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Native Vegetation Clearance

VS 2022/21 Hog Bay Road Junction Arronmore and Elsegood Roads Kangaroo Island Junction Upgrade Project

Data Report

Clearance under the *Native Vegetation Regulations 2017*

14 July 2022

Prepared by JS Ayre & Associates

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1. Application information

Application Details

Applicant:	Department for Infrastructure and Transport		
Key contact:			
Landowner:	The Crown		
Site Address:	Junctions of Hog Bay Road with Arronmore Road and Elsegood Road, Kangaroo Island		
Local Government Area:	Kangaroo Island Council	Hundred:	Menzies
Title ID:	CT/5550/666 (part) and road reserve	Parcel ID	F180916 A884 (part) and road reserve

Summary of proposed clearance

Purpose of clearance	Clearance is required for the realignment of Hog Bay Road in the vicinity of two junctions
Native Vegetation Regulation	Regulation 12, Schedule 1; clause 32, Works on behalf of Commissioner of Highways
Description of the vegetation under application	<u>Size, type and general condition</u> – 1.04 ha of KI Narrow-leaved Mallee (<i>Eucalyptus cneorifolia</i>) Mallee Woodland in fair condition
Total proposed clearance	1.04 ha is proposed to be cleared.
Level of clearance	Level 4
Overlay (Planning and Design Code)	Native Vegetation Overlay and State Significant Native Vegetation Overlay

Map of proposed clearance area



Mitigation hierarchy	Several concepts were developed which required greater impact. The concept ultimately selected, achieves a significant reduction in clearance of vegetation.
SEB Offset proposal	Payment of \$34,681.38

2. Purpose of clearance

2.1 Description

Clearance is required to facilitate the construction of an improved alignment of Hog Bay Road, Arronmore Road and Elsegood Road junctions, located at Cygnet River/Nepean Bay, Kangaroo Island. The current layout gives priority to traffic on Elsegood Road, which has potential to cause traffic conflicts as Hog Bay Road is the main arterial road at this location.

2.2 Background

Hog Bay Road is the main arterial road providing the main transport link between the town of Kingscote and Penneshaw where the ferry port is located. The site is mostly on road reserve, but some land acquisition of part of the property to the east of the site will be required. This property is zoned Coastal Conservation, and currently used for grazing. It is primarily cleared except for a narrow (c.20m) fringe of native vegetation adjacent road reserve.

Associated with this project is the upgrade of Hog Bay Road, from Playford Highway to Penneshaw, which will involve shoulder sealing, some curve widening, culvert upgrades, guard rail installation and an overtaking lane; some of this work will impact native vegetation. These impacts are the subject of separate assessments (in progress).

2.3 General location maps



Figure 1. Site in context



Figure 2. Approximate boundary of impact including batters and sight distance requirements

2.4 Details of the proposal

The current alignment of the site is described as a staggered T-junction, with the local collector road (Elsegood Road) having priority passage through the junction. This has potential to cause confusion as drivers on Hog Bay Road assume priority over more minor roads. The issues associated with traffic priority at the site were investigated in 2012, but not progressed beyond concept identification.

In 2021 Greenhill were engaged to review the 2012 concepts¹ and develop a revised concept which addressed the shortcomings of the current junctions layout. The original concepts required significant impact to native vegetation; Greenhill's designs were further reviewed by Fyfe in order to reduce impacts, which are now confined largely to cleared or degraded vegetation adjacent the shoulder, and narrow strips of Kangaroo Island Narrow-leaved Mallee Low Woodland on road reserve or private land.

The estimated area of impact includes batters and sight distance requirements shown in the latest design (Figures 3 and 4 below), and contractor's activity zones during construction.

¹ Greenhill 2021; *Concept Report , Hog Bay Road Junctions Upgrade, Kangaroo Island* (Rev B) for DIT

