Jacobs

Native Vegetation Clearance

Riddoch Highway – Southern Overtaking Lane

Data Report

Clearance under the *Native Vegetation Regulations 2017*

14 April 2021 (minor updates 21 July 2021)

Prepared by Accredited Consultants Katie Fels, Dr Zeta Bull, Dr Sonia Croft and support from Dr Lucy Clive (not accredited) on behalf of DIT

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1. Application information

Application Details

Applicant:	Department for Infrastructure and Transport (DIT)		
Key contact:	Catherine Gray (DIT, Enviro Officer)		
Landowner:	Road easement owned by the Commonwealth Government and managed by DIT, but may impact the frontage of several private properties adjacent the footprint to accommodate earth works		
Site Address:	The Southern Overtaking Lane (SOTL) is a south bound overtaking lane located on the Edenhope Road to Coonawarra approximately 31 km south-east of Naracoorte and 4 km north of Coonawarra (Figure 1). The SOTL starts immediately south of the Riddoch Highway, Comaum School intersection and finishes 640 m north of the Riddoch Highway, Clayfield Road intersection (from MMP 142 to MMP 144).		
Local Government Area:	Wattle Range Council Area	Hundred:	Comaum
Title ID:	CT NA for road CT6019 / 144 CT6017 / 484 CT5649 / 307 CT5649 / 310 CT5354 / 892 CT6248 / 87 CT5899 / 473 CT6149 / 657	Parcel ID	

Summary of proposed clearance

Purpose of clearance	Clearance is required to permit the installation of the Riddoch Highway Southern Overtaking Lane (SOTL, approximately 1.5 km long) and associated road furniture, drainage and safety features as required by the relevant standards.
Native Vegetation Regulation	The project falls under Part 6 – Other Activities, Regulation 12, Clause 32 (Works on Behalf of Commissioner of Highways) of the Native Vegetation Regulations 1997. This clause relates to *"clearance of vegetation incidental to work being undertaken by or on behalf of the Commissioner of Highways (other than repair or maintenance work of a kind referred to in Part 1, Clause 2)"*.
Description of the vegetation under application	This project will require the removal and pruning of mostly scattered paddock trees, some amenity plantings and a very small area of degraded native vegetation: Vegetation under application • **Scattered Paddock Trees** – **40 trees in total removed**, including 1 Blackwood (*Acacia melanoxylon*), 29 live individual River Red Gum (*Eucalyptus camaldulensis*), 6 River Red Gum in a clump, 1 dead River Red Gum, and 3 potential related to SRZ assessment 2 River Red Gum from a clump of 22, 1 River Red Gum from a clump of 19. • **Scattered Paddock Trees – up to 8 Major Prune** (Blackwood Wattle in a clump); **41 trees in total Minor prune**, 3 individual River Red Gum, 38 River Red Gum in two clumps (clump E and G). Note clump E – 19 RRG of which 15 are adults, 4 are juveniles. • **Native Vegetation Association 1 (NV 1)** – **0.007 ha** of Cocksfoot (*Dactylis glomerata*), Phalaris (*Phalaris aquatica*) exotic grassland over a

	sparse grassy / herbaceous native groundcover of Sheep's Burr (*Acaena echinata*), Rough Raspwort (*Haloragis aspera*), Native Bluebell (*Wahlenbergia* sp.), Spear-grass (*Austrostipa* sp.), Matt-rush (*Lomandra* sp.) and Emu Grass (*Distichlis distichophylla*).
	Amenity vegetation under application (refer DIT data report and data sheet, DIT internal approval required) • Amenity Trees (not subject to NV Act) – remove 5 amenity trees in total, including 1 Blue Gum (*Eucalyptus leucoxylon)*, 3 (*Eucalyptus* sp., 1 is sapling), 1 *Casuarina* sp. and minor prune 1 Sugar Gum (*Eucalyptus cladocalyx*); • Amenity Patches (not subject to NV Act): 0.18 ha in total: o 0.16 ha of Amenity Patch 2 (AP2) comprised of 2 River Red Gum, approx. 22 Blue Gums (*Eucalyptus leucoxylon*), 5 *Melaleuca* sp., 1 Drooping Sheoak (*Allocasuarina verticillata*), 1 *Casuarina* sp. o 0.01 ha of Amenity Patch 3 (AP3), planted River Red Gum (x 2), dead trees (x 4) over exotic grasses. o 0.01 ha of Amenity Patch 4 (AP4),planted *Eucalyptus sp., Allocasuarina verticillata* over exotic grasses.
Total proposed clearance - area (ha) and number of trees	Total proposed clearance subject to the NV Regulations: • 40 scattered paddock trees – remove (28 individual live RRG, 1 dead RRG, 6 RRG (clump D), 1 Blackwood Wattle, 2 RRG from clump G, 1 RRG from clump E) • 8 trees major prune Blackwood Wattle (Clump C); • 41 trees minor prune (38 RRG (clump E and G), 3 individual RRG) • 0.007 ha of NV 1 TBS of Scattered Trees and Clumps is 119.74
Level of clearance	Level 4 (Level 3, > 20 trees with TBS is 119.74, with escalating factors, however moderating factors suggest Level 3)
Overlay (Planning and Design Code)	This project is not subject to a development application (refer Section 2.5 below).
Map of proposed clearance area (show as a minimum; property boundary and proposed clearance area)	

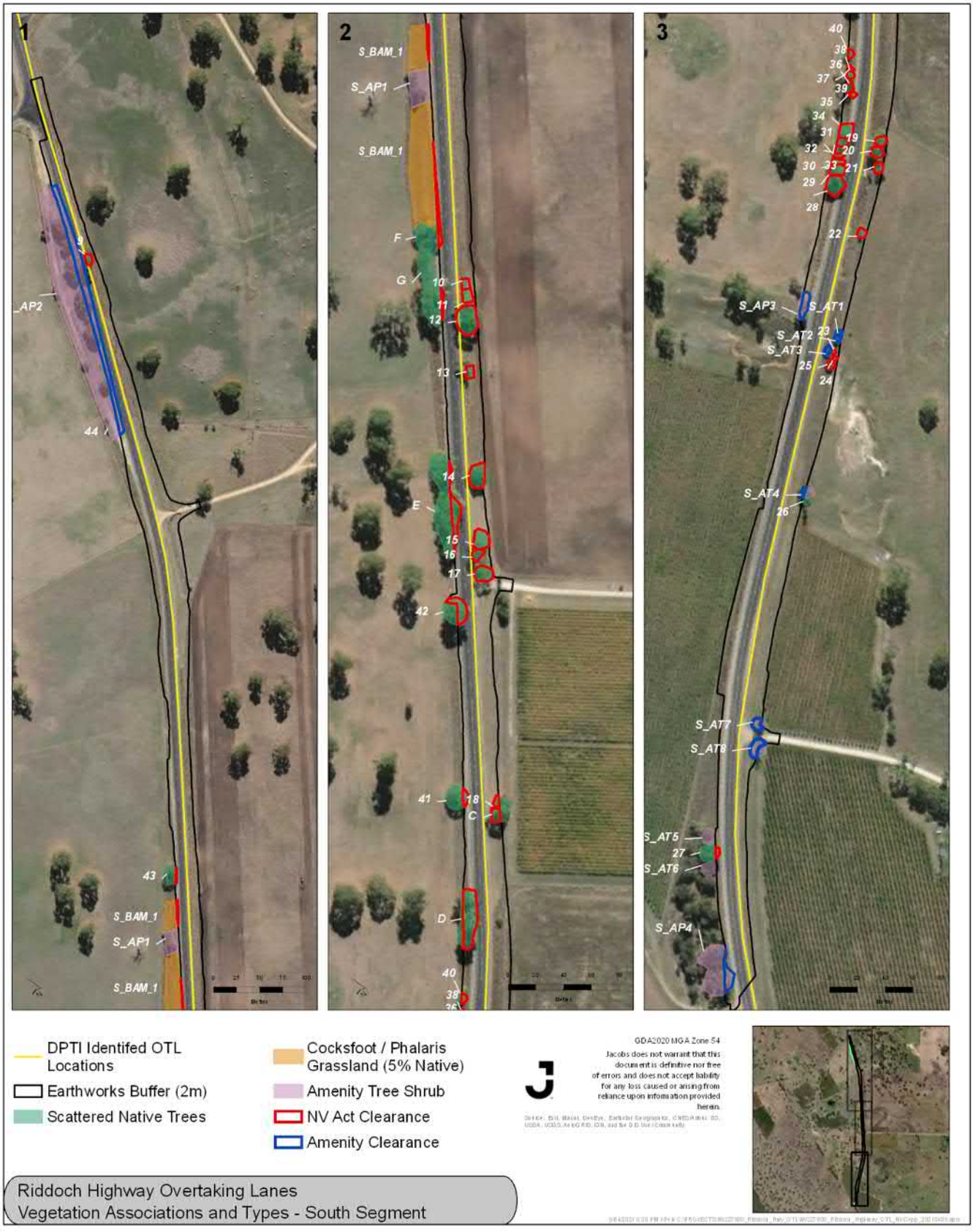

***Figure 1*: Proposed clearance based on October Earthworks Design (2m buffer boundary) for the SOTL**

Mitigation hierarchy	The project has considered avoidance and minimisation of impact to the environment at all stages of the project thus far, from pre-feasibility through to

	concept and detailed design, in conjunction with design safety requirements and minimised construction envelopes. An initial feasibility study was completed by DIT (then DPTI) in 2012. This study provided a cost v benefit analysis, considering avoidance (do nothing case) and minimisation (do something case(s)) of impact to a range of factors including ecological (and other) environments. From this, DIT determined that the project was of sufficient value to proceed and identified three preferred options that represented a compromise between the factors considered and specifically minimise impact to scattered native trees. The overtaking lane design has been developed to retain the existing horizontal road alignment as much as possible, thereby minimising the disturbance footprint and associated impacted to native vegetation. Minor adjustments have been made only, and include curve widening for all curves and increasing nearside shoulder widths to 2.0m, enabling the road to cater for the new PBS level 3 design vehicles and to accommodate a 1.4m wide centre line treatment. Both upgrades are in line with current road design standards implemented to enhance road safety and reduce the likelihood of head-on collisions. To further minimise impact to native vegetation within or near the road corridor, 1(vertical) to 3(horizontal) batter slopes with safety barrier protection have been implemented wherever possible (i.e. where sight visibility requirements are not impacted). Where not possible, batter slopes have been designed as 1(vertical) to 6 (horizontal) slopes to provide an acceptable balance between motorist safety, cost of construction and potential impact to native flora and fauna. This application is based on the final design provided in April 2021. Please note: The likely impact on existing vegetation (including the Structural Root Zone (SRZ)) has been determined based on the Issued for Approval (IFA) design and an estimated 1.5m construction area (i.e. construction activities including plant and vehicle movement are expected to be contained to within 1.5m of the edge of design). However, it is noted that the calculated impact is an estimate only. The real impact is dependent on the final Issued for Construction (IFC) design, the selected Construction Contractor and their proposed construction methodology. It is recommended that the vegetation impacts described in this document are reviewed and confirmed by the Construction Contractor and / or a qualified arborist and following the mitigation hierarchy where safety allows.
SEB Offset proposal	To offset clearance of 40 **scattered paddock trees** (37 live River Red Gum, 1 dead River Red Gum, 1 Blackwood Wattle) and major pruning 8 Blackwood Wattle and minor pruning of 41 River Red Gum,): • TBS of 119.74 • 56.16 SEB points required • $45,170.19 (as per scattered tree scoresheet)

	To offset 0.0071 ha of NV 1: • TBS of 0.05 • 0.05 SEB Points required • $40.65 Total of $45,210.84 ***Offset via payment into the NVC fund***.

2. Purpose of clearance

2.1 Description

The Riddoch Highway (the Highway) is a 240-kilometre state-maintained highway between Keith and Port MacDonnell, near the South Australia's south eastern border with Victoria. The highway is vital for tourism, and primary production industries in the region, linking the high timber producing Limestone coast to the major road network in South Australia.

Clearance is required to permit the installation of a south bound overtaking lane (approximately 1.5 km long) with associated road furniture, drainage and safety features as required by relevant standards. The final total disturbance footprint is 6.32 ha, within this area there are scattered trees, amenity trees, amenity patches and very small area of degraded native grassland that require clearance.

The project will provide a safer method of travel, avoiding the need to enter the oncoming traffic lane when overtaking slower vehicles. The project will also improve stormwater drainage infrastructure within the road reserve, reducing the risk of the road being inundated during events of high rainfall.

2.2 Background

The land-uses within the project area (including a 1 km buffer) include:

- Agriculture (west of southern extent)
- Rural residential (east)
- Horticulture (east of central extent)
- Forestry (250 m east of central extent)
- Utilities (650 m west of northern extent).
- Commonwealth Road Reserve (within which the development is mostly located).

From review of the available aerial photography (earliest 1966, latest 2020). the Study Area and surrounding areas appear predominantly unchanged, with scattered horticultural (vineyards and cropping) land uses over historic cleared land within the 150 m buffer.

The SOTL is one of three overtaking lanes being considered for the Riddoch Highway to significantly improve road safety for this major transport route. Potential project areas were initially identified by DIT, and have undergone refinement through consideration of engineering, safety and environmental constraints.

The three overtaking lanes are located:

- 20 km north of Naracoorte, accommodating south-bound traffic (Northern Overtaking Lane or NOTL)
- 18 km south of Naracoorte, accommodating north-bound traffic (Central Overtaking Lane or COTL,)
- 5 km north of Coonawarra, accommodating south-bound traffic SOTL, this report).

This report is the native vegetation clearance approval for the SOTL.

2.3 General location map

The SOTL is a south bound overtaking lane located on the Edenhope Road to Coonawarra approximately 31 km south-east of Naracoorte and 4 km north of Coonawarra. The SOTL starts immediately south of the Riddoch Highway, Comaum School intersection and finishes 640 m north of the Riddoch Highway, Clayfield Road intersection (from MMP 142 to MMP 144).

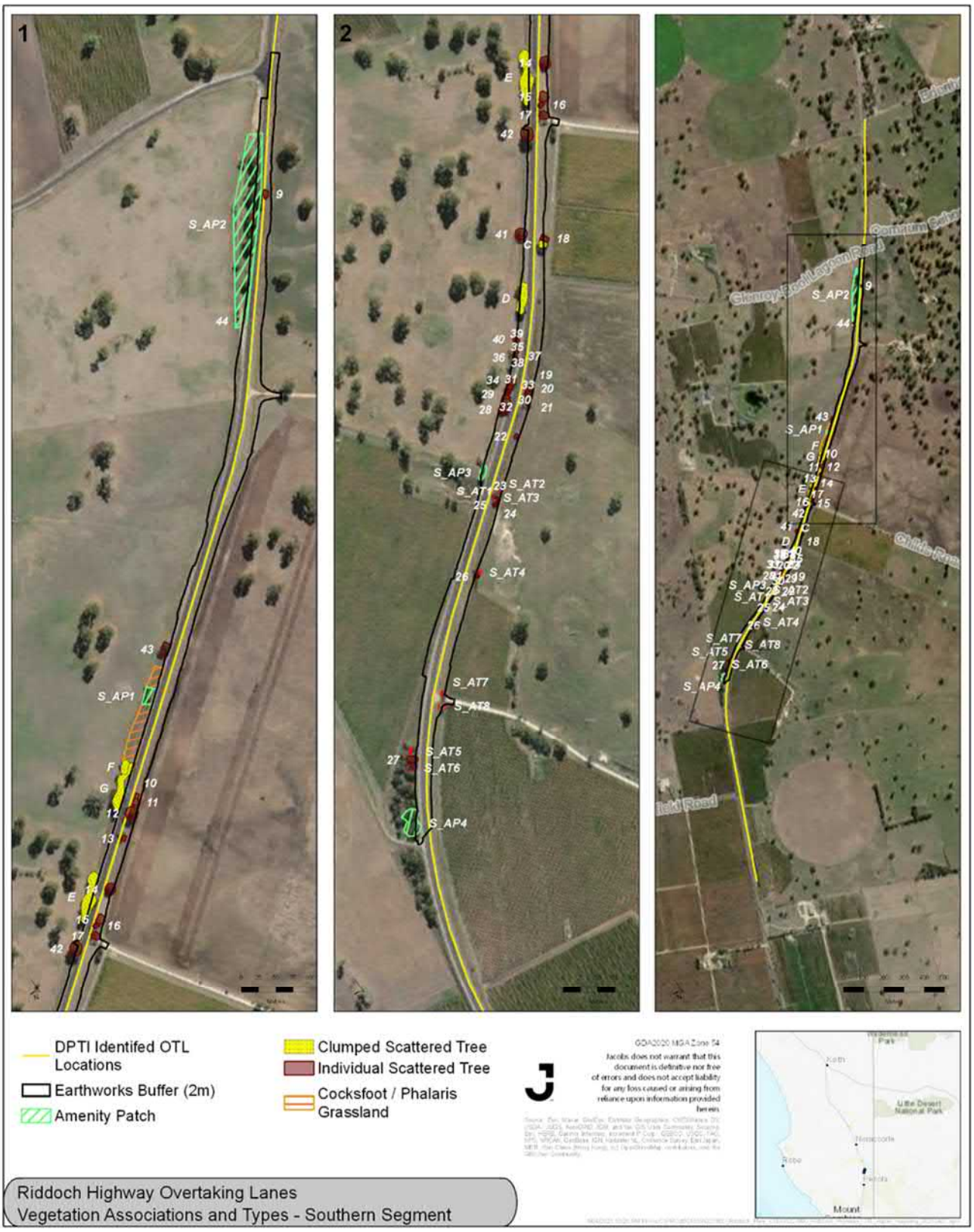

Figure 2: Riddoch Highway Southern Overtaking Lane Project Area

2.4 Details of the proposal

Refer to Riddoch Highway EHIAR report and IFC 100% design reports for the SOTL. Refer to DIT Vegetation Survey Data sheet for information related to Structural Root Zone and proposed site specific construction impacts (e.g. SRZ impacts related to fencing, trenching, pavement or line of site).

2.5 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 legislation and why it is / is not applicable each case.

Native Vegetation Act 1991 and *Regulations 1997*

Removal of native vegetation is necessary. Clearance approval and offsetting will be required for the removal of any native vegetation (the subject of this data report). Risk Level 4, as per DIT Vegetation Removal policy (2020) (i.e. approval via General Manager, Infrastructure Delivery (GMID) & Native Vegetation Assessment Panel (NVAP)), due to escalating factors (Seriously at Variance with Principle 1b), however moderating factors could reduce the clearance to Level 3 (i.e. Internal DIT approval and approval via DEW NVMU),. This is based on the number of trees (> 20) and Total Biodiversity Score being at least 119, but well less than the 250 for level 4, however it is noted that there may be escalating factors associated with remnancy of the area and that DEW would make the final decision.

All native vegetation clearance will be offset by DIT through payment into the NV fund.

Amenity Vegetation clearance (DIT internal) approval and offsetting will also be required for the removal of Amenity Vegetation. DIT will offset all amenity vegetation losses 1:1.

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

The proposed works do not require Development Approval, as works for the construction or alteration of a road by the Crown (DIT) is exempt pursuant to section 3 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).

Water Resources Act 1997

No additional water will need to be sourced or licensed for the construction of the overtaking lane.

Environment Protection and Biodiversity Conservation (EPBC) Act 1999

The project has been assessed as not having a significant impact upon any related Matter of National Environmental Significance, and therefore EPBC referral is not required and has not been undertaken.

National Parks and Wildlife (NPW) Act 1972

The project is not impacting directly on and state reserves. Flora (material or seed) will not be collected as part of this project. The project has been assessed as not having a significant impact upon any endangered, rare or vulnerable species as listed by the schedules of this Act. A desktop likelihood assessment has been undertaken and well as a

more detailed significant impact assessment for relevant species (Appendix 1.2 in the EHIAR package). Refer section 3 and 4.

Landscapes South Australia Act 2019

The project seeks to remove, replace and install culverts to divert overland waters. As such, advice was sought from the Limestone Coast Landscape Board and the South East Water Conservation and Drainage Board regarding the need for a Water Affecting Activity Permit and/or Private Water Management Works Licence, respectively.

Representatives from both Boards have confirmed the nature of works do not trigger the need for a Water Affecting Activity Permit and/or Private Water Management Works Licence.

A permit will be sought (if required) from the relevant Limestone Coast Lanscapes SA Board to remove, transport and seek appropriate disposal of any Declared or WoNS removed during the land clearance required for this project.

Aboriginal Heritage Act 1988

A desktop assessment of Aboriginal (and non-Aboriginal) heritage was undertaken but did not note result in any locations or items of note requiring protection or relocation (see DIT EHIAR). In relation to Native Title, on 10 November 2017, the Native Title claim of the First Nations of the South East #1 was accepted for registration by the National Native Title Tribunal and entered on the Register of Native Title Claims (NNTT No. SC2017/002). At the time of writing, a decision regarding the application of Native Title to land within the project area remains undetermined (i.e. no land has been determined yet to be subject to Native Title). A decision regarding the application of Native Title to land is anticipated in 2021.

Environment Protection Act 1993

With a shallow water table present across much of this region, construction activities may require an Earthworks Drainage License from the EPA to dispose of excess water.

2.6 Native Vegetation Regulation

The project falls under Part 6 – Other Activities, Regulation 12, Clause 32 (Works on Behalf of Commissioner of Highways) of the Native Vegetation Regulations 1997. This clause relates to *"clearance of vegetation incidental to work being undertaken by or on behalf of the Commissioner of Highways (other than repair or maintenance work of a kind referred to in Part 1, Clause 2)"*.

Vegetation clearance and offsetting will be processed in accordance with DIT's vegetation Removal Policy (Standard Operation Procedure endorsed by the Native Vegetation Council (NVC)). As the vegetation removal has been assessed as a Level 4 clearance, the project will require:

- Level 3 –endorsement required by DIT Principal Environmental Advisor (PEA), and approval by a NVC delegate (i.e. by the Native Vegetation Branch) – based on Total Biodiversity Score, and number of trees to be impacted

  However, it is noted that there are escalating factors and DEW delegates may suggest the clearance requires level 4 clearance. However, moderating factors suggest the clearance could remain at level 3, DEW delegate to decide (refer Section 4).

- Level 4 – endorsement required by DIT General Manager, Infrastructure Delivery (GMID) and approved by the Native Vegetation Assessment Panel (NVAP)

2.7 Development Application information (if applicable)

Not applicable (see Section 2.5 above).

3. Method

3.1 Flora assessment

The flora data contained within the report has been compiled from desktop and in-field assessment.

DESKTOP
Searches of publicly available information about the Study Area (i.e. 5km sections of road, with 5 km buffers) included:

- The *Environment Protection and Biodiversity Conservation Act* (EPBC Act) *1999* Protected Matters database via the online Protected Matters Search Tool (PMST) with a 5 km buffer (see Appendix 1).
- Department for Environment and Water (DEW) Biological Databases of South Australia (BDBSA) data output with a 5 km buffer.
- DEW NatureMaps (2020)
- General ecology flora reference materials, including Bushland Condition Monitoring (BCM) classifications for South East native vegetation communities (Milne and Croft 2012).
- Consideration of the DIT Vegetation Removal Policy (DIT 2020)
- Consideration of the Native Vegetation Regulations 2017 under the *Native Vegetation Act 1991*, Bushland Assessment Manual (NVC 2020a), Significant Environmental Benefit Offset Policy and Guidelines (NVC 2020b) and NVC Scattered Tree Guidelines (NVC 2020c).

The EPBC Act online Protected Matters Search Tool (PMST) was used to identify any flora or ecological communities of national environmental significance potentially occurring within the wider Study Area and the Project Areas.

The BDBSA extract was obtained from DEW (February 2020) to identify flora species previously recorded within a 5 km buffer around the road alignment (the Study Area). The 5 km buffer provides a higher probability of records in an area with a general paucity of data. The BDBSA is comprised of an integrated collection of corporate databases which meet DEW standards for quality data, integrity and maintenance (Department for Environment and Water 2019). This data is included under agreement with the partner organisation for ease of distribution..

INFIELD ASSESSMENT
Field assessment was undertaken on 30th and 31st March 2020 by Jacobs Ecologists (Dr Sonia Croft, Native Vegetation Accredited Consultant, and Dr Lucy Clive, graduate Ecologist). Ecological information was collected according to the DIT Vegetation Removal Policy (2020), Native Vegetation Council Bushland Assessment Methodology (NVC 2020a) and the Native Vegetation Council Scattered Tree Assessment Manual (NVC 2020c), where applicable. It is noted that only publicly accessible areas were accessed during this survey.

The assessment identified potential flora (and fauna, refer Section 3.2 below) constraints associated with the project.. Both sides of the approximate 1.5 km road corridor were surveyed, up to 10 m from the edge of the road, or until the perimeter fence of the adjacent property.

The following definitions were applied to the field assessment:

- **Amenity Tree:** A tree which, by virtue of its size and aesthetic qualities, provides amenity. Amenity trees do not include native vegetation as defined by the *Native Vegetation Act 1991* or declared plants or environmental weeds (with the exception of environmental weeds that are planted and have amenity value). Amenity trees are usually planted trees, but may include self-sown plants if they have high amenity value (DIT 2020). Each amenity tree was given an individual code (e.g. AT 1).
- **Amenity Patch:** A patch that has amenity / planted vegetation dominant in the understorey. An amenity patch may also include amenity trees with or without understorey. General details about the species, size and

number of amenity trees are collected, but each tree is not given an individual tree number. Each amenity patch was given an individual code (e.g. AP 1).

- **Amenity Shrub**: Shrubs are not clearly defined in the DIT policy but is mainly related to larger shrub species that are tree-like, e.g. tall Acacias or spreading Melaleucas. For the purpose of offset, these types of shrubs would be treated like an amenity tree. Smaller shrubs / bushes would be classed as a patch or within a patch.
- **Environmental Weeds:** Native or exotic species that invade and degrade native vegetation (DIT 2020). For the purpose of this report, environmental weeds are those listed in the DPTI Weeds List, available from link at https://www.dpti.sa.gov.au/standards/environment
- **Major prune:** Removal of limbs or severing roots greater than 10% of the biomass of the tree (DPTI 2020)
- **Native Vegetation:** A plant or plants of a species indigenous to South Australia including:
    - A plant or plants growing in or under waters of the sea.
    - Dead trees, with trunk circumference > 200 cm (> 100 cm on Kangaroo Island), measured at 300 mm above natural ground level, which provide habitat for threatened species listed under the EPBC Act.
    - Also includes vegetation that was sown or planted to comply with a condition of clearance approval under the Native Vegetation Act.
- **Tree / Scattered Tree:** For the purpose of the DIT Policy, the department defines a 'tree' as a plant with a butt diameter of 0.15 m or greater measured at 1 m above the natural ground level, or for multi-stemmed trees, with one or more stems with a butt diameter 0.1 m or greater measured at 1 m above natural ground level (see Table 3.1 of the policy for where this definition is applied).
  For Native Vegetation assessments, 'scattered trees' are defined by the Scattered Tree Assessment Manual (NVC 2019b) guidelines as naturally occurring indigenous trees, usually two or more meters in height that occur over little or no native understorey (DPTI 2020). However, height can vary depending on the species and habit. In some instances, trees < 2 m may be considered scattered trees, and some >2 m in height may still be classed as saplings (DPTI 2020).
- **Overlapping areas:** As per discussion with DPTI, where there is overlap of native vegetation understorey and/or overstorey and amenity trees, both vegetation types are delineated. Similarly, where scattered trees occur within highly degraded native vegetation patches, both areas will be delineated to assist with offsetting.
- **Regulated / Significant trees:** A tree is considered a Regulated tree if it is declared to be a significant tree, or a tree within a stand of trees declared to be significant trees, by a Development Plan (whether or not the tree is also declared to be a regulated tree, or also falls within a class of trees declared to be regulated trees, by the regulations). That declaration overrides the definition (and exclusions) in the Development Regulations.

This project falls outside 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), in accordance with Regulation 6A(3) of the Development Regulations, 2008

3.2 Fauna assessment

The fauna data contained within the report has been compiled from desktop and in-field assessment.

DESKTOP
Searches of publicly available information about the Study Area (i.e. 5km sections of road, with 5 km buffers) included:

- The EPBC Act Protected Matters database via the online Protected Matters Search Tool (PMST) with a 5 km buffer (see Appendix 1).
- Department for Environment and Water (DEW) Biological Databases of South Australia (BDBSA) data output with a 5 km buffer.
- DEW NatureMaps (2020)
- General ecology fauna reference materials

The EPBC Act online Protected Matters Search Tool (PMST) was used to identify fauna of national environmental significance, including listed threatened and migratory species potentially occurring within the wider study area and ultimately the project areas.

The BDBSA extract was obtained from DEW (February 2020) to identify fauna species previously recorded within a 5 km buffer around the road alignment (the study area). The 5 km buffer provides a higher probability of records in an area with a general paucity of data and allows for records of mobile fauna (mostly birds) that have been recorded more broadly in the region. The BDBSA is comprised of an integrated collection of corporate databases which meet DEW standards for quality data, integrity and maintenance (Department for Environment and Water 2019). In addition to DEW biological data, the BDBSA also includes data from partner organisations (Birds Australia, Birds SA, Australasian Wader Study Group, SA Museum, and other State Government Agencies). This data is included under agreement with the partner organisation for ease of distribution, but they remain owners of the data and should be contacted directly for further information.

The desktop assessment included a likelihood of occurrence assessment and following field survey a significant impact assessment for EPBC listed species considered possible or likely to occur (Refer to Section 1.2 of the EHIAR).

INFIELD ASSESSMENT

The ecological assessment undertaken on 30th and 31st March 2020 included:

- An opportunistic fauna assessment undertaken concurrently with the vegetation survey, which included recording signs of fauna (scats, tracks, nests, holes and other traces) and any animals observed utilising the habitat (predominantly birds). No trapping or invasive methods were employed (fauna permitting not required), noting that these methods would be unlikely to yield reliable results due to the location immediately adjacent a busy road corridor.
- An infield assessment was made as to the value of habitat for potential threatened fauna listed under the EPBC Act and NPW Act and identified as potentially present by the desktop assessment (e.g. Striped Legless Lizard, Red and Yellow-tailed Black Cockatoos).

4. Assessment Outcomes

4.1 Vegetation Assessment

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

The Interim Biogeographical Regionalisation of Australia (IBRA) identifies geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information (Thackway and Cresswell 1995). The bioregions are further refined into subregions and then environmental associations. The SOTL lies within the:

- Naracoorte Coastal Plain (NCP) bioregion
- Lucindale IBRA Subregion, or which there is an estimated 13 % remnant of native vegetation
- Glenroy IBRA Association, estimated to retain 0% native vegetation, other than scattered trees.

Table 1 summarises key characteristics that describe the Lucindale IBRA Subregion (Nature Maps 2020).

Table 1: Vegetation, Landform, Geology and Soils of the Lucindale IBRA Subregion (NCP03)

Vegetation	The vegetation of this subregion is dominated by eucalypt woodlands with a shrubby understorey. Approximately 13% (93,770 ha) of the subregion is mapped as remnant vegetation, of which 30% (28,477 ha) is protected.
Landform	Swampy coastal plain with clayey lagoon deposits. Swampy plain overlain in large areas by gentle dunes and sheets of white arid sand. Adjacent to coast indurated dunes of calcareous sand and dunes of orange sand. The SOTL is not intersected by any major watercourses or drainage lines, but is subject by general cross landform drainage.
Geology	Sequence of stranded beach ridges (Tertiary); silicified & ferruginised sands (Karoonda Surface); Ripon calcrete
Soil	Nomopodsols, sandy leptopodsols, solodic soils, swamp soils, rendzinas & terra rossas

The native vegetation in the region of the SOTL project is in keeping with that described by the Glenroy IBRA Association; scattered remnant paddock trees mostly River Reg gum (*Eucalyptus camaldulensis*) with some smaller Blackwood (*Acacia melanoxylon*) and Golden Wattle (*Acacia pycnantha*), together with sparse roadside, rural and residential amenity tree plantings (various locally indigenous, non-indigenous and exotic species), over very sparse (if any) remnant native understorey scattered amongst a mixture of common exotic pasture grasses. The native vegetation remaining is highly fragmented and of varying quality, surrounded by agricultural landscape of cropping and pasture. The footprint itself is not mapped as native vegetation in Nature Maps (NatureMaps, 2020).

The site is located in the Limestone Coast Region and falls within the area covered by the *Native Vegetation Act 1991*. Protected conservation assets within the broader region include:

- Hacks Lagoon Conservation Park is over 17 km northwest from the northern end of the Southern OTL footprint.
- Bool Lagoon Game Reserve is approximately 16 km northwest of the northern end of the Southern OTL footprint.
- Naracoorte Caves and the Naracoorte Caves National Park are over 17 km north of the northern end of the Southern OTL footprint.
- Glen Roy Conservation Park is just over 3 km north northwest of the northern end of the Southern OTL footprint.

The footprint avoids regional native vegetation patches (Heritage Agreement areas 1136, and 1347) and pine plantations to the north east of the SOTL. These vegetation heritage agreement areas, as well as Glen Roy Conservation Park are all mapped as greater than 50 ha vegetation patches and are considered important for habitats for local fauna.

Heritage Agreement Areas 1136 and 1347 are mapped as native vegetation, along with two smaller patches east of the footprint. These areas, along with the exotic pine forests to the north east and east of the OTL footprint would provide suitable habitat for the SE Red-tailed Black Cockatoo (EPBC and NP listed as endangered) and the Yellow-tailed Black Cockatoo (NPW listed as rare) (see Section 4.2 of the EHIAR).

Details of the vegetation associates/scattered trees proposed to be impacted

The survey identified one patch of remnant native vegetation, and scattered native remnant as described by the tables following and **Figure 2** above. In addition to remnant native vegetation, the survey identified amenity planting trees (clumps and individuals, described below) and the remaining roadside areas include exotic grassy vegetation association; Phalaris (*Phalaris aquatica*) or Cocksfoot (*Dactylis glomerata*) over dense exotic herbs and grasses including Pincushion (*Scabiosa atropurpurea*), Wild Sage (*Salvia verbenaca*), Sweet-scented Evening Primrose (*Oenethera stricta*), Bermuda Grass (*Cynodon dactylon*) and Kikuyu (*Cenchrus clandestinus*).

Table 2: Native Vegetation Association (NV) 1

Vegetation Association (NV 1)	Cocksfoot *(Dactylis glomerata),* Phalaris *(Phalaris aquatica)* exotic grassland over a sparse grassy / herbaceous native groundcover of Sheep's Burr *(Acaena echinata),* Rough Raspwort *(Haloragis aspera),* Native Bluebell *(Wahlenbergia sp.),* Spear-grass *(Austrostipa sp.),* Matt-rush *(Lomandra sp.)* and Emu Grass *(Distichlis distichophylla)*
 **Plate 1: Cocksfoot (*Dactylis glomerata*), Phalaris (*Phalaris aquatica*) exotic grassland over a sparse grassy / herbaceous native groundcover**	
General description	Two areas of cracking clay soils, totalling 0.196 ha, comprised largely exotic grasses and herbs, but also supported native groundcovers, estimated to cover at least 5 % of the area (Plate 1). Six species of naturally occurring native herbs and grasses were recorded, with *Acaena echinata* the most abundant and comprising the greatest cover. All other natives were sparsely present. This association is bounded to the west by grazing paddocks with scattered remnant *Eucalyptus camaldulensis* ssp. *camaldulensis* and likely would have formerly been a Red Gum woodland with a sedge/grass/herb-dominated understorey now existing in a very degraded state.

	In addition to the dominant exotic grasses, *Phalaris aquatica* and *Dactylis glomerata* and *Scabiosa atropurpurea*, three environmental weeds (DPTI 2017), were common and widespread. The majority of the patch (83%) has been avoided by the project, with only 0.032 ha of NV 1 located within the disturbance footprint				
Threatened species or community	No threatened flora or fauna or communities (as under the NPW Act or EPBC Act) were observed in NV 1. Previous records for the following threatened species have been recorded within km, <1 km reliability (BDBSA) (updated 5 km buffer on final footprint of SOTL): • Common Wombat • Beautiful Firetail • Black-chinned Honeyeater • Blue-winged Parrot • Chestnut-rumped Heathwren • Common Brush-tail Possum • Eastern False Pistrelle • Eastern Shriketit • Flame Robin • Hooded Robin • Jacky Winter • Olive-backed Oriole • Painted Buttonquail • Peregrine Falcon • Red-tailed Black Cockatoo • Restless Flycatcher • Scarlet Robin • Southern Bell Frog • Southern Emu-wren • Sugar Glider • White-bellied Cuckooshrike • White-throated Needle tail • White-winged Chough • Yellow-tailed Black Cockatoo While not supported by previous records, the Striped Legless Lizard (*Delma impar*, Vulnerable EPBC Act, Endangered NPW Act) may occur and has been recorded to occur in similar exotic grassland habitats in the region. The degraded patch of vegetation provides limited habitat for the majority of the species with records within 5 km, noting that many prefer dense heathland, swamp areas or watercourses. The degraded grassland habitat adjacent a major highway is not core habitat for the bulk of these species.				
Landscape context score	1.14	Vegetation Condition Score	5.48	Conservation significance score	1.10
Unit biodiversity Score	6.88	Patch Area (ha) Impact Area (ha)	0.196 0.007	Total biodiversity Score	0.05

Table 3 and Appendix A describes 37 scattered individual or patches of native remnant trees likely to be impacted by the project. Most of the trees are small to moderate in size, and in moderate to good condition, with only three individuals in poor condition (greater than 60% dieback) and one dead (100 % dieback). The scattered native paddock trees are recognised as providing stepping-stone habitat to more mobile native fauna in the region, in a landscape where the native understorey habitat has been completely cleared. While the scattered trees may provide habitat for threatened birds and bats, it is likely to be temporary roosting habitat only given the landscape context, lack of diversity, and lack of hollows (refer Table 3, dead medium sized tree with one medium sized hollow).

Wherever possible, trees will be trimmed rather than removed where the tree has been assessed as likely to survive the extent of trimming proposed, and provided the tree does not pose a safety risk that cannot be mitigated via design treatments. The full extent of trim vs removal will be finalised, following approval of the final design and then on-site prior to commencement of construction. For the purposes of this assessment, scattered trees have all been assessed as requiring complete removal, with only one clump (Clump G) noted as requiring partial removal. However, discussion with transport engineers suggest that Clump F, G and E, as well as tree 42 and 34 would be avoided.

Table 3: Native Vegetation Association (NV) 1

Tree (T) or Clump (C) #	Tree spp.	No. of trees	Height (m)	Hollows	Diam. (cm)	Canopy dieback (%)	Biodiv. Score	General comments	Photo #
T-9	*Eucalyptus camaldulensis* var. *camaldulensis*	1	16.0	0	95	10	4.13	To be REMOVED. U/S dense *Phalaris* and *Dactylis*., scattered *Acaena echinate / novae-zelandiae.*	10-1
T-10	*Eucalyptus camaldulensis* var. *camaldulensis*	1	9.0	1 (Med)	100	100	1.0	To be REMOVED. U/S dense *Phalaris* and *Dactylis*. DEAD	10-2
T-11	*Eucalyptus camaldulensis* var. *camaldulensis*	1	12.0	0	79	25	2.34	To be REMOVED. U/S dense *Dactylis*.	10-3
T-12	*Eucalyptus camaldulensis* var. *camaldulensis*	1	14.0	0	99	25	3.51	To be REMOVED. U/S *Phalaris* and *Dactylis*.	10-4
T-13	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.0	0	70	50	1.27	To be REMOVED. U/S dense *Phalaris*	10-5
T-14	*Eucalyptus camaldulensis* var. *camaldulensis*	1	9.0	0	66	10	2.01	To be REMOVED. U/S mown	10-6
T-15	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.0	0	67	10	2.22	To be REMOVED. U/S mown *Cynodon dactylon, Dactylis glomerata, Phalaris aquatica, Plantago lanceolata, Scabiosa, Trifolium campestre, Trifolium angustifolium*	10-7
T-16	*Eucalyptus camaldulensis* var. *camaldulensis*	1	5.0	0	35	20	0.5	To be REMOVED. U/S mown *Cynodon dactylon, Dactylis glomerata, Phalaris aquatica, Plantago lanceolata, Scabiosa, Trifolium campestre, Trifolium angustifolium*	10-8
T-17	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.0	0	78	25	2.22	To be REMOVED. U/S mown *Cynodon dactylon, Dactylis glomerata, Phalaris aquatica, Plantago lanceolata, Scabiosa, Trifolium campestre, Trifolium angustifolium*	10-9

Tree (T) or Clump (C) #	Tree spp.	No. of trees	Height (m)	Hollows	Diam. (cm)	Canopy dieback (%)	Biodiv. Score	General comments	Photo #
T-18	*Eucalyptus camaldulensis* var. *camaldulensis*	1	12.0	0	83	45	2.07	To be REMOVED. U/S mown *Scabiosa*, *Dactylis* and *Phalaris*	10-10
T-19	*Eucalyptus camaldulensis* var. *camaldulensis*	1	10.0	0	56	25	1.27	To be REMOVED. U/S *Phalaris* and *Dactylis*.	10-12
T-20	*Eucalyptus camaldulensis* var. *camaldulensis*	1	9.0	0	32	15	0.61	To be REMOVED. U/S *Phalaris* and *Dactylis*.	10-13
T-21	*Eucalyptus camaldulensis* var. *camaldulensis*	1	4.0	0	11	10	0.27	To be REMOVED. U/S dense *Phalaris* and *Dactylis*.	10-14
T-22	*Eucalyptus camaldulensis* var. *camaldulensis*	1	6.0	0	32	50	0.36	To be REMOVED. U/S dense *Phalaris* and *Dactylis*.	10-15
T-23	*Eucalyptus camaldulensis* var. *camaldulensis*	1	6.0	0	10	0	0.33	To be REMOVED. U/S *Phalaris* and *Dactylis*.	10-16
T-24	*Eucalyptus camaldulensis* var. *camaldulensis*	1	6.0	0	10	0	0.33	To be REMOVED. U/S *Phalaris* and *Dactylis*.	10-17
T-25	*Acacia melanoxylon*	1	5.0	0	20	0	0.49	To be REMOVED. U/S *Phalaris* and *Dactylis*.	10-18
T-26	*Eucalyptus camaldulensis* var. *camaldulensis*	1	3	0	8	0	0.22	Avoided	10-19
T-27	*Eucalyptus camaldulensis var. camaldulensis*	1	12	0	73	10	2.46	Avoided	10-20
T-28	*Eucalyptus camaldulensis* var. *camaldulensis*	1	9.0	0	61	15	1.38	To be REMOVED. U/S dense *Phalaris* +/- *Scabiosa*	10-21
T-29	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.0	0	42	10	1.3	To be REMOVED. U/S dense *Phalaris* +/- *Scabiosa*	10-22
T-30	*Eucalyptus camaldulensis*	1	10.0	0	44	10	1.26	To be REMOVED. U/S dense *Phalaris* +/- *Scabiosa*	10-23

Tree (T) or Clump (C) #	Tree spp.	No. of trees	Height (m)	Hollows	Diam. (cm)	Canopy dieback (%)	Biodiv. Score	General comments	Photo #
	var. *camaldulensis*								
T-31	*Eucalyptus camaldulensis* var. *camaldulensis*	1	8.0	0	45	50	0.54	To be REMOVED. U/S dense *Phalaris +/- Scabiosa*	10-24
T-32	*Eucalyptus camaldulensis* var. *camaldulensis*	1	6.0	0	35	90	0.22	To be REMOVED. U/S dense *Phalaris +/- Scabiosa*	10-25
T-33	*Eucalyptus camaldulensis* var. *camaldulensis*	1	8.0	0	60	50	0.58	To be REMOVED. U/S dense *Phalaris +/- Scabiosa*	10-26
T-34	*Eucalyptus camaldulensis* var. *camaldulensis*	1	10.0	0	52	5	1.42	To be REMOVED. U/S dense *Phalaris +/- Scabiosa*	10-27
T-35	*Eucalyptus camaldulensis* var. *camaldulensis*	1	6.0	0	29	80	0.20	To be REMOVED. U/S dense *Scabiosa*	10-29
T-36	*Eucalyptus camaldulensis* var. *camaldulensis*	1	8.0	0	32	5	0.63	To be REMOVED. U/S dense *Phalaris +/- Dactylis glomerata +/- Scabiosa*	10-30
T-37	*Eucalyptus camaldulensis* var. *camaldulensis*	1	9.0	0	54	10	1.33	To be REMOVED. U/S dense *Phalaris*	10-32
T-38	*Eucalyptus camaldulensis* var. *camaldulensis*	1	11.0	0	54	50	1.07	To be REMOVED. U/S dense *Phalaris*	10-33
T-39	*Eucalyptus camaldulensis* var. *camaldulensis*	1	7.0	0	40	60	0.44	To be REMOVED. U/S dense *Phalaris*	10-34
T-40	*Eucalyptus camaldulensis* var. *camaldulensis*	1	7.0	0	38	50	0.46	To be REMOVED. U/S dense *Phalaris*	10-35
T-41	*Eucalyptus camaldulensis* var. *camaldulensis*	1	9.0	0	78	15	2.18	To be Minor PRUNE. U/S dense *Phalaris*	10-36
T-42	*Eucalyptus camaldulensis*	1	16.0	0	95	30	3.63	To be REMOVED. U/S dense exotic grasses	10-37

Tree (T) or Clump (C) #	Tree spp.	No. of trees	Height (m)	Hollows	Diam. (cm)	Canopy dieback (%)	Biodiv. Score	General comments	Photo #
	var. *camaldulensis*								
T-43	*Eucalyptus camaldulensis* var. *camaldulensis*	1	15.0	0	80	20	3.48	To be MINOR PRUNE. U/S exotic grasses	10-38
T-44	*Acacia melanoxylon*	1	4.5	0	22	10	.44	Avoided	10-39
C-C	*Acacia melanoxylon*	8	9.0	0	30	10	1.31	To be MINOR PRUNE. U/S mown exotics	10-40
C-D	*Eucalyptus camaldulensis* var. *camaldulensis*	6	12.0	0	40	20	1.23	To be REMOVED.	10-41
C-E	*Eucalyptus camaldulensis* var. *camaldulensis* 15 adults, 4 juveniles)	19	12.0	0	40	20	1.23	MINOR PRUNE	10-42
C-F	*Acacia melanoxylon*	18	5	0	10	50	.21	Avoided	10-43
C-G	*Eucalyptus camaldulensis* var. *camaldulensis*	22	12.0	0	45	30	1.20	MINOR PRUNE	10-44

Note; several patches, trees are avoided, left in table for completeness, in case there is a change and to demonstrate mitigation

In addition to the native vegetation discussed above, the survey recorded the following amenity vegetation which will be impact but is not subject to clearance approval; recorded here for completeness (Table 4). Note Amenity Trees S_AT5 and S_AT6 (both *Casuarina* sp.) will be retained and included below for completeness. As per DIT's SOP, any amenity plantings lost will be offset at a ratio of 1:1 within the region or via payment into DIT's amenity planting fund.

Table 4: Amenity Plantings (Not Subject to NV Clearance Approval)

Amenity Tree / Patch #	Description
S_AT1	Amenity Tree 1: To be REMOVED. Blue Gum (*Eucalyptus leucoxylon* ssp.). U/S of exotic grasses and herbs.
S_AT2	Amenity Tree 2: To be REMOVED. *Eucalyptus* sp (juvenile). U/S of exotic grasses and herbs.
S_AT3	Amenity Tree 3: To be REMOVED. *Casuarina* sp. U/S of exotic grasses and herbs.
S_AT4	Amenity Tree 4: Minor Prune. Sugar Gum (*Eucalyptus cladocalyx*). U/S of exotic grasses and herbs.
S_AT5	Amenity Tree 5: Retain/avoided. Sheoak (*Allocasuarina verticillata*) over exotic grasses.
S_AT6	Amenity Tree 6: Retain/avoided. Sheoak (*Allocasuarina verticillata*) over exotic grasses.

S_AP1	Amenity Patch 1: Four Trees RETAINED/avoided. Golden Wattle (*Acacia pycnantha* x1), Exotic *Eucalyptus* sp., *Melaleuca* spp. (x 2). U/S of dense *Phalaris*, *Dactylis* +/-*Scabiosa atropurpurea*
S_AP2	Amenity Patch 2: Thirty-one (31) Trees *Eucalyptus camaldulensis* (x 2), *Eucalyptus leucoxylon* ssp. (x approx.. 22), *Melaleuca* sp. (x 5), *Allocasuarina verticillata* (x 1), *Casuarina* sp (1). U/S of exotic grasses. Portion of patch to be REMOVED (0.16ha)
S_AP3	Amenity Patch 3: planted River Red Gum (x 2), dead trees (x 4) over exotic grasses, 0.01 ha to be removed.
S_AP4	Amenity Patch 4: planted Eucalyptus sp., *Allocasuarina verticillata* over exotic grasses, 0.01 ha to be removed.

Site map showing areas of proposed impact

Please refer Figure 2.

Photo log

Please refer Photo Appendix 2.

4.2 Threatened Species assessment

A 5km buffer was applied to the project area, herein referred to as the "study area".

Given the lack of native remnancy, broadscale clearance and disturbance in the region where the project is situated, and location adjacent a major highway, this environment does not provide core or critical e habitat for NPW of EPBC Act threatened flora or threatened communities, but would provide suitable occasional foraging or roosting habitat for some threatened species.

The limited habitat for fauna includes scattered native trees and amenity trees that could be used for roosting and foraging by common and threatened fauna (if present). This vegetation is not considered core vegetation for the fauna of the region but could provide temporary, stepping-stone habitat for more mobile species. Better quality habitat occurs in the vegetation Heritage Agreement Areas, Roadside Significant Sites, Pine Plantations and Conservation Parks northeast and east of the footprint and the nearby Glen Roy Conservation Park, which will not be impacted by this project in any way.

EPBC Listed Species

The 5 km PMST output for the footprint identified 16 EPBC listed as threatened fauna and 12 EPBC listed as Migratory species with potential to occur in the area, of which 3 species (or species habitat) are known to occur; South-eastern Red-tailed Black-Cockatoo (*Calyptorhynchus banksii graptogyne*), Satin Flycatcher (*Myiagra cyanoleuca*) and Growling Grass Frog (*Litoria raniformis*). There were BDBSA records for six of the initially identified EPBC species; Australasian Bittern (*Botaurus poiciloptilus*), South-eastern Red-tailed Black-Cockatoo, White-throated Needletail (*Hirundapus caudacutus,* Migratory, Vulnerable), Growling Grass Frog, Southern Bent-wing Bat (*Miniopterus orianae bassanii*) and Striped Legless Lizard (*Delma impar*). There are no BDBSA records for the other EPBC listed threatened species or any of the migratory species within 5km of the project area. There is no habitat for the Growling Grass Frog in the project footprint.

Only two of these species were considered to have potential to occur in the footprint / impact area; Striped Legless Lizard and South-eastern Red-tailed Black-cockatoo. An area of rare habitat for the Striped Legless Lizard (Delma impar) was identified in the region, in RSSD sites north of the footprint. Potential suitable, but not core habitat in the centre of the footprint (northbound side) has also been avoided by the project footprint. Scattered Trees were not considered suitable habitat for the Legless Lizard, hence only 1 EPBC listed threatened fauna was added to the appropriate column in the scattered tree scoresheet.

An EPBC listed Significant Impact Assessment was undertaken for the Striped Legless Lizard and the Red-tailed Black-cockatoo (See summaries in Table 5 below, and complete memo as Appendix 1.2 of the EHIAR).

No EPBC listed flora raised by the PMST are known (or with suitable habitat that is known) to occur within the study area. Bell Flower Hyacinth Orchid (*Dipodium campanulatum*), Nationally Endangered and NPW Act Vulnerable was suggested as likely to occur (PMST output), however there are no BDBSA records or suitable habitat within the impact area. The species has been recorded in a RSSD sites well north of the impact area, hence is suggested as an inclusion in the CEMP, refer EHIAR for further detail.

NPW listed Species

Limited habitat for NPW Act listed species occurs within the footprint. There are records within 5 km of the project area for the Red-tailed Black Cockatoo (as mentioned above) as well as records for a number of bird species, including the Yellow-tailed Black-cockatoo (also observed flying over the region during field survey). Core habitats for these species are not present within the footprint and will not be impacted by the project, however roosting habitat is present for some species (refer Table 5 below).

A range of other threatened species with the potential to occur within the 5 km study area have also been include below as per the Scattered Tree Assessment Guidelines and Scoresheet requirements. The list of numbers of species to be included in the Scattered Tree Scoresheet was emailed to Adam Schutz 7/4/2021 for approval and updated assessment is attached, given some errors in the initial extract (Appendix 3).

Table 5: Species observed on site, or recorded within 5km of the application area since 1995, or where the vegetation is considered to provide suitable habitat

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
Birds							
Calyptorhynchus banksii graptogyne (South-eastern Red-tailed Black-Cockatoo)	EN	EN	1, 5	1998	Endemic to the South-east of South Australia, this species occurs in a single population in a small area of south-eastern Australia delimited by Keith to Lucindale to Mt Gambier in South Australia (west of the project area) and also in Victoria. Restricted to Desert Stringybark *Eucalyptus arenacea* and Brown Stringybark *E. baxteri* woodlands occurring on deep aeolian sands in the Glenelg, Wimmera and Naracoorte Plains, and adjacent woodlands of River Red Gum *Eucalyptus camaldulensis*, Blue Gum *E. leucoxylon* and Buloke *Allocasuarina luehmannii* (Hill and Burnard 2001, Koch 2003) woodlands The species requires very old, large hollow eucalypts for nesting (Joseph et al. 1991) with nests being recorded in *Eucalyptus camaldulensis, E. baxteri, E. arenacea, E. viminalis, E. leucoxylon* and *E. fasciculosa*. The SE Red-tailed Black Cockatoo has also been recorded roosting in clumps of tall eucalypts Whilst, River Red Gums may provide	PMST suggests known **Possible** – core roosting, nesting and foraging habitat not present, but trees could be used for occasional roosting and foraging	Yes (only for RRG > 12 m tall)

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
					suitable occasional perching habitat, core nesting and core feeding habitat is not within the project area. Species not observed during survey. Smaller Red Gums are considered unlikely to provide habitat for this species e.g. <12 m, specie recovery plan suggests species prefers roosting in in RRG >23m (Commonwealth of Australia 2006).		
Entomyzon cyanotis cyanotis (Blue-faced Honeyeater)	-	R	2	no	Scattered River Red Gums within the study could provide occasional, suitable habitat for this species. However species prefer riverine forest, gardens and rainforest. Closest records for this species are known from the Naracoorte Caves region, with no verified recent records from the study or project area.	**Possible -** core habitat not present	No
Falcunculus frontatus frontatus (Eastern Crested Shrike-tit)	-	R	1	2005	8 records. Occurs in Eucalypt forest and woodland, riparian eucalypts, rainforest.	Possible - core habitat not present	No
Falco peregrinus macropus (Peregrine Falcon)	-	R	1, 6	2003	Widespread across Australia but generally uncommon to rare, this species builds no nests but uses ledges of cliff faces or sometimes large, very open tree hollows. Suitable nesting habitat does not present within the study area, which may provide general	**Possible -** core habitat not present, but will use RRG	Yes

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
					(not core) feeding habitat. No recent verified records exist for this species within the study or project area.		
Hirundapus caudacutus (White-throated Needletail)	V, MT		1, 5	1997	An aerial insectivore that is sparsely present but widespread in eastern and south-eastern Australia. They occur over many habitats including forests, hills and coastal cliffs with updrafts, and whilst predominantly aerial, will sometimes roost in the outer foliage of tall trees as night approaches. May be present as occasional visitor. Unlikely to be impacted given aerial nature and lack of habitat specialisation. Species not observed during survey.	PMST suggests may occur Possible – occurs mostly aerially across a wide range of habitats.	No
Stagonopleura bella interposita (Beautiful Firetail)		R	1	1999	2 records, heathlands, tea tree, paperbark, never far from running water.	No	No
Melithreptus gularis gularis (Black-chinned Honeyeater)		V	1	2005	6 records, generally uncommon. Prefers rough barked Eucalypts, dry forest and River Red Gum along watercourse.	Possible, but not core habitat.	No
Neophema chrysostoma (Blue-winged Parrot)		V	1	2003	8 records. Feeds in grasslands, weed areas, saltmarsh, nests in tree hollows, coastal and subcoastal eucalypt forest and woodland.	Possible, some suitable habitat, but not core habitat	Yes
Hylacola pyrrhopygia pyrrhopygia (Chestnut-rumped Heathwren SE)		V	1	1997	1 record. Uncommon prefers dense undergrowth.	Unlikely, no suitable habitat	No

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
*Petroica phoenicea (*Flame Robin)		V	1	2003	1 record. Breeds in upland Eucalypt forests and woodlands, colonises cleared or burnt areas, overwinter in open grassland habitats, grassy groundcover	Possible, but scattered tree not core habitat	No
Melanodryas cucullata cucullata (Hooded Robin (YP, MN, AP, MLR, MM, SE))		R	1	1999	3 records. Prefers lightly timbered habitats, woodlands and shrublands with wattles.	Possible, but scattered tree not core habitat	No
*Microeca fascinans fascinans (*Jacky Winter (SE))		R	1	2005	13 records. Prefers lightly timbered woodlands with open shrublayer, remnants near farmlands, roadside	Possible, use of scattered trees, but limited shrubs	Yes
Oriolus sagittatus sagittatus (Olive-backed Oriole)		R	1	2003	3 records. Range of habitats including open forest, woodland, riparian, treed farmland, mostly resident in northern Australia, summer migrant to south.	Possible, but only occasional range and not preferred habitat	No
Turnix varius (*Painted Buttonquail)*		R	1	1999	2 records, limited suitable grassland habitat available, prefers open forest with leaf-litter.	No	No
(*Myiagra inquieta*) *Restless Flycatcher*		R	1	2005	17 records. Prefers Eucalypt woodland, treed farmland, mallee but has declined in the south.	Yes, habitat present, but very open and sparse	Yes
Petroica boodang boodang (Scarlet Robin)		R	1	2003	3 records, Eucalypt forest and woodlands, but will disperse into farmlands and grasslands, perches from low foliage of trees	Possible, but scattered River Red Gum not core habitat	No
Stipiturus malachurus polionotum		R	1	1999	2 records. Prefers low heath near wetlands,	No	No

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
(Southern Emu-wren)					sand dunes, dense shrub.		
*Coracina papuensis robusta (*White-bellied Cuckooshrike*)*		R	1	2005	8 records. Widespread in Eucalypt forest, remnants in farmland, open to closed forest	Yes	Yes
Corcorax melanorhamphos (White-winged Chough)		R	1	2004	3 records, open woodlands and mallee, where leaf-litter present and moist.	No, no suitable leaf litter present	No
Myiagra cyanoleuca (Satin Flycatcher)	MT	E	5	No records	Found sparsely but widespread predominantly in eastern Australia, inhabiting vegetated gullies in eucalypt-dominated forests and taller woodlands, often near watercourses. There is no suitable habitat present within the project area. Species outside of range (Menkhorst et al. 2017). Species not observed during survey.	PMST Suggests known **Unlikely** - suitable habitat not present	No (refer Appendix 3)
Ninox connivens connivens (Barking Owl)	-	R	6	no	Less common in the SW and SE of Australia, this species is typically found in open country with stands of trees, along tree-line watercourses and in paperbark swamps. Closed record is from Big Heath CP west of the study and project area. Whilst, River Red Gums may provide suitable perching habitat, core nesting and feeding habitat is not within the project area. Species not observed or heard	**Possible** – core habitat not present, but will use River Red Gums	Yes

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
					during survey (noting nocturnal surveys were not undertaken).		
Tyto novaehollandiae novaehollandiae (Australian Masked Owl)	-	E	6	no	Roosts and nests in heavy forrest, hunts over open woodland and farmland (Menkhorst et al, 2017). Whilst, River Red Gums may provide suitable perching habitat, core nesting and feeding habitat is not within the project area. Species not observed or heard during survey (noting nocturnal surveys were not undertaken).	**Possible** – core habitat not present, but will use River Red Gums	Yes
Zanda funerea whiteae (Yellow-tailed Black Cockatoo)	-	V	1, 2, 6	2004	11 records. Feeds on seeds of native (and pine) trees and shrubs including *Eucalypts, Banksias, Hakeas and Xanthorrhea* (Menkhorst et al, 2017). Whilst, River Red Gums may provide suitable perching habitat, core nesting and feeding habitat is not within the project area. No recent verified records exist for this species within the study or project area, however, this species was observed flying over the project area during the survey.	**Known** – fly over during survey	Yes
Reptile							
Delma impar (Striped Legless Lizard)	VU	E	1, 5	2005 (wider search area, not within 5 km of the SOTL)	Mainly found in native grassland dominated by Kangaroo Grass (*Themeda triandra*) or	PMST suggests likely Possible – habitat is	No for scattered trees, yes for BAM

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
					Spear Grass (*Austrostipa* spp) but also recorded in grasslands with a high exotic component (Hadden, 1995). Species has also been noted to use, but is not restricted to, areas of cracking clay soil which were found in the southern section. There is the potential for the species to be present, due to the species use of both native and exotic grasslands, but the small isolated patch within the project area is unlikely to persist as viable habitat / populations due to lack of habitat connectivity with other individuals. Furthermore, the habitat was noted to be isolated and degraded and is not floristically diverse (only 5% native cover). The known larger populations in the Naracoorte vicinity are at Lake Ormerod and Hack's Lagoon and are protected habitat, which serve to sustain the genetic integrity of this lineage of the species. The project has been designed to minimise impact to NV 1 with only 0.032 ha likely to be disturbed.	poor quality and isolated from known regional populations.	

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
Frog							
Litoria raniformis (Growling Grass Frog)	VU	V	1, 5	2011	Inhabits areas within or on the edges of permanent water, such as slow-flowing streams, swamps, lagoons and lakes (Clemann & Gillespie, 2012), but also farm dams, irrigation channels, irrigated rice crops and disused quarries. There is no suitable habitat present within the project area. Species not observed (or heard) during survey.	PMST suggests known **Unlikely** – suitable habitat not present	No
Mammal							
Miniopterus orianae bassanii (Southern Bent-wing Bat)	VU	R	1, 5	2009 (wider study area not 5 km from SOTL)	Species roosts in caves, not tree hollows, and is unlikely to rely on the roadside trees for habitat. Species not observed during survey (noting nocturnal surveys were not undertaken)	PMST suggest likely **Unlikely –** suitable habitat not present within the project area.	No
Trichosurus vulpecula (Brushtail Possum)	-	R	1, 6	1997	Species rests in tree hollows, of which only one (medium sized hollow) was found to be present in the project area. Very limited, suitable, but isolated habitat present in the project area for this species. The habitat is unlikely to present core breeding and feeding habitat required to support this species. Species not observed during survey (noting nocturnal surveys were not undertaken).	**Possible -** core habitat not present	Yes

Species (common name)	EPBC Act	NP&W Act	Data Source	Date of Last Record	Species Known Habitat Preferences	Likelihood of Use for Habitat – Comments	Included in Scattered Tree Score Sheet Numbers
Vombatus ursinus (Common Wombat)	-	R	1,6	1997	Know to use roadsides as corridors, but less frequently observed along major highways. More commonly recorded from established warrens in the softer dirt batters along constructed drainage channels in the Upper South East of SA. Wombat warrens were not observed in the project area during the survey. Possible in paddocks with scattered trees if suitable foraging resources nearby, scattered trees not considered habitat.	**Possible –** suitable habitat not present within the project area.	No
Falsistrellus tasmaniensis (Eastern False Pipistrelle (Tasmanian Falsistrelle)	E	VU	1	2006	Prefers wet habitats where trees are more than 20 m high.	No	No
Petaurus breviceps (Sugar Glider)		R	1	1997	1 record. Prefers wet and dry sclerophyll forest	No	No

Source; 1- BDBSA, 2 - AoLA, 3 – NatureMaps 4 – Observed/recorded in the field, 5 - Protected matters search tool, 6 – others (e.g. Scattered Tree Assessment Manual)
NP&W Act; E= Endangered, V = Vulnerable, R= Rare
EPBC Act; Ex = Extinct, CR = Critically endangered, EN = Endangered; VU = Vulnerable

For additional species considered refer Appendix 3 Fauna assessment for scattered trees.

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 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 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

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 project footprint presented in Figure 2 provides the direct impact of this development on the local environment, which is inclusive of the construction envelope and the project elements (batters, culverts, railing, road surface). The direct, worst-case impact will result in:

- Loss of 37 scattered individual native remnant trees, minor pruning to 52 trees.
- Loss of 0.007 ha of NV1 (Exotic grassland with 5% native cover of herbs and grasses on cracking clays)
- Loss or partial loss of 5 amenity trees and 3 amenity patches (not subject to this approval)

A construction laydown area will be restricted to an existing laydown area located approximately 50m down Struan House Road at MMP 125.1 and is approximately 70 m x 14 m. There are no Roadside Significant Sites nearby (refer to the EHIAR).

The hydrology of the area will not be significantly altered from its current state, with culverts installed / replaced to enable movement of water across the landscape. There are no watercourses or swamps within the project area.

Other general construction risks will be appropriately managed and mitigated with a Construction Environmental Management Plan (CEMP) to be developed for the project; sedimentation, dust, potential off target damage to tree root zones of trees not being removed, the use of clean, locally sourced fill, control of weeds and pests, fauna clearances prior to removal of habitat etc.

This project is the central of three overtaking lanes being considered for the Riddoch Highway in this region (noting all three have been determined as necessary to improve safety in their own right, and not that this is one of three alternative options). Each project is separated by more than 10 km, and as such, they have been treated as separate, independent project clearances, as advised by DIT.

Refer EHIAR (Jacobs 2021a) and Engineering Design Reports (Jacobs 2021b) for further detail

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

The Riddoch Highway is one of South Australia's major freight and commuter corridors and the main access through to Mt Gambier and Melbourne. Historically the road has been the location of many major accidents and fatalities (RAA reported nearly 200 vehicle crash-related injuries and 8 deaths in the period 2013-2017, (2019)). This project is one of three separate overtaking lanes being considered for the Riddoch Highway, which aims to improve safety and reduce accidents and fatalities.

A pre-feasibility study conducted by DIT in 2012 notes that a do-nothing scenario is not acceptable in this circumstance. This study provided a cost v benefit analysis, considering avoidance (do nothing case) and minimisation (do something case(s)) of impact to a range of factors including ecological (and other) environments. DIT determined that the project should proceed based on the outcomes of this assessment, and then identified three preferred areas that represented a compromise between all factors considered, including minimising impact to scattered native trees.

An initial engineering survey and aerial imagery survey identified trees and other constraints in the region. This information was used to identify broad study areas. Desktop and field assessment was undertaken to inform engineering design, including recommendations to avoid any potential Striped Legless Lizard Habitat and large River Red Gums with hollows.

The final footprint has been refined to conform to updated road standards and avoid vegetation impacts (specifically scattered remnant trees), where possible. A footprint was developed (October 70% design) and this was refined to conform to updated road standards and avoid vegetation impacts (specifically scattered remnant trees), where possible. The October (70% design) initially proposed 89 scattered trees for clearance. 100% design changes has minimised impacts to trees (e.g. removal of 37, minor prune of 52). Minimization features include use of steeper batters and use of steal barriers, as well as pruning slight overhang, rather than removal of trees. It is noted that trees 19-22 and 28-40 require removal for a combination of batters and line of site (safety).

Refer EHIAR (Jacobs 2021a) and Engineering Design Reports (Jacobs 2021b) for further detail.

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).

DIT provided an initial preferred development envelope for the SOTL, which represented a compromise between all factors considered, including minimising impact to scattered native trees. The SOTL design has been development to retain the existing horizontal road alignment as much as possible, thereby minimising the disturbance footprint and associated impacted to native vegetation. Minor adjustments have been made only, and include curve widening for all curves and increasing nearside shoulder widths to 2.0m, enabling the road to cater for the new PBS level 3 design vehicles and to accommodate a 1.4m wide centre line treatment. Both upgrades are in line with current road design standards implemented to enhance road safety and reduce the likelihood of head-on collisions.

To further minimise impact to native vegetation within or near the road corridor, 1(vertical) to 3(horizontal) batter slopes with safety barrier protection have been implemented where possible (i.e. where sight visibility requirements are not impacted), reducing the overall disturbance footprint. Where not possible, batter slopes have been designed as 1 (vertical) to 6 (horizontal) slopes to provide an acceptable balance between motorist safety, cost of construction and potential impact to native flora and fauna.

Construction envelopes will be minimised in and around NV 1, such that only 0.007 ha of a total 0.196 ha will be lost (noting also that this native vegetation association is present in a very degraded state with only 5 % native cover within a largely exotic vegetation association). The tree root zones of adjacent scattered native trees not being removed by the development will be protected to prevent any potential off-target damage.

Reductions in the number of trees to be removed and or pruned have been made between 70% and 100% design, further demonstrating minimisation efforts. Refer EHIAR (Jacobs 2021a) and Engineering Design Reports (Jacobs 2021b) for further detail.

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

The disturbance proposed by this project is largely permanent including a new overtaking land, batters, culverts and standard road furniture.

Non-permanent features (e.g. a laydown yard) will be located in a suitable already cleared or non-native cropping paddock nearby. Construction envelopes will be minimised as discussed above and managed for weeds, and rehabilitated with low cover in immediate proximity to the road as per safety requirements. Further detail would be provided in the project Construction Environmental Management Plan.

All vegetation (native remnant and amenity plantings) will be offset as per DIT's Vegetation Removal Policy (2020) and Standard Operating Procedure as endorsed by the NVC (DPTI, 2020).

d) Refer EHIAR (Jacobs 2021a) and Engineering Design Reports (Jacobs 2021b) for further detail.***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.

The losses described within will be offset by payment into the Native Vegetation Fund.

Amenity plantings (not considered by this application) will also be offset at a ratio of 1:1 by payment into the DIT amenity fund (e.g. $150 per amenity tree / shrub or $5,000 / hectare).

Refer EHIAR (Jacobs 2021a) and Engineering Design Reports (Jacobs 2021b) for further detail.

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	Considerations
Principle 1a - it comprises a high level of diversity of plant species	Relevant information NV1 – Less than 5% native cover within native vegetation association dominated by exotic species (Phalaris and Cock's Foot) of Sheep's Burr *(Acaena echinata),* Rough Raspwort *(Haloragis aspera),* Native Bluebell *(Wahlenbergia sp.),* Spear-grass *(Austrostipa sp.),* Matt-rush *(Lomandra sp.)* and Emu Grass *(Distichlis distichophylla).* A total of six native species recorded. The scattered trees consist predominantly of *Eucalyptus camaldulensis* var. *camaldulensis* (River Red Gum) with occasional *Acacia melanoxylon* (Blackwood Wattle)
	Assessment against the principles Bushland Native Plant Diversity Score - <10 – not at variance. It does not contain a high level of diversity of native plant species.

	Moderating factors that may be considered by the NVC N/A
Principle 1b - significance as a habitat for wildlife	Relevant information List of threatened species that were recorded or may use the vegetation: *Delmar impar* (Striped Legless Lizard) – may use BAM / VA1 but not core habitat *Tyto novaehollandiae* (Australian Masked Owl) – not core habitat, potential foraging habitat. *Vombatus ursinus* (Common Wombat) – not core habitat, would provide some foraging habitat, but is exposed, no recent records. The vegetation (BAM / VA1) does not support a high diversity of animal species. The vegetation is exposed roadside vegetation, but would provide a corridor for movements between other areas of native vegetation, is not a habitat refuge, but is in a heavily cleared areas, adjacent a major highway. Fauna assessment indicated that 1 EPBC listed species (known in PMST) had potential to utilise the scattered trees for occasional roosting (only trees that were > 12 m in height, noting that the species recovery plan suggests species preference is roosting trees > 23m. Core foraging and nesting trees do not occur within the proposed clearance area. Refer Significant Impact Assessment / Appendix 1.2 of EHIAR. Refer Appendix 3 (fauna assessment) for the threatened species included in scattered tree sheets). Patches; Threatened Fauna Score – 1.1 Unit biodiversity Score – 6.88 Trees; Fauna Habitat Score – range from 1.4 (Blackwood Wattles and River Red Gum < 6m tall) to 1.8 (River Red Gum 9-16 m high with no hollows), 1 dead RRG with medium hollow. Biodiversity Score – for the trees range from 0.33 to 4.13, TBS for the 37 trees is 119.74
	Assessment against the principles Seriously at Variance (e.g. for scattered trees TBS > 7 or Threatened fauna habitat score ≥ 1.2) Fauna habitat score is 1.4 to 1.8 for River Red Gums and Blackwood Wattle At Variance – - No individual scattered trees with TBS > 7, four clumps of trees with TBS >7 (e.g. 8 Blackwood Wattles that will have major prune, TBS of clump = 10.45; 19 River Red Gum that will be minor pruned, 1 potential removed related to SRZ impact (includes 4 juveniles), TBS of clump = 23.4; 22 River Red Gum that will be minor pruned, 2 potential removed related to SRZ impact TBS of clump is 26.38). Not At Variance BAM 1NVA 1 – Unit Biodiversity Score < 50 (6.75)
	Moderating factors that may be considered by the NVC As per the Significant Impact Assessment undertaken for the key EPBC listed species (refer Jacobs 2021a EHIAR Appendix 1.2), it is considered that the clearance will not lead to a long-term decrease in the size of a population, reduce the area of occupancy, fragment existing populations, adversely affect critical habitat, modify habitat that will result in species decline, result in invasive species or interfere with the recovery of species. Therefore, it is considered that the clearance of the 39 Scattered River Red Gums and 1 Blackwood Wattle, major pruning of a clump of Blackwood Wattle on a fenceline and minor pruning of 41 trees, in relation to fauna score being seriously at variance could be reduced to 'At Variance'.

Principle 1c - plants of a rare, vulnerable or endangered species	Relevant information No threatened flora were recorded in NV 1. Given the level of disturbance, the dominance by dense exotic species, and it's persistence isolated within an exotic landscape, it is unlikely to support threatened native flora into the future. The scattered trees recorded (*Eucalyptus camaldulensis* var. *camaldulensis* and *Acacia melanoxylon*) are not rare, vulnerable or endangered species under state or federal legislation.
	Assessment against the principles Not at variance.
	Moderating factors that may be considered by the NVC N/A
***Principle 1d - the vegetation comprises the whole or part of a plant community that is Rare, Vulnerable or endangered*:**	Relevant information NV1. is bounded to the west by grazing paddocks with scattered remnant *Eucalyptus camaldulensis* ssp. *camaldulensis* and likely would have formerly been a Red Gum woodland with a sedge/grass/herb-dominated understorey. In its current poor state, it would no longer be recognised as containing sufficient structure or species to function and be considered part of this vegetation association. The scattered trees recorded (Eucalyptus camaldulensis var. camaldulensis and Acacia melanoxylon) are not part of a plant community that is Nationally Rare, Vulnerable or Endangered. They could be considered a very degraded representation of a community from the SA Provisional List of Threatened Ecosystems of South Australia; VULNERABLE Eucalyptus camaldulensis var. camaldulensis Woodland on seasonally inundated flats. This community is reduced in extent and threatened by drainage, extensive clearance and grazing. Inadequately conserved in Mary Seymour CP, Big Heath CP, Penola CP and Glen Roy CP. This ecosystem is not riparian. While subject to periodic flooding, the extent and frequency of flooding has historically been reduced in the region due to significant disruption and regulation (e.g. installation of road historic networks and culverts influencing the extent and duration of flooding events, and installation and operation of the Upper South East Drainage Scheme to facilitate agriculture). The SOTL project area is not located within a riparian ecosystem. The River Red Gums present are also as scattered individuals, and not of sufficient density to be considered a 'woodland', with an absence of native understorey. In addition, some of the trees adjacent the road reserve show evidence of historical disturbance / coppice.
	Assessment against the principles As above the proposed clearance includes scattered River Red Gums in the south east which could be considered a poorer representative of the above SA Provisional Threatened Ecosystem, but no longer persists as a 'woodland' on seasonally inundated flats.
	Moderating factors that may be considered by the NVC Total Biodiversity Score for all of these trees is 119.74 (total from the scattered trees sheet which includes clumps). Individual Biodiversity TBS scores for all trees are <. Clump C has TBS 10.45, minor prune of 8 *Acacia melanoxylon;* clump D has TBS 7.76, removal of 6 River Red Gum, clump E has TBS 23.4, minor prune of 19 River Red Gum, clump G has TBS 11.08, minor prune of 22

	River Red Gum. Clearance of higher value trees has been either avoided or minimised wherever possible. The trees to be removed may be representative of the community, but the location is in a heavily cleared area, used for agriculture and adjacent a major highway, with a modified drainage regime, and therefore is likely to be a poorer representative and provide limited opportunity to fauna. There is representative community conserved in nearby Glen Roy CP. It is considered that clearance of 6 River Red Gums and pruning of 5 River Red Gums would not result in a long-term decrease in the size of the SA provisional Vulnerable River Red Gum community, reduce the extent, fragment the existing extent, adversely affect critical habitat, modify habitat that will result in the community's decline, result in invasive species or interfere with the recovery of the community. Therefore, it is considered that the clearance of the 39 Scattered River Red Gums adjacent fencelines and in road reserves adjacent a major highway and the pruning of up to 41 scattered River Red Gums adjacent the Riddoch Highway could be reduced to 'At Variance'.
Principle 1e - it is significant as a remnant of vegetation in an area which has been extensively cleared.	Relevant information Refer Table 1 above for IBRA statistics. The SOTL lies within the: • Glenroy IBRA association (0%), estimated to retain 0% native vegetation, other than scattered trees • Lucindale IBRA Subregion, or which there is an estimated 13 % remnant of native vegetation. The native vegetation in the region of the SOTL project is in keeping with that described by the Glenroy IBRA Association; scattered remnant paddock trees mostly River Reg gum (*Eucalyptus camaldulensis*) with some smaller Blackwood (*Acacia melanoxylon*) and Golden Wattle (*Acacia pycnantha*), together with sparse roadside, rural and residential amenity tree plantings (various locally indigenous, non-indigenous and exotic species), over very sparse (if any) remnant native understorey scattered amongst a mixture of common exotic pasture grasses. The native vegetation remaining is highly fragmented and of varying quality, surrounded by agricultural landscape of cropping and pasture. The footprint itself is not mapped as native vegetation in Nature Maps (NatureMaps, 2020).
	Assessment against the principles Seriously at Variance (remnancy <3%, TBS 5-500) The clearance of 37 trees and minor pruning of 52 trees has a TBS of 119.74 in an area where remnancy is 0%. The clearance of 0.0071 ha of NVA BAM 1 has a TBS of 0.05. At Variance N/A
	Moderating factors that may be considered by the NVC Given the location of these trees in the landscape, adjacent a major highway, and the fact that there are numerous scattered trees retained within surrounding paddocks that would provide better quality habitat for fauna with reduced risk of collision with vehicles, it is considered that the clearance will not significantly impact the River Red Gums as a species or a vegetation community.
Principle 1f - it is growing in, or in association with, a wetland environment.	Relevant information NV 1 and the scattered trees described within are not part of a wetland environment or growing in association with a wetland environment.
	Assessment against the principles Not at variance.
	Moderating factors that may be considered by the NVC N/A
Principle 1g - it contributes significantly	Relevant information The larger River Red Gum trees (E. camaldulensis) contribute to the amenity of the area in contrast to the largely cleared agricultural land either side of the road.

to the amenity of the area in which it is growing or is situated.	The locality comprises large allotments used primarily for agricultural purposes. Dwellings sited on these allotments are sensitive to landscape change. Various trees and shrubs adjacent the Highway are present within the road reserve throughout the project alignment, contributing to a softened, attractive rural environment. Vegetation removal has been limited where possible, to maintain the outlook available from residential buildings. (refer Section 3.3.2 in the EHIAR document for further assessment about cultural / historical value and landscape character) In addition, amenity plantings (not the subject of this application) will be replaced where possible within the region at a ratio of 1:1, and are replacements likely to comprise indigenous, native species.
	Assessment against the principles Not at variance.
	Moderating factors that may be considered by the NVC Vegetation removal has and will be limited where possible, to maintain the outlook available from residential buildings, and to align with safety requirements of the Riddoch Highway.

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	Removal of 40 trees (37 live River Red Gum, 1 dead RRG, 1 Blackwood Wattle. Major Prune of 8 Blackwood Wattle Minor Prune of 41 River Red Gum
	Area (ha)	0.007 ha of NV1 degraded grassland
	Total biodiversity Score	119.74 (scattered trees), 0.05 (degraded grassland)
Seriously at variance with principle 1(b), 1(c) or 1 (d)		1(b), but moderating factors could reduce to 'At Variance'
Risk assessment outcome		Level 4 (Level 3 with TBS <250, but escalating factors, however associated moderating factors suggest could remain at level 3)

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

Clearance Area(s) Summary table

Insert table from the Summary Clearance Table for ***patches*** of vegetation assessed using the Bushland or Rangeland Assessment Method.

The following table summarises relevant inputs from Appendix 2.

Block	Site	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
NV1	S_BAM_1	1.1	1	0	0.08	6.88	0.0071	0.05	1	0	0	0.23		
						Tot	**0.032**	**0.22**				**0.05**	**$38.55**	**$2.12**

Scattered trees Summary table

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Biodiversity score	Loss factor	SEB Points required	SEB Payment	Admin Fee
9	1	1.8	0	4.127262	1	4.33	$3,257.07	$179.14
10	1	1.8	0	1.0033361	1	1.05	$791.79	$43.55
11	1	1.8	0	2.3398505	1	2.46	$1,846.52	$101.56
12	1	1.8	0	3.5111397	1	3.69	$2,770.85	$152.40
13	1	1.8	0	1.2687321	1	1.33	$1,001.23	$55.07
14	1	1.8	0	2.0063795	1	2.11	$1,583.35	$87.08
15	1	1.8	0	2.2213139	1	2.33	$1,752.97	$96.41
16	1	1.8	0	0.5002195	1	0.53	$394.75	$21.71
17	1	1.8	0	2.2159624	1	2.33	$1,748.75	$96.18
18	1	1.8	0	2.0734221	1	2.18	$1,636.26	$89.99
19	1	1.8	0	1.2695698	1	1.33	$1,001.89	$55.10
20	1	1.8	0	0.6114179	1	0.64	$482.51	$26.54
21	1	1.8	0	0.2663149	1	0.28	$210.16	$11.56
22	1	1.8	0	0.3648194	1	0.38	$287.90	$15.83
23	1	1.8	0	0.332667	1	0.35	$262.53	$14.44
24	1	1.8	0	0.332667	1	0.35	$262.53	$14.44
25	1	1.4	0	0.4904499	1	0.51	$387.04	$21.29
26	1	1.4	0	0.2154303	0	0.00	$0.00	$0.00
27	1	1.8	0	2.4582307	0	0.00	$0.00	$0.00
28	1	1.8	0	1.3772028	1	1.45	$1,086.83	$59.78
29	1	1.8	0	1.2957196	1	1.36	$1,022.53	$56.24
30	1	1.8	0	1.26	1	1.32	$993.98	$54.67
31	1	1.8	0	0.54	1	0.57	$428.25	$23.55

Tree or Cluster ID	Number of trees	Fauna Habitat score	Threatened flora score	Biodiversity score	Loss factor	SEB Points required	SEB Payment	Admin Fee
32	1	1.4	0	0.22	1	0.23	$171.61	$9.44
33	1	1.4	0	0.58	1	0.61	$455.01	$25.03
34	1	1.8	0	1.42	1	1.49	$1,122.82	$61.76
35	1	1.4	0	0.20	1	0.21	$159.10	$8.75
36	1	1.8	0	0.63	1	0.66	$498.65	$27.43
37	1	1.8	0	1.33	1	1.40	$1,050.94	$57.80
38	1	1.8	0	1.07	1	1.12	$841.40	$46.28
39	1	1.8	0	0.44	1	0.46	$344.30	$18.94
40	1	1.8	0	0.46	1	0.48	$360.41	$19.82
41	1	1.8	0	2.18	0	0.00	$0.00	$0.00
42	1	1.8	0	3.63	1	3.81	$2,861.40	$157.38
43	1	1.8	0	3.48	0	0.00	$0.00	$0.00
44	1	1.4	0	0.44	0	0.00	$0.00	$0.00
C	8	1.4	0	1.31	0.4	4.39	$3,300.06	$181.50
D	6	1.8	0	1.23	1	7.76	$5,830.72	$320.69
E	18	1.8	0	1.23	0	0.00	$0.00	$0.00
E	1	1.8	0	1.23	1	1.29	$970.67	$53.39
F	18	1.4	0	0.21	0	0.00	$0.00	$0.00
G	20	1.8	0	1.20	0	0.00	$0.00	$0.00
G	2	1.8	0	1.20	1	2.52	$1,893.98	$104.17
Total	**109**			**55.76**		**57.31**	**$43,070.76**	**$2,368.89**

Totals summary table

	Total Biodiversity score	Total SEB points required	SEB Payment	Admin Fee	Total Payment
Application	55.81	57.36	$43,109.31	$2,371.01	$45,480.32

Economies of Scale Factor	0.5
Rainfall (mm)	578

It is noted that there are some discrepancies with formulae between the scattered tree sheet and the NVC clearance summary sheet, noted as an issue that NVC still need to resolve. It appears the TBS above (clearance summary sheet) is actually the Biodiversity Score per tree and doesn't appear to allow for the native clumps.

Scattered Tree Assessment Sheet (July 2020 Version) summary:

Total Biodiversity Score	119.74
Total SEB Points required	**56.61**
Total SEB $ required	**$45,170.19**

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.

The Data Report must propose how the SEB will be achieved in accordance with the SEB Policy and Guide, by providing the following information.

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. Provide information below.

☐ 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. Provide details below

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)
- If the proponent wishes to make the payment in stages, details of those stages, including clear dates or milestones in which payments will be made. Noting, for staged payments, payments must be received prior to clearance occurring, therefore staged payments are only suitable for projects where the clearance will occur in a staged manner.

The losses described within will be offset by payment into the Native Vegetation Fund.

As per the BAM sheet (Appendix 4), the loss of 0.007 ha of NV 1 will require a payment of $38.53 (ex GST) and an administration fee of $2.12 (ex GST) to offset 0.05 SEB points.

As per the scattered tree assessment scoresheet (Appendix 4), the loss of 40 scattered individual or clumps of native remnant trees (and some pruning) will require a payment of $45,170.19 (ex GST) to offset 56.16 SEB points.

Amenity plantings (not considered by this application) will also be offset at a ratio of 1:1 either by payment or direct on ground within the region as per DIT's Vegetation Removal Policy and Standard Operating Procedure (DPTI, 2020).

Payment will be made in full and upfront prior to commencement of works.

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8. Appendices

Appendix 1. PMST Output

Appendix 2. Photo Log

Appendix 3. Fauna Assessment Summary

Appendix 4. Scattered Tree Scoresheet / BAM Scoresheet

Appendix 5. Clearance Summary Scoresheet

Appendix 6. DIT Scoresheet