Clearing Assessment Report – CPS 818

We're working for Western Australia.

Great Eastern Highway

Upgrade Packages 4B and 5

September 2021

EOS 1775

D21#30894

Contents

1 PURPOSE

The purpose of this Clearing Assessment Report (CAR) is to provide a report detailing the assessment of native vegetation clearing that is proposed to be undertaken using the Statewide Clearing Permit CPS 818 issued to Main Roads Western Australia (Main Roads).

The CAR outlines the key activities associated with the proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the proposal using the ten Clearing Principles, and the strategies used to manage vegetation clearing.

2 SCOPE

2.1 Project Scope

Project Name: Great Eastern Highway Upgrade Packages 4B and 5 (SLK 311.8 – 327)

Project Purpose / Components: Great Eastern Highway (GEH) forms part of National Highway 94, and is a strategic freight, tourist and inter-town route. The efficiency and reliability of Great Eastern Highway is vital to the mining and agricultural sectors of the Wheatbelt and Goldfields regions.

Significant age and wear along sections of GEH is severely affecting the safety and efficiency of the highway. This route has been identified as the third riskiest road in regional WA for two consecutive RAC surveys, owing to the poor road condition. Of particular concern is the inadequate road formation and seal widths, and the narrow or absent shoulders. Between the towns of Merredin and Southern Cross, for the period 2012-2016, 47 crashes were recorded along GEH, resulting in two fatalities, 17 major injuries and 22 hospital admissions or medical attention.

Main Roads proposes to upgrade a 15 km section of GEH near the townsite of Bodallin. The proposal comprises the following components:

- 15.2 km of road reconstruction and widening to achieve an 11 m wide seal on an 11 m wide formation;
- Slight realignment of GEH through the townsite of Bodallin;
- New east-bound passing lane;
- Upgrade a westbound parking bay;
- Improvements to private property access;
- Improvements to intersections with local roads;
- Upgrade drainage infrastructure.

The proposed clearing undertaking using CPS 818 is: up to 17 ha.

The proposed temporary clearing undertaking using CPS 818 is: 0 ha.

Project Location(s): The proposal area is located on GEH (H005) between Straight Line Kilometre (SLK) 311.8 and 327. The proposal area is located between the townsites of Carrabin and Moorine Rock, and intersects the townsite of Bodallin, in the Shire of Yilgarn. Figures 1 – 3 show the proposal location.

MGA reference: Zone 50

- Start: 671158.99 mE, 6526667.21 mN
- Finish: 685497.03 mE, 6530952.93 mN

The following terms are used in this CAR:

- *Clearing area*: This area represents the area of native vegetation clearing for the proposal, comprising the designed earthworks and a buffer to allow for the movement of machinery during construction.
- *Proposal area*: the maximum area within which the clearing area will be located. This envelope is slightly larger than the clearing area to allow for minor changes to the proposal footprint as the design process continues, and account for unexpected changes that can occur during construction. The CAR has assessed all environmental values of the proposal area.

2.2 Assessment Report Scope

The assessment area is confined to a local area of 20 km ('study area'), as shown in Figure 2.

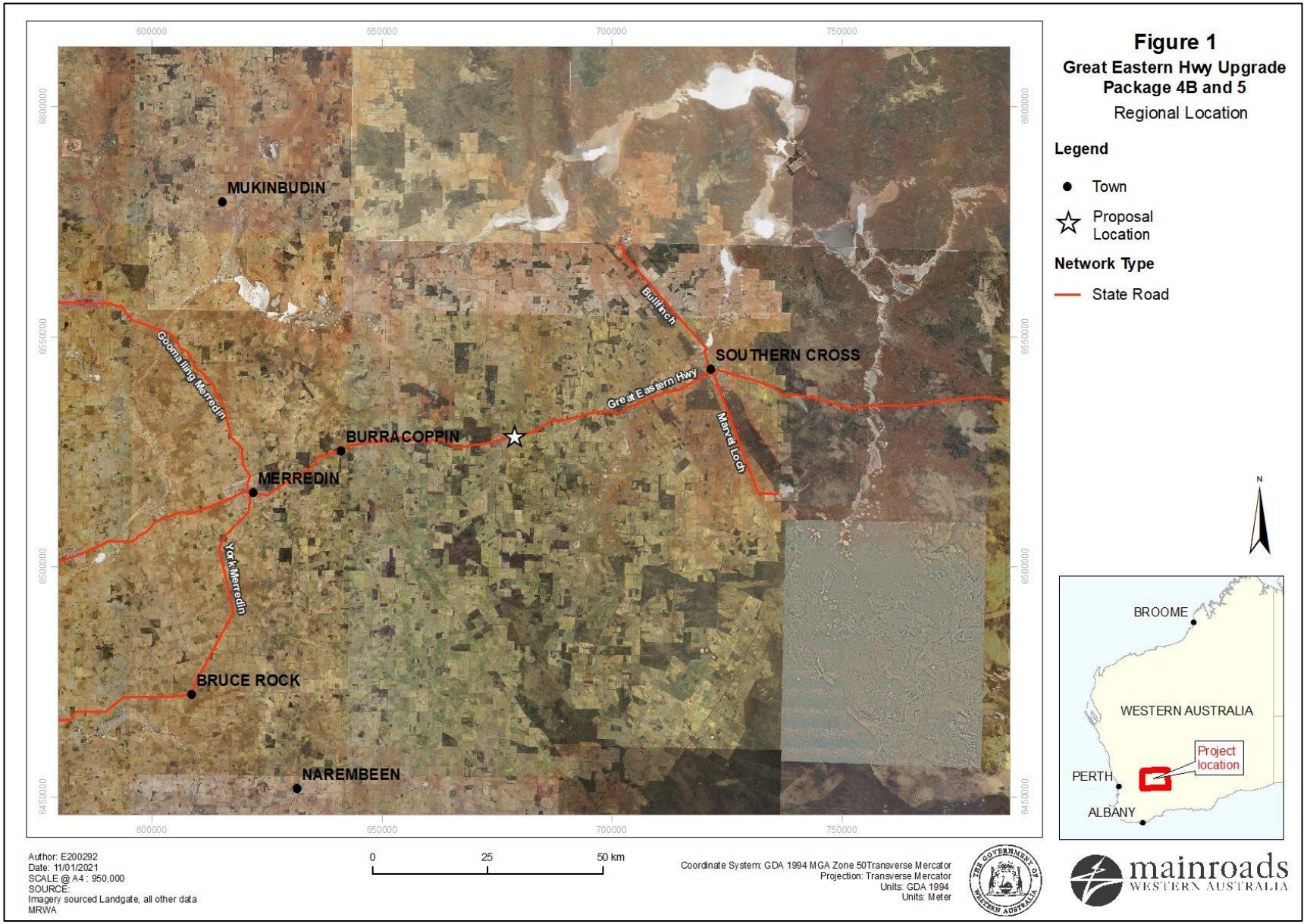

Figure 1. Proposal Regional Location

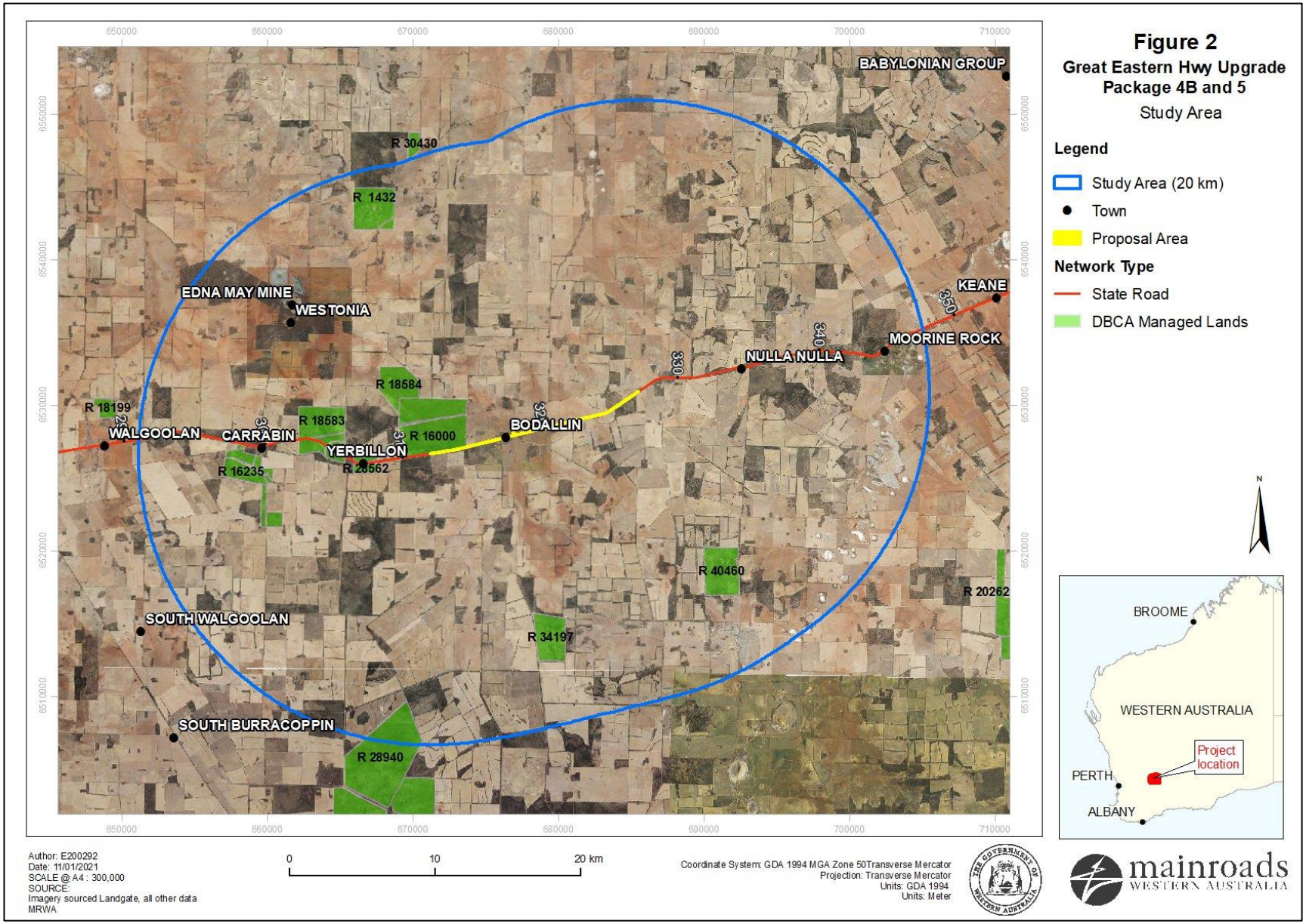

Figure 2. Study Area

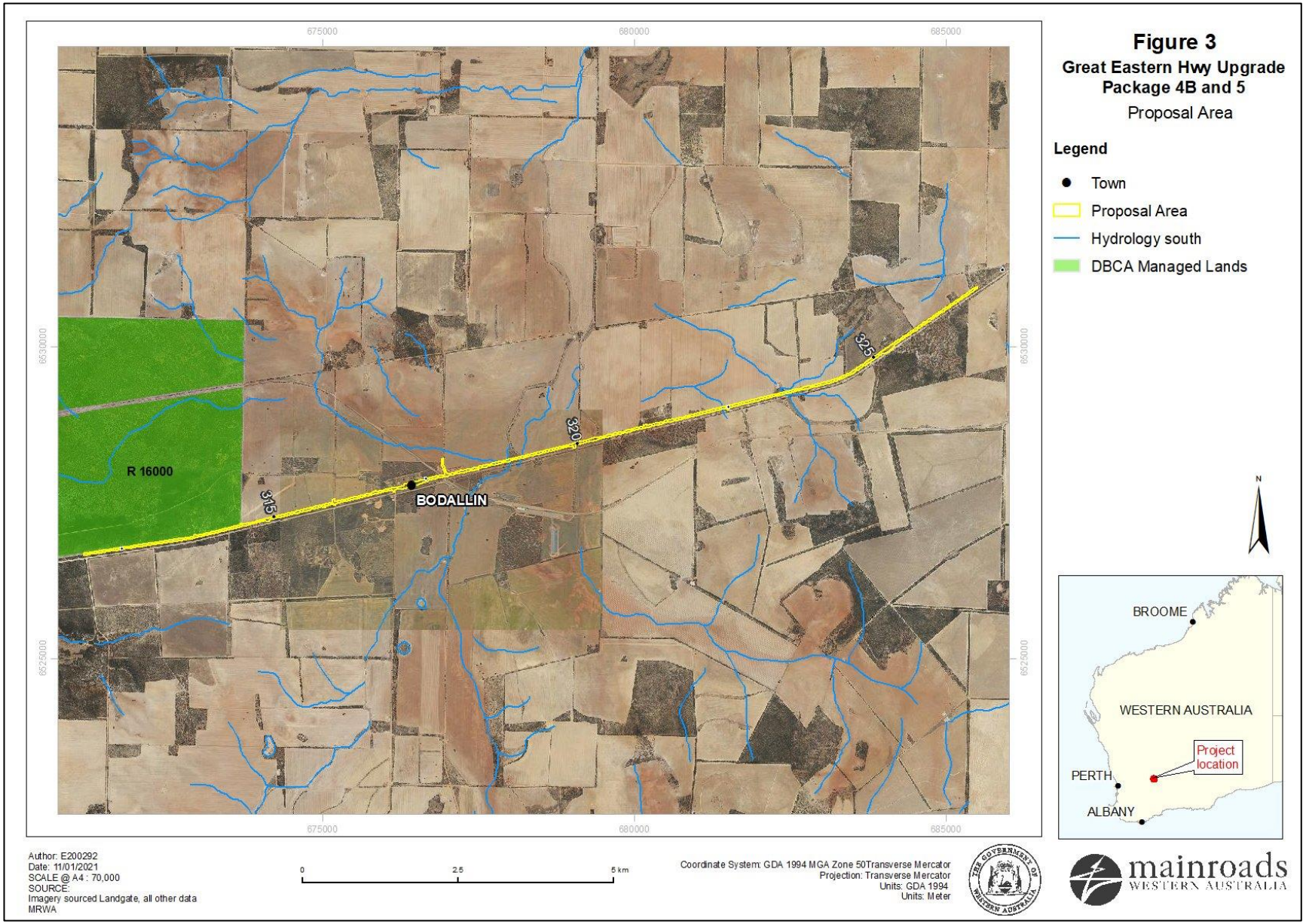

Figure 3. Proposal Area

2.3 Alternatives to clearing

There are several factors driving the proposed widening and resealing of this section of GEH, including the significant age and wear of the pavement, narrow or absent shoulders, and poor geometry. The current condition of GEH does not meet current road safety standards leading to poor safety outcomes for road users. The project has been developed to reduce the area of clearing as much as possible, which is outlined in Section 2.4 below, however some clearing will be necessary to achieve the safety objectives of the project.

Temporary ancillary activities such as site offices, storage areas, laydown areas and stockpiles will be restricted to previously cleared areas. Materials for the project will also be sourced from existing cleared areas such as farm paddocks to avoid additional clearing.

2.4 Measures to Avoid, Minimise, Reduce and Manage Project Clearing Impacts

The design and management measures implemented to avoid and minimise the clearing impacts by the project are provided in Table 1.

Table 1: Measures undertaken to Avoid, Minimise, Reduce and Manage the Project Clearing Impacts

Design or Management Measure	Discussion and Justification
Alignment to one side of existing road	Widening will be towards the northern side of the existing alignment, thereby reducing clearing in relatively better quality vegetation along the southern side of GEH.
Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas	The scope of the proposal is to upgrade and widen GEH along the existing alignment. Widening will utilise the existing cleared areas adjacent to the road, with only minor clearing required to achieve the full design width. This section of GEH requires a westbound parking bay. Main Roads will upgrade an old existing parking bay that exists within the proposal area instead of constructing a new bay.
Simplification of design to reduce number of lanes and/or complexity of intersections	The most significant change to the project was the removal of a westbound overtaking lane from the proposal. This section of GEH was considered strategically well positioned for a westbound overtaking lane given the proximity to other over-taking opportunities. However, widening GEH at this location to include an overtaking lane would have resulted in a larger area of clearing, including clearing in a Threatened Ecological Community (TEC). The overtaking lane was relocated to another package of work approximately 15 km west, thereby reducing clearing by approximately 1.3 ha. The design has been simplified by reducing excessive turning pockets and reducing earthworks by utilising existing ground levels where possible.
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	Access tracks will not be required. Half width construction methodology will be followed and traffic will be managed through the existing alignment. If side tracks are required for traffic managed, the location will be limited to existing cleared areas. During construction, temporary ancillary activities such as site offices, storage areas, laydown areas and stockpiles will be restricted to previously cleared areas.
Drainage modification	Existing culverts will be replaced to improve surface water flow.

2.5 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.3), Main Roads has also had regard to the below instruments.

Other Legislation of relevance for assessment of clearing and planning/other matters

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914*
- *Aboriginal Heritage Act 1972* (WA)

Other Relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (DEC, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, August 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities
- Approved Recovery Plans for threatened species
- EPBC Act Referral guidelines for the three threatened black cockatoo species
- Strategic advice - EPA

3 SUMMARY OF SURVEYS

3.1 Biological Survey

The proposal area is included in the Great Eastern Hwy Merredin to Southern Cross SLK 258.5 - 365.5 Biological Assessment that was conducted in October 2015 and January 2016 by GHD.

3.1.1 Summary of Biological Survey

A 60 m wide corridor was surveyed along GEH between Merredin and Southern Cross (GHD, 2016). The survey mapped eight vegetation types within and adjacent to the proposal area, comprising the following:

- VT01 - *Eucalyptus loxophleba* subsp. *lissophloia* open mallee forest;
- VT03 - *Allocasaurina* tall shrubland;
- VT04 - *Eucalyptus sheathiana* open mallee forest;
- VT05 - *Eucalyptus capillosa* subsp. *capillosa* open forest;
- VT06 - *Acacia* spp. and *Melaleuca* spp. tall open shrubland;
- VT09 - *Eucalyptus* spp. mallee woodland;
- VT10 - *Eucalyptus salubris* open forest;
- VT11 - *Borya sphaerocephala* herbland.

The vegetation condition ranges between 'excellent' and 'completely degraded'. Three of the vegetation types were inferred to represent Eucalypt Woodlands of the Western Australian Wheatbelt, which is listed as a Threatened Ecological Community (TEC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Eucalypt Woodlands TEC). This community is also synonymous with the state Priority Ecological Community (PEC) Eucalypt Woodlands of the Western Australian Wheatbelt (Eucalypt Woodlands PEC, Priority 3).

The Department of Biodiversity, Conservation and Attractions (DBCA)-priority listed flora taxa, *Phebalium ?drummondii* was potentially recorded within the proposal area. This species was not able to be definitively identified as the Priority 3 plant species *Phebalium drummondii*, due to the absence of flowers and/or fruit. No other Threatened or Priority flora were recorded along this section of GEH.

In terms of fauna, the field survey recorded 76 fauna species, consisting of 62 birds, ten mammals, three reptiles, and one amphibian between Merredin and Southern Cross. Of these, 67 were native species and nine were introduced species. There were no conservation significant fauna observed in the proposal area or surrounding vegetation. The nearest observation of conservation significant fauna to the proposal area was an individual of Malleefowl (*Leipoa ocellata*) recorded as road kill approximately eight kilometres west near Nature Reserve 18583.

The vegetation was found to provide five habitat types; *Allocasuarina* tall shrublands, Mixed shrublands, Eucalypt woodlands, Rehabilitated areas and Granite outcrops. The Eucalypt woodlands habitat contained 34 trees with a suitable diameter at breast height (DBH) for Threatened black cockatoos, 27 of which occur within the proposal area. The survey did not record any trees with suitable hollows for breeding.

No Malleefowl breeding activity (i.e. nesting mounds) was recorded at the time of the survey.

3.2 Threatened Ecological Community Assessment

The proposal area is included in the Great Eastern Hwy Merredin to Southern Cross SLK 258.5 - 365.5 Biological Assessment that was conducted in September 2018 by Astron. The biological assessment includes a targeted Eucalypt Woodlands TEC assessment.

3.2.1 Summary of Threatened Ecological Community Assessment

Astron (2018) conducted a targeted Eucalypt Woodlands TEC assessment along GEH to verify patches inferred to represent the TEC by GHD. The TEC assessment inspected *Eucalyptus*-dominated woodlands to verify the presence of Eucalypt Woodlands TEC against the key diagnostic criteria and condition thresholds contained in DotE (2015). The survey area was consistent with the GHD (2016) survey area, ie. an average of 60 m from GEH.

The targeted TEC assessment mapped 25.44 ha of Eucalypt Woodlands TEC within the survey area, including 4.55 ha within the proposal area. The community occurs in 12 different patches, and ranges from 'very good to good' to 'good to degraded' condition.

3.3 Targeted Flora Survey

Ecologia (2020) conducted a targeted flora survey of the proposal area in September 2019.

3.3.1 Summary of Targeted Flora Survey

Ecologia (2020) conducted a desktop assessment and targeted flora survey in spring 2019. The intent of the survey was to search for conservation significant flora species considered likely or potentially occurring in the proposal area, based on the vegetation types recorded in the biological survey. The survey did not record any Threatened or Priority flora in the survey area.

4 VEGETATION DETAILS

4.1.1 Proposal Site Vegetation Description

The proposal is located within the eastern Wheatbelt region, which is characterised by a mosaic of cleared agricultural land and patches of remnant native vegetation. In the local context, the proposal area is situated within a 100 m wide corridor of road reserve and unallocated crown land that is mostly vegetated.

The proposal area comprises the following eight vegetation types (GHD, 2016):

- *Eucalyptus loxophleba* subsp. *lissophloia* open mallee forest (VT01);
- *Allocasuarina* tall shrubland (VT03);
- *Eucalyptus sheathiana* open mallee forest (VT04);
- *Eucalyptus capillosa* subsp. *capillosa* open forest (VT05);
- *Acacia* spp. and *Melaleuca* spp. tall open shrubland (VT06);
- *Eucalyptus* spp. mallee woodland (VT09);
- *Eucalyptus salubris* open forest (VT10);
- *Borya sphaerocephala* herbland (VT11).

Approximately 54% of the proposal area is already cleared or highly degraded. The condition of the remaining areas of native vegetation range between 'excellent' to 'completely degraded' (EPA, 2016). Table 2 provides a summary of the vegetation condition within the proposal area:

Table 2: Vegetation condition of the proposal area

Condition	Area (ha)	Area (%)
Excellent	1.35	2.58%
Excellent to Very Good	6.83	13.09%
Very Good	3.03	5.80%
Very Good to Good	2.38	4.55%
Good	3.10	5.94%
Good to Degraded	2.99	5.72%
Degraded	1.42	2.73%
Degraded to Completely Degraded	2.48	4.76%
Completed Degraded	0.62	1.18%
Cleared	28.01	53.66%

Although the majority of vegetation has been mapped as Very Good to Good condition or better, it is worth noting that the vegetation condition mapping represents broad mapping of the survey area. The clearing area is restricted to vegetation directly adjacent to an existing road and cleared maintenance zone and will be affected by edge effects. Consequently, the proportion of vegetation in Very Good to Good or better condition is likely to be lower than the vegetation condition mapping indicates.

For a full description of the existing vegetation, refer to the biological assessment in GHD (2016).

Tables 3 and 4 provide details of the Pre-European Vegetation Associations with the proposal area and the remaining extents of these associations.

Table 3: Summary of Proposal Area's Mapped Pre-European Vegetation Associations

Pre-European Vegetation Association(s)	Clearing Description	Vegetation Condition	Comments
Vegetation Association 8 described as medium woodland; salmon gum and gimlet.	Clearing of up to 17 ha for road widening and reconstruction on GEH.	Excellent – Completely Degraded (EPA, 2016)	Vegetation description and condition determined from biological survey (GHD, 2016).
Vegetation Association 36 described as shrublands; thicket, *Acacia-Casuarina* alliance			
Vegetation Association 536 described as medium woodland; morrell & rough fruited mallee (*Eucalyptus corrugata*)			
Vegetation Association 1413 described as medium open woodland; Eucalypts over teatree			

Table 4: Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
Veg Assoc No. 8	**Statewide**	694,638.14	346,425.77	50%	7%
	IBRA Bioregion Avon Wheatbelt	356,571.81	50,340.31	14%	1%
	IBRA Sub-region Merredin	353,871.79	49,941.57	14%	1%
	Local Government Authority Shire of Yilgarn	163,920.73	59,992.64	37%	7%
Veg Assoc No. 36	**Statewide**	495,430.67	226,242.18	46%	6%
	IBRA Bioregion Avon Wheatbelt	300,996.97	72,745.12	24%	3%
	IBRA Sub-region Merredin	300,996.97	72,745.12	24%	3%
	Local Government Authority Shire of Yilgarn	73,850.98	39,909.36	54%	6%
Veg Assoc No. 536	**Statewide**	13,177.53	5,432.82	41%	10%
	IBRA Bioregion Avon Wheatbelt	11,170.84	3,970.04	36%	11%
	IBRA Sub-region Merredin	11,170.84	3,970.04	36%	11%
	Local Government Authority	6,806.66	3,170.92	47%	19%

Pre-European Vegetation Association	Scale	Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DBCA reserves
	Shire of Yilgarn				
Veg Assoc No. 1413	**Statewide**	1,679,916.32	1,286,855.48	77%	13%
	IBRA Bioregion Avon Wheatbelt	546,675.55	174,102.84	32%	2%
	IBRA Sub-region Merredin	546,675.55	174,102.84	32%	2%
	Local Government Authority Shire of Yilgarn	538,791.10	395,458.48	73%	19%

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the project's proposed clearing is likely to have a significant impact on the environment, the project was assessed against the ten Clearing Principles (Environmental Protection Act 1986, Schedule 5).

Each principle has been assessed in accordance with DWER's 'A Guide to the Assessment of Applications to Clear Native Vegetation' and other relevant CPS Decision Reports prepared by DWER.

The assessment has determined that the proposed clearing is at variance with principles (a), (e) and (f), not likely to be at variance to principles (b), (c), (g), (h), (i) and (j), and not at variance with principle (d).

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments	**Proposed clearing is at variance to this Principle**
	The proposal requires the clearing of 17 ha of native vegetation within a proposal area of approximately 52 ha. Approximately 54% of the proposal area is already cleared or highly disturbed and the remaining areas of native vegetation range between 'Excellent' and 'Completely Degraded' condition (GHD, 2016). The proposal area comprises the following eight vegetation types (GHD, 2016): • *Eucalyptus loxophleba* subsp. *lissophloia* open mallee forest (VT01); • *Allocasuarina* tall shrubland (VT03); • *Eucalyptus sheathiana* open mallee forest (VT04); • *Eucalyptus capillosa* subsp. *capillosa* open forest (VT05); • *Acacia* spp. and *Melaleuca* spp. tall open shrubland (VT06); • *Eucalyptus* spp. mallee woodland (VT09); • *Eucalyptus salubris* open forest (VT10); • *Borya sphaerocephala* herbland (VT11). Three *Eucalyptus*-dominated woodland vegetation types (VT01, VT05 and VT10) were inferred to align with the EPBC Act-listed Eucalypt Woodlands TEC and State equivalent Eucalypt Woodlands PEC (GHD, 2016). Follow-up targeted mapping conducted against the diagnostic criteria and condition thresholds outlined in DotE (2015) recorded 4.55 ha of this ecological community within the proposal area and an additional 20.89 ha outside of the proposal area but within 60 m of GEH (Astron, 2018). According to Department of the Environment (DotE, 2015), there is an estimated 930,075.8 ha of Eucalypt Woodlands TEC remaining in the Wheatbelt as of 2014. A comparison of DBCA's TEC spatial database against DAFWA remnant vegetation spatial mapping indicates up to 9,661 ha of Eucalypt Woodlands TEC potentially occurs within 10 km of the proposal area. The proposed clearing represents <0.001% of the total remaining extent of Eucalypt Woodlands TEC in the Wheatbelt, and approximately 0.05% of the extent in the surrounding 10 km. At the local scale, the potential clearing of up to 4.55 ha of Eucalypt Woodlands TEC represents approximately 18% of the extent mapped within the survey area (based on Astron, 2018). Aerial and ground level imagery indicates approximately 98 ha of Eucalypt woodlands occurs beyond the survey area where vegetation is contiguous with mapped Eucalypt Woodlands TEC. The total extent of the TEC adjacent to this section of GEH, based on Astron (2018) vegetation mapping and desktop extrapolation, is therefore potentially up

	to 123.44 ha (illustrated in Appendix 1). Consequently, the proposed clearing is more likely to represent approximately 4% of the local extent. The proposal was referred to the Commonwealth Department of Agriculture and Water (DAWE) under the EPBC Act (EPBC 2020/8746) given the potential significant impact to Eucalypt Woodlands TEC. The proposal was determined not to be a controlled action. Given the clearing will be confined to a narrow, linear strip of vegetation either side of GEH, and will not lead to significant community decline or fragmentation, the proposed clearing is not likely to have a significant impact on this community. No other Threatened or Priority ecological communities have been recorded in the proposal area (GHD, 2016; Astron, 2018). A total of 701 plant taxa are known to occur within the study area, including five Threatened and 22 Priority flora species (DBCA, 2020). The Priority 3 species *Phebalium ?drummondii* was potentially recorded within the proposal area (GHD, 2016). This species was not able to be definitively identified as the Priority 3 plant species *Phebalium drummondii*, due to the absence of flowers and/or fruit. A targeted conservation significant flora survey of the proposal area did not record this species or any other Threatened or Priority flora (Ecologia, 2020). A Level 1 fauna assessment of GEH between Merredin and Southern Cross, which includes the proposal area, recorded 76 fauna species, consisting of 62 birds, 10 mammals, 3 reptiles and 1 amphibian (GHD, 2016). No conservation significant fauna species were recorded in the proposal area at the time of the survey. There are historical records of Malleefowl (*Leipoa ocellata*) occurring within and adjacent to the proposal area (GIS Database). GHD (2016) recorded one individual of Malleefowl on the edge of GEH (roadkill) approximately eight kilometres west of the proposal area in Nature Reserve 18583. There was no evidence of any Malleefowl breeding activity at the time of the fauna survey or during opportunistic searches by Main Roads during project development. Vegetation within the proposal area is potentially suitable for Malleefowl, however the likelihood of Malleefowl using this vegetation is considered low, as discussed in principle (b). Twenty-seven suitable DBH trees for Carnaby's Cockatoo are present within the proposal area, none of which contain suitable breeding hollows. The proposal area contains suitable foraging habitat for Carnaby's Cockatoo, however no evidence of the species has been recorded in the area (GHD, 2016). Based on the above, the proposed clearing is at variance to this principle. Impacts to Eucalypt Woodlands TEC/PEC will be managed by the implementation of an offset.
Methodology	Astron (2018) DBCA (2020) DotE (2015) Ecologia (2020) GHD (2016) GIS Database: - Threatened and Priority Ecological Communities (Buffered) - Threatened and Priority Fauna - Threatened and Priority (DBCA) - Threatened and Priority (WA Herbarium)

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments	Proposed clearing is not likely to be at variance to this Principle
	Five habitat types have been recorded in the proposal area (GHD, 2016): • Allocasuarina tall shrublands; • Eucalypt woodlands; • Granite outcrops; • Mixed scrublands; • Rehabilitated areas. GHD (2016) also recorded Highly modified areas as providing very little habitat value to fauna. A desktop search identified eight conservation significant fauna species known to occur in the study area, and five species that potentially occur (DAWE, 2020; DBCA, 2020) The following species may be present in the proposal area based on the habitats present: • Carnaby's Cockatoo (*Calyptorhynchus latirostris* – Endandered); • Shield-backed trapdoor spider (*Idiosoma nigrum* – Endangered); • Chuditch (*Dasyurus geoffroii* – Vulnerable); • Malleefowl (*Leipoa ocellata* – Vulnerable); • Fork-tailed swift (*Apus pacificus* subsp. *pacificus* – Migratory); • Peregrine falcon (*Falco peregrinus* – Other specially protected fauna); • Tree-stem trapdoor spider (*Aganippe castellum* – P4). A level 1 fauna assessment over the proposal area did not record any evidence of these species occurring in the proposal area or surrounding vegetation (GHD, 2016). The Eucalypt woodlands habitat type is considered suitable foraging habitat for Carnaby's Cockatoo (GHD, 2016). The Mixed shrublands habitat type may also provide foraging habitat in the