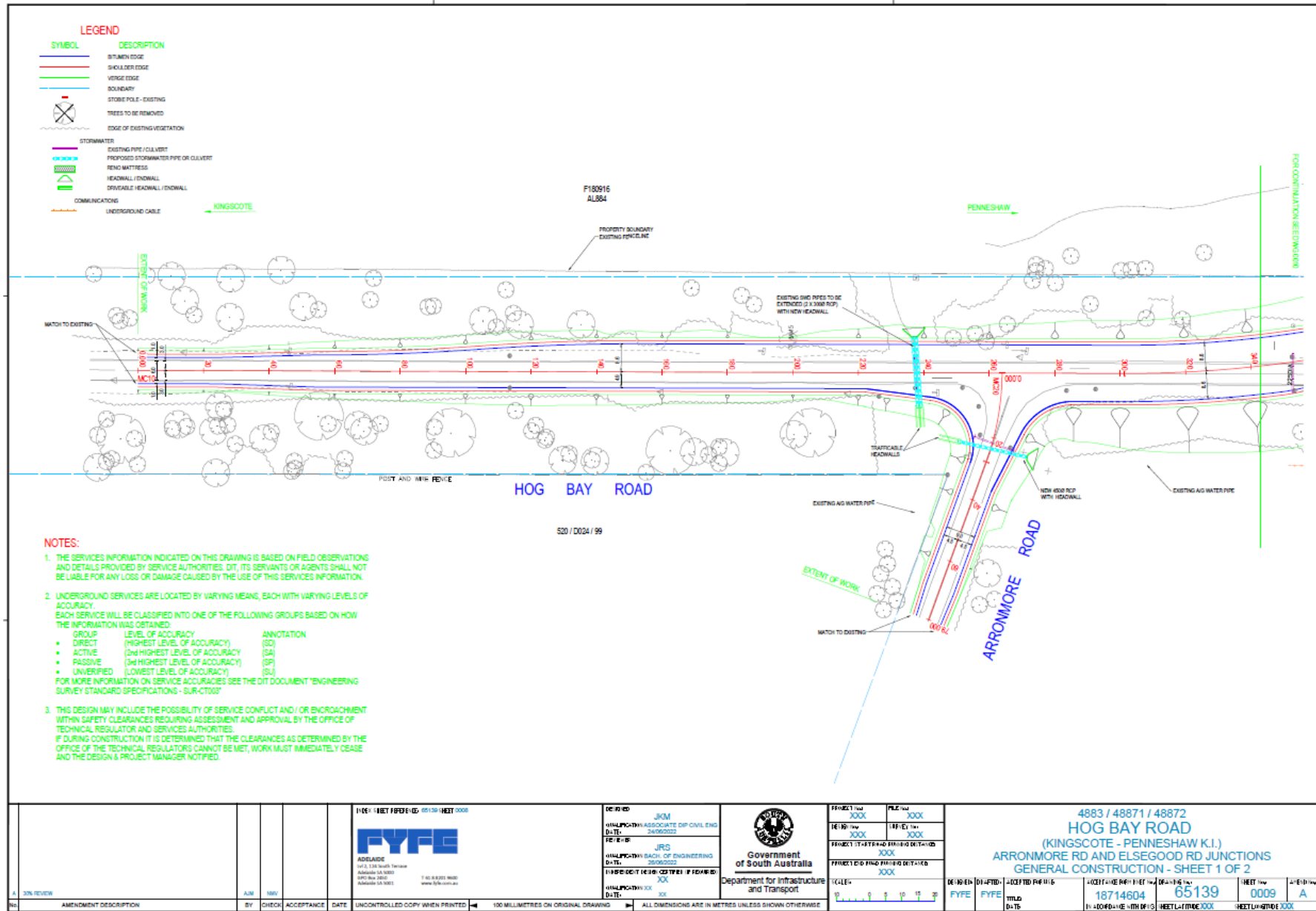
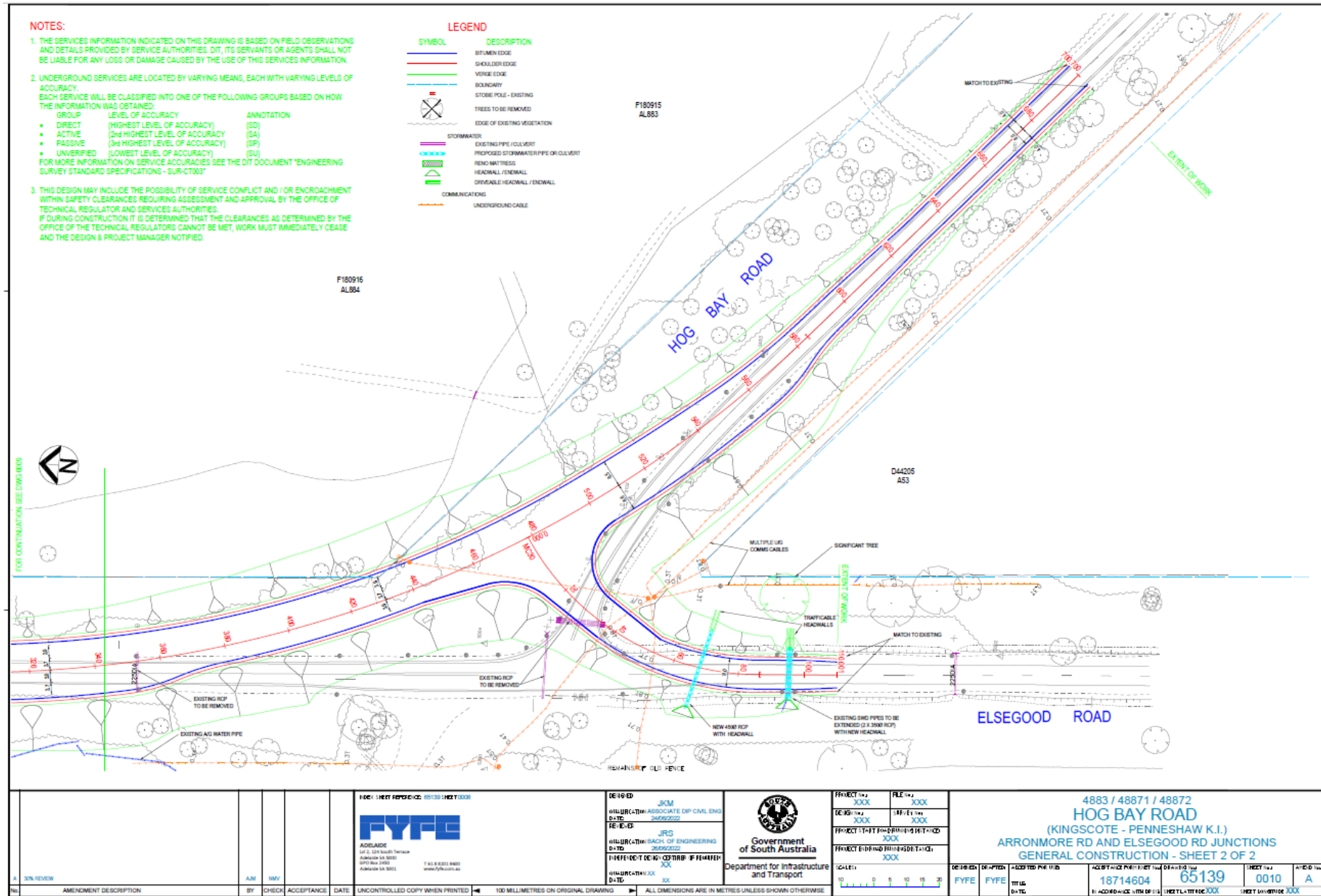


Figure 3. Revised concept Part A, at 14 July 2022, the basis for this assessment



2.5 Approvals required or obtained

- Native Vegetation Act 1991 – an application to clear is required. This report is in part fulfilment of that requirement.
- National Parks and Wildlife Act 1972 (e.g. flora collection permit) – a fauna assessment was undertaken by an authorised collector.
- Aboriginal Heritage Act 1988 – work will be mainly within the previously disturbed shoulder and verge and is not considered to pose a high risk of encountering Aboriginal sites or objects. The Departmental SOP is a guideline for the assessment and management of Aboriginal objects, sites and remains, should any be disturbed during construction of infrastructure projects or maintenance activities. This will be provided to all contractors.

2.6 Native Vegetation Regulation

Regulation 12, Schedule 1; clause 32, Works on behalf of Commissioner of Highways – clearance of vegetation incidental to new work being undertaken; and in accordance with an NVC-approved SOP.

2.7 Development Application information (if applicable)

Native Vegetation Overlay and State Significant Native Vegetation Overlay.

3. Method

3.1 Flora assessment

A desktop review of listed species records was undertaken prior to the site visit. The scope of works was outlined by the client and informed by research using NatureMaps and Google Earth street view. The site assessment was conducted on 13 June 2022 and consisted of a transect walked for the majority of the length of the impact site, and of borders where impact was confined to road reserve. It used the Bushland Assessment method, including identification of possible habitat for species of conservation significance.

An online search was undertaken for Environment Protection and Biodiversity Conservation (EPBC) Act "Matters of Environmental Significance" and an interrogation of the Atlas of Living Australia (AoLA) and the BDBSA databases identified 23 threatened plant species recorded in the area (within 5km and since 1995). None of the listed species were found on site, and whilst three seasonally occurring Orchid species and one grass species may occur within the area assessed, it is considered unlikely that they are present given the degree of disturbance at the site. See part 4.2 and Appendix 1 for further details.

3.2 Fauna assessment

Initial desktop assessment including the EPBC Act "Matters of Environmental Significance", AoLA and BDBSA revealed records of 19 threat rated species within a corridor extending five kilometres either side of the road at the junctions. However, due to the proximity of significant sections of the road to the sea, many of these are oceanic, shoreline or waterbird species which can be excluded from the assessment.

Opportunistic observations were made by vegetation assessors during the site assessment on 13 June 2022. A dedicated fauna survey was undertaken by Dave Armstrong between June 13 – 20 2022. Two threatened species were recorded during field surveys (but not identified in the search criteria). Minimal disturbance, indirect methods were considered as the best option for obtaining a comprehensive understanding of the fauna present at the location. Methodology included:

- searching larger representative samples of the major native vegetation associations, recording observations, tracks and traces and any other signs of all vertebrate species present. To provide a systematic approach, sampling is to occur over one hour within a 100m long by 50m deep plot adjacent to the road junction upgrade area, as described in the scope of works. Particular attention was to be focused on recording significant tree hollows and inspecting dense thickets which may provide sheltered day time rest sites for macropods,
- spotlighting at each of these sights for approximately 30 minutes, to confirm if possible the presence of nocturnal active species indicated by the diurnal inspection, and other species not anticipated, plus nocturnal bird species which are difficult to find during the day
- opportunistic recording of species observed along the roadside whilst carrying out the systematic surveys described above, supplemented with short stops at less significant areas of roadside vegetation as necessary.

See Part 4.2 and Appendix 1 for further details.

4. Assessment Outcomes

4.1 Vegetation Assessment

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

- *Landform, geography and soils*
Cygnet River land System - low lying alluvial and colluvial plains and valley flats. Tributaries of the Cygnet River area included in the system. The area is bordered by slopes and rises to the northwest and south and by low lying saline coastal plains to the east.
- *Landform feature of significance (rivers, creeks, rocky outcrops, etc.)*
The site is dominated by plains with riverbeds and depressions and low relief overall. No significant landform features such as rock outcrops or rivers/creeks occur.
- *General overview of the vegetation under application as a whole (e.g. contains x number of vegetation associations / trees)*
The vegetation association is described as *Eucalyptus cneorifolia* (KI Narrow-leaved Mallee) Low Mallee Woodland with *Melaleuca halmaturorum* over chenopods.
- *General description of the vegetation relating to type and condition*
The association occurs on both sides of Hog Bay Road, and the two roads which form T-junctions with the main road. It is disturbed and degraded and varies in species dominance and density, especially close to the junctions.
- *Provide a description of the landscape context for the vegetation*
The vegetation is fragment of a consistent strip of remnant vegetation fringing roadsides across much of the eastern part of the island. In many places it adjoins or forms linkages to larger remnant patches, some of which are conserved in Heritage Agreements or National Parks properties. Cygnet River Estuary CP, Nepean Bay CP, and two HA's are within 5km of the site.

Details of the vegetation association proposed to be impacted

Vegetation Association	Vegetation Association 1; <i>Eucalyptus cneorifolia</i> (KI Narrow-leaved Mallee) Low Woodland.
	
Photo 1. Facing northeast over the denser part of the association. The edge of the site near the road shoulder will be impacted.	



Photo 2. Facing north, over the small patch of dense *M. halmaturorum* present amongst the association. Elsewhere, the Swamp Paperbark is less dense and represented by scattered individuals or small clumps.

General description	<i>E. cneorifolia</i> dominates the association on the LHS (eastern side) of Hog Bay Road, with density decreasing on the RHS. Parts of the site consist of grassy exotic weed species; these have not been included in the area calculation. The area calculation is based on the worst case scenario, to account for final design changes and contractors activity zones. Actual impacts are likely to be less. The site is infiltrated by weeds including Bridal Creeper. Human activity was noted; the site appears to be an informal 'toilet stop'.				
Threatened species or community	Nineteen listed fauna species were recorded within 5km since 1995, with all but 6 excluded due to non-suitable habitat. Two threatened fauna species - Peregrine Falcon and Short-beaked Echidna - were recorded during field surveys (but not identified in the search criteria). Although not observed on site, there is potential for the existence of threatened species including Fox-tail Spear-grass and three <i>Caladenia</i> species which are listed as occurring within the search criteria. However, the understorey layer is quite degraded, and the presence of threatened species is considered unlikely. The impact is mainly to more disturbed edges where threatened species are unlikely to have survived.				
Landscape context score	1.17	Vegetation Condition Score	36.98	Conservation significance score	1.10
Unit biodiversity Score	47.59	Area (ha)	1.04	Total biodiversity Score	49.49

Site map showing areas of proposed impact



Figure 3. Vegetation Association 1, approximate areas impacted, outlined in yellow

4.2 Threatened Species assessment

Species observed on site, or recorded within 5km (50km in the arid zone) of the application area since 1995, or the vegetation is considered to provide suitable habitat

Species (common name)	NP&W Act	EPBC Act	Data source	Date of last record	Species known habitat preferences	Likelihood of use for habitat – Comments
<i>Calyptrorhynchus lathamii halmaturinus</i> Glossy Black-Cockatoo (Kangaroo Island subspecies)	E	EN	3	2017	Found in woodland dominated by Sheoaks and open forests with Sheoak forming a substantial middle layer. Sugar, Blue and Manna Gum provide suitable nesting habitat	Possible – habitat specific requirements are not met at the site
<i>Neophema petrophila zietzi</i> Rock Parrot		R	3	2012	Restricted to coastlines and offshore rocky islands, frequenting windswept coastal dunes, mangroves, saline swamps and rocky islets. Seldom seen more than a few hundred metres from the sea	Possible – habitat specific requirements are not met at the site
<i>Oriolus sagittatus sagittatus</i> Olive-backed Oriole		R	3	1996	Forests and woodlands; well-treed urban areas, particularly parks and golf courses	Possible, although no recent records exist
<i>Stagonopleura bella samueli</i> Beautiful Firetail (MLR, KI)		SP	3	2012	Likely inhabits shrubland and woodland, esp with Sheoaks, paperbarks, tea-trees. Also likely to inhabit eucalypt woodlands and forests with a shrubby/heathy understory. Areas near watercourses, swamps, and marshes support the highest density of individuals. Low shrubby habitats such as grasslands, heathlands and sedgeland also provide possible habitat for the subspecies.	Likely – habitat requirements could be met at the site
<i>Zanda funerea whiteae</i> Yellow-tailed Black Cockatoo		V	3	2015	Stringybark forest and woodland, with Sheoaks, Banksias and Hakeas. Plantation Pine forests and individual Pines	Highly likely – commonly seen in the vicinity during travel to survey site (but not within the site)

<i>Isoodon obesulus obesulus</i> Southern Brown Bandicoot (SA mainland and KI)	EN	V	5	2007	Known to be present in a variety of habitats including heathland, shrubland, sedgeland, heathy open forest and woodland and are usually associated with infertile, sandy and well drained soils, but can be found in a range of soil types	Likely – suitable habitat and records within 5km support the occurrence
<i>Falco peregrinus</i> Peregrine Falcon		R	4	2022	Found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings.	Known – observed during the survey period (June 2022)
<i>Tachyglossus aculeatus multiaculeatus</i> Short-beaked Echidna KI	EN	E	4	2022	Usually found in open heathland, forests, woodlands, scrublands and grasslands, among vegetation or in hollow logs. In poor weather, they will often shelter under bushes or burrow into the soil.	Known – observed during the survey period (June 2022)
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						

Criteria for the likelihood of occurrence of species within the Study 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 provide 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 provide 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

The cumulative impacts must consider all the clearance that is likely to result from the application, including the following;

- clearance directly required for the development (e.g. access, building footprints, associated infrastructure – power and water, etc.),
These impacts have been included in the total impact for the junction upgrade. Stack sites are yet to be nominated but potential sites for the broader Hog Bay Road upgrade project, with minimal or degraded native vegetation present, have been reviewed as a preliminary action.
- subsequent clearance that will be permitted or required (e.g. 10m around a building, 20m around a dwelling, clearance for fire protection),
Not applicable to this type of development.
- indirect clearance that may occur as a result of the development (e.g. dust generation smoothing vegetation, altered hydrology inundating or drying vegetation, impacting on tree root zones (the application of fill) impacting on tree health)
All such impacts have been included in the assessment. Environmental management methods will be employed during construction to minimise these impacts.,
- future stages or associated components of a development.
The project is part of an upgrade of the length of the Hog Bay Road from (near) Kingscote to Penneshaw. The impacts associated with other stages are subject to separate vegetation assessments (in progress).

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

Several concepts were investigated and assessed with regard to meeting design criteria and vegetation impacts. The concept design subject to this assessment has the least vegetation impacts. The scale and impact of the design is the lesser of all but one of the options, which was discounted due to – amongst other things – failing to achieve the required safety improvements.

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 design is located largely where the least vegetation, or the most degraded vegetation exists, as much as is feasible whilst meeting design and safety criteria.

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.

Clearance is permanent but the old road surface may be ripped to encourage regeneration of native vegetation.

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 appropriate SEB will be achieved via payment into the fund.

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	See Appendix 1. and Part 4.2 for details of threatened fauna species that were recorded or may use the vegetation. Patches; Threatened Fauna Score 0.1 Unit biodiversity Score 49.49	<u>Seriously at Variance</u> Vegetation Association 1 <u>At Variance</u> N/A	Impact significance Non-essential habitat
Principle 1c - plants of a rare, vulnerable or endangered species	See Appendix 1. and Part 4.2 for details of threatened flora species that were recorded or may be present but not evident at the time of survey. Although not observed on site, there is potential for the existence of threatened species including Fox-tail Spear-grass and three Caladenia species which are listed as occurring within the search criteria. However, the understorey layer is quite degraded and the presence of threatened species is considered unlikely. The impact is mainly to more disturbed edges where threatened species are unlikely to have survived. Threatened Flora Score(s) 0	<u>Seriously at Variance</u> N/A <u>At Variance</u> N/A	
Principle 1d - vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered:	KI Narrow-leaved Mallee (<i>Eucalyptus cneorifolia</i>) Woodland is an EPBC listed threatened community. The vegetation association present is not considered to meet the criteria for this threatened community. The vegetation does not represent an ecosystem listed in the DEW Provisional list of threatened ecosystems. Threatened Community Score 1	<u>Seriously at Variance</u> N/A	

4.6 Risk Assessment

Determine the level of risk associated with the application

Total clearance	No. of trees	N/A
	Area (ha)	1.04
	Total biodiversity Score	49.49
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1(b)
Risk assessment outcome		Level 4

5. Clearance summary

Clearance Area(s) Summary table

Block	Site	Sp diversity score	Threatened Ecological com Score	Threatened plant score	Threatened fauna score	UBS	Area (ha)	Total Biodiversity score	Loss factor	Loadings	Reductions	SEB Points required	SEB payment	Admin Fee
A	1	15	1	0	0.1	47.59	1.04	49.49	1	0	0	51.96	32,873.35	1808.03
						Total	1.04	49.49				51.96	\$32,873.35	\$1808.03

Totals summary table

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	49.49	51.96	\$32,873.35	\$1808.03	\$34,681.38

Economies of Scale Factor	0.5
Rainfall (mm)	473

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:

☒ 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:

- Payment amount required (including admin. fee) **\$34,681.38**

7. Appendices

Appendix 1. Flora and Fauna Species List

CLASS NAME	SPECIES	COMMON NAME	NATIONAL RATING	STATE RATING	DATE OF LAST RECORD
AVES	<i>Arenaria interpres interpres</i>	Ruddy Turnstone		R	11-Feb-2012
AVES	<i>Biziura lobata menziesi</i>	Musk Duck		R	30-Nov-2012
AVES	<i>Calidris canutus rogersi</i>	Red Knot (ssp. rogersi)	sp	E	13-Nov-2011
AVES	<i>Calidris tenuirostris</i>	Great Knot	CR	E	13-Nov-2011
AVES	<i>Calyptorhynchus lathami halmaturinus</i>	Glossy Black-Cockatoo (Kangaroo Island subspecies)	EN	E	10-Apr-2017
AVES	<i>Charadrius leschenaultii leschenaultii</i>	Greater Sand Plover	sp	R	30-Nov-2012
AVES	<i>Egretta garzetta nigripes</i>	Little Egret		R	30-Nov-2012
AVES	<i>Haematopus fuliginosus fuliginosus</i>	Sooty Oystercatcher		R	11-Feb-2012
AVES	<i>Haematopus longirostris</i>	Pied Oystercatcher		R	16-Nov-2014
AVES	<i>Limosa lapponica baueri</i>	Bar-tailed Godwit	VU	ssp	06-Jun-2010
AVES	<i>Limosa limosa melanuroides</i>	Black-tailed Godwit		R	07-Feb-2010
AVES	<i>Neophema petrophila zietzi</i>	Rock Parrot		R	30-Nov-2012
AVES	<i>Oriolus sagittatus sagittatus</i>	Olive-backed Oriole		R	01-Oct-1996
AVES	<i>Spatula rhynchotis</i>	Australasian Shoveler		R	08-Mar-2009
AVES	<i>Stagonopleura bella samueli</i>	Beautiful Firetail (MLR, KI)		SP	30-Nov-2012
AVES	<i>Stictonetta naevosa</i>	Freckled Duck		V	01-Jun-2003
AVES	<i>Thinornis cucullatus cucullatus</i>	Hooded Plover	VU	V	16-Nov-2014
AVES	<i>Zanda funerea whiteae</i>	Yellow-tailed Black Cockatoo		V	17-Aug-2015
MAMMALIA	<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (SA mainland and KI)	EN	V	18-May-2007

Shaded species excluded due to no suitable habitat

FAMILY NAME	SPECIES	COMMON NAME	NATIONAL RATING	STATE RATING	DATE OF LAST RECORD
COMPOSITAE	Olearia microdisca	Small-flower Daisy-bush	EN	E	12-Mar-2021
COMPOSITAE	Olearia pannosa ssp. pannosa	Silver Daisy-bush	VU	V	20-Sep-2010
CRASSULACEAE	Crassula exserta	Large-fruit Crassula		R	02-Oct-2000
DILLENIACEAE	Hibbertia glebosa ssp. oblonga			R	14-Jul-2018
DILLENIACEAE	Hibbertia obtusibracteata	Prickly Guinea-flower		V	28-Jan-2019
EUPHORBIACEAE	Beyeria subsecta	Kangaroo Island Turpentine Bush	VU	E	02-Nov-2018
GRAMINEAE	Austrostipa densiflora	Fox-tail Spear-grass		R	12-Oct-2011
LABIATAE	Prostanthera chlorantha	Green Mintbush		R	12-Mar-2021
LEGUMINOSAE	Pultenaea insularis	Beyeria Bush-pea		E	06-Jun-2005
LILIACEAE	Xanthorrhoea semiplana ssp. tateana	Tate's Grass-tree		R	07-Mar-2013
MYOPORACEAE	Myoporum parvifolium	Creeping Boobialla		R	30-Sep-2012
MYRTACEAE	Eucalyptus diversifolia ssp. hesperia	Coastal White Mallee		R	28-Apr-2011
MYRTACEAE	Eucalyptus fasciculosa	Pink Gum		R	20-May-2019
MYRTACEAE	Eucalyptus phenax ssp. compressa	Kangaroo Island Mallee		R	20-May-2019
ORCHIDACEAE	Caladenia ovata	Kangaroo Island Spider-orchid	VU	E	24-Sep-2004
ORCHIDACEAE	Caladenia reticulata	Veined Spider-orchid		R	14-Sep-2003
ORCHIDACEAE	Caladenia sanguinea	Crimson Daddy-long-legs		R	10-Sep-1999
PROTEACEAE	Grevillea halmaturina ssp. halmaturina	Prickly Grevillea		R	20-May-2019
PROTEACEAE	Grevillea muricata	Rough Spider-flower		R	28-Jan-2019
RESTIONACEAE	Desmodcladus diacolpicus	Bundled Cord-rush		V	19-Oct-1999
RHAMNACEAE	Spyridium daphnoides	Spoon-leaved Spyridium		R	28-Jan-2019
RHAMNACEAE	Spyridium glabrisepalum	Macgillivray Spyridium	VU*	E*	20-May-2019
RUTACEAE	Correa backhouseana var. orbicularis	Round-leaf Correa		R	12-Oct-2011

Appendix 2. Bushland Vegetation Assessment Scoresheet

Vegetation Condition Scores				Conservation Significance Score	
SITE:		Hog Bay Road Junction Upgrades		Is the vegetation association considered a Threatened Ecological community or Ecosystem?	
BCM COMMUNITY		KJ 4 Mallee and woodlands with a mid dense shrub and sedge understorey on limestone based soils		State (Provisional List of Threatened Ecosystems of SA) Rare community (0.1 pt)	
VEGETATION ASSOCIATION DESCRIPTION		Eucalyptus cneorifolia/Melaleuca halmaturorum Mallee Woodland over		State (Provisional List of Threatened Ecosystems of SA) Vulnerable community (0.2 pts)	
SIZE OF SITE (Ha)		1.04		State (Provisional List of Threatened Ecosystems of SA) Endangered community (0.3 pts)	
				Nationally (EPBC Act) Vulnerable community (0.35 pts)	
				Nationally (EPBC Act) Endangered or Critically Endangered community (0.4 pts)	
Benchmarked attributes (Scores determined by comparing to a Benchmark community)		Native Plant Life Forms		Note: all sites will score a minimum Conservation Significance Score of 1	
Number of Native Species (Minus herbaceous annuals for spring Surveys)		25		Threatened Community Score	
Native Plant Species Diversity Score (max 30) from benchmark score weighted by a factor of 2		20.0		1	
Number of regenerating native species		0		Number of Threatened Flora Species recorded for the site (within the site)	
Regeneration Score (max 12) from benchmark community weighted by a factor of 1.5		0		*If a species has both a State (NP&W Act) and National (EPBC Act) rating, it's only recorded for its National rating.	
				State Rare species recorded (1 pt each)	
				State Vulnerable species recorded (2.5 pt each)	
				State Endangered recorded (5 pts each)	
				Nationally Vulnerable species recorded (10 pts each)	
				Nationally Endangered or Critically endangered species recorded (20 pts each)	
				0 = 0 pts; <2 = 0.04 pts; 2 - <5 = 0.08 pts; 5 - <10 = 0.12 pts; 10 - <20 = 0.16 pts; 20 or > = 0.2 pts	
				Threatened Flora Score	
				0	
Weed species (Top 5 Cover x Invasiveness)		Cover (max 6) Weed Threat Rating (max 5) C x I		Potential habitat for Threatened Fauna Species (number observed or previously recorded)	
Asparagus asparagoides forma		1 5 5		*If a species has both a State (NP&W Act) and National (EPBC Act) rating, it's only recorded for its National rating.	
Freesia cultivar		2 3 6		State Rare species observed or locally recorded (1 pt each)	
Phalaris sp.		2 3 6		State Vulnerable species observed or locally recorded (2.5 pt each)	
Pennisetum clandestinum		2 3 6		State Endangered species observed or locally recorded (5 pt each)	
Cynodon dactylon var.		2 2 4		Nationally Vulnerable species observed or locally recorded (10 pts each)	
		Cover x Threat		Nationally Endangered or Critically endangered species observed or locally recorded (20 pts each)	
Weed Score (max 15) from benchmark community		5		0 = 0 pts; <2 = 0.02 pts; 2 - <5 = 0.04 pts; 5 - <10 = 0.06 pts; 10 - <20 = 0.08pts; 20 or > = 0.1 pts	
				Threatened Fauna Score	
				0.1	
Native Plant Life Forms (max 20) from benchmark score weighted by a factor of 2		20.0		CONSERVATION SIGNIFICANCE SCORE	
				1.1	
Non-Benchmarked Attributes (Scores determined from direct field observations)		Is the community naturally treeless?		Total Scores for the Site	
Native:exotic Understorey biomass Score (max 5)		4		Score	
				LANDSCAPE CONTEXT SCORE	
				1.17	
				VEGETATION CONDITION SCORE	
				36.98	
				CONSERVATION SIGNIFICANCE SCORE	
				1.10	
				Vegetation Condition x Landscape Context x Conservation Significance =	
				UNIT BIODIVERSITY SCORE	
				47.59	
				Total Biodiversity Score	
				(Biodiversity Score x hectares)	
				49.49	
Vegetation Condition Score calculation				Photo Point and Vegetation Survey Location	
Positive Vegetation Attributes Score = Native species diversity + Regeneration + Native Plant Life Forms				Direction of the Photo	
Fallen timber/debris + Hollow-bearing trees				North	
- If the community Score is Not Benchmarked (SNB) for regeneration this score is multiplied 1.24				GPS Reference	
- If the community is naturally treeless this score is multiplied by 1.29				Datum WGS84	
Negative Vegetation Attributes Score = (15 - Weeds) + ((10 - Biomass score - Tree Canopy Cover Score)exp2/2)				Zone (52, 53 or 54) 53	
VEGETATION CONDITION SCORE (Positive veg attributes x ((80 - Negative vegetation attributes) / 80))				Easting (6 digits) 731713	
43.50				Northing (7 digits) 6043235	
12.00				Description	
36.98				E. cneorifolia over M. halmaturorum mallee woodland	
What is the purpose of Assessment?				Clearance SEB Area Other	
Assessment for Clearance				Approximate hectares required	
Loss Factor				6.50	
Loadings for clearance of protected areas				Economies of Scale Factor	
Reductions for rehabilitation of impact site				0.5	
SEB Points required				Mean Annual rainfall for the site (mm)	
51.96				473	
				Payment into the fund (GST Exclusive)	
				\$32,873.35	
				Administration fee (GST Inclusive)	
				\$1,808.03	



Hog Bay Rd
Bushland Scoresheet