa (Squat Picris)	R	-	3	2002	Coastal dunes, river alluvium and disturbed ground (Electronic Flora of SA 2021).	Possible – habitat is suitable, however was last recorded over 20 years ago.

Species (common name)	NPW Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments (Table 2)
Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps 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						

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.

The removal of large Eucalyptus trees will contribute to a gradual decline in remnant native vegetation, a loss of habitat connectivity and a decrease in available habitat for native flora and fauna species within the region. Vegetation remnancy in the area is 42% and given the relatively small number of trees that will be removed it is not expected that this will have a significant impact on cumulative impact within this region. Further, the site is already disturbed through prior construction and maintenance of Lock 5, with the main vegetation to be cleared (aside from the Eucalypts) being non-native and planted native understorey. No foreseeable developments are likely to occur at the site, therefore it is unlikely there will be further major impacts to the remaining surrounding vegetation.

Further, appropriate management actions will be taken to reduce the indirect impacts of this development on the adjacent river habitat. SA Water understand the importance of vegetation, specifically large Eucalypt trees, in river stabilisation, and as such will mitigate against erosion.

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.

- Avoidance – outline measures taken to avoid clearance of native vegetation

The proposed clearance is required to construct facilities that are needed for maintenance purposes, which is necessary for the public as an SA Water site. As such, there is not an option to avoid impacts. Further, there is minimal space available on the Lock 5 lease to adjust the locations of infrastructure required for these works.

Although a number of large *Eucalyptus* trees will be impacted during the process, there are still many *Eucalypts* within the vicinity that will remain. No threatened species were recorded at the site, and there is limited understorey as the area has already been degraded by previous construction works.

- 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).

A detailed site assessment has been undertaken and incorporated into the planning of infrastructure works to ensure the minimum amount of vegetation disturbance. Large gum trees along the river's edge will be retained where possible, with the potential to prune rather than remove.

- 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.

Due to the small nature of the impact zone and considering the continuous disturbance of this area through infrastructure and traffic, it is not practical to rehabilitate or restore native vegetation in this area. During the construction process, non-native species will also be removed, contributing to the improvement of vegetation in the area.

- 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.

SA Water will contribute an SEB payment into the Native Vegetation fund to support restoration and conservation works in the region.

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.

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*.

Principle of clearance	Relevant information	Assessment against the principles	Moderating factors that may be considered by the NVC
Principle 1b - significance as a habitat for wildlife	Threatened species identified in this area within the last 25 years that are likely to use the site: • Corcorax melanorhamphos (White-winged Chough) • Entomyzon cyanotis cyanotis (Blue-faced Honeyeater) • *Morelia spilota* (Carpet Python) • Philemon citreogularis citreogularis (Little Friarbird) • Plectorhyncha lanceolata (Striped Honeyeater) • Plegadis falcinellus (Glossy Ibis) • Polytelis anthopeplus monarchoides (Regent Parrot) • *Trichosurus vulpecula* (Common Brushtail Possum) Trees Fauna Habitat Score: = 1.8 Total Biodiversity Score: = 78.68	Seriously at Variance All trees	The removal of these scattered trees is not expected to have a significant impact on these fauna species as the area already highly developed and the habitat is represented only by a few scattered trees and planted understorey. Further, there will still be a many large Eucalyptus trees within the vicinity that will still be available to be utilised by fauna species. The clearance is not expected to impact: • population size, extent, structure, continuity, or survivability • the area of occupancy of a species • habitat critical to the survival of a species • recovery of a species • presence of invasive species
Principle 1c - plants of a rare, vulnerable or endangered species	No Threatened species identified in this area within the last 25 years are likely to use the site. Threatened Flora Score = 0	Not at Variance	N/A
***Principle 1d - the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered*:**	Threatened communities None Threatened Community Score =1	Not at Variance	N/A

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

Total clearance	No. of trees	29
	Area (ha)	-
	Total biodiversity Score	78.68
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1(b)
Risk assessment outcome		Level 4

4.7 NVC guidelines

Provide any other information that demonstrates that the clearance complies with any relevant NVC guidelines related to the activity.

N/A

5. Clearance summary

Scattered trees summary table

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Total Biodiversity score	Loss factor	SEB Points required	SEB Payment	Admin Fee
NT1	1	1.8	0	1.22	1.0	1.28	$449.01	
NT2	1	1.8	0	0.27	1.0	0.29	$100.51	
NT3	3	1.8	0	6.92	1.0	7.26	$2,539.51	
NT4	9	1.8	0	23.11	1.0	24.26	$8,483.64	
NT5	1	1.8	0	3.70	1.0	3.88	$1,356.98	
NT6	1	1.8	0	2.58	1.0	2.71	$946.81	
NT7	1	1.8	0	4.70	1.0	4.94	$1,725.95	
NT8	1	1.8	0	4.32	1.0	4.54	$1,587.54	
NT9	1	1.8	0	4.53	1.0	4.76	$1,664.71	
NT10	1	1.8	0	4.19	1.0	4.40	$1,537.71	
NT11	1	1.8	0	3.35	1.0	3.52	$1,231.67	
NT12	1	1.8	0	1.99	1.0	2.09	$731.98	
NT13	1	1.8	0	2.38	1.0	2.50	$873.83	
NT14	1	1.8	0	4.03	1.0	4.23	$1,479.68	
NT15	1	1.8	0	2.53	1.0	2.66	$928.47	
NT16	1	1.8	0	2.19	1.0	2.30	$804.07	
NT17	1	1.8	0	1.96	1.0	2.06	$720.15	
NT18	2	1.8	0	4.71	1.0	4.94	$1,728.03	
				78.68		**82.62**	**$27,513.50**	**$1,513.24**

*Note that SEB Payment values for individual trees, as calculated by the NVC Scattered Tree Assessment Scoresheet (PSS Sheet), do not equal the same total as that provided in the summary in the same scoresheet (SEB Sheet). Given this, the totals provided in the SEB Sheet have been used.

Total summary table

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	78.68	82.62	$27,513.50	$1,513.24	$29,026.74

Economies of Scale Factor	0.5
Rainfall (mm)	249

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.

7. References

ALA. 2022a. Ardea intermedia plumifera (Plumed Egret).

ALA. 2022b. Ixobrychus dubius (Australian Little Bittern).

Australian Museum. 2020. Blue-faced Honeyeater (Entomyzon cyanotis).

Australian Museum. 2022. Species Profile: Trichorurus vulpecula, Common Brushtail Possum.

Birdlife Australia. 2017. Little Friarbird (Philemon citreogularis).

Birdlife Australia. 2021a. Species Profile: Cladorhynchus leucocephalus, Banded Stilt.

Birdlife Australia. 2021b. Species Profile: Plectorhyncha lanceolata, Striped Honeyeater.

Birds SA. 2022. Species Profile: Spatula rhynchotis, Australasian Shoveler.

DCCEEW. 2022a. Species profile: White-Bellied Sea Eagle, Haliaeetus leucogaster.

DCCEEW. 2022b. Species Profile and Threats Database. Plegadis falcinellus (Glossy Ibis).

DEH. 2008a. Threatened Species Profile: Coturnix ypsilophora, Brown Quail.

DEH. 2008b. Threatened Species Profile: Melanodryas cucullata cucullata (South-eastern Hooded Robin).

DEH. 2014. AMLR Threatened Species Profile: Corcorax melanorhamphos, White-winged Chough.

DEH. 2021a. Fact Sheet: Frogs, Litoria raniformis, Southern Bell Frog.

DEH. 2021b. Threatened Species Profile: Polytelis anthopeplus monarchoides, Regent Parrot.

Electronic Flora of SA. 2007. Species Fact Sheet: Goodenia heteromera (Spreading goodenia).

Electronic Flora of SA. 2021. Species profile: Picris squarrosa, Squat Picris.

Electronic Flora of SA. 2022. Species Profile: Elatine gratioloides, Waterwort.

iNaturalist. 2022. Australasian Darter Anhinga novaehollandiae.

Landscape SA. 2022. Fact Sheet: Bush Stone-curlew, Burhinus grallarius.

PlantNet. 2022. Species Profile: Brachyscome paludicola, Swamp Daisy.

QLD DES. 2021. Species Profile: Morelia spilota, Carpet Python.

Royal Botanic Gardens, V. 2022. Species Profile: Calotis scapigera, Tufted Burr-daisy.

VicFlora. 2018. VicFlora – Myoporum parvifolium. https://vicflora.rbg.vic.gov.au/flora/taxon/5aebedb0-820a-4d0d-8aa5-8bb2364b0d9d.

VicFlora. 2019. Maireana pentagona (Hairy Bluebush).

8. Appendices

Appendix 1: Scattered tree assessment scoresheets associated with the proposed clearance.

Appendix 2: Site maps as shape files.

Appendix 3: Species Searches (NatureMaps and PMST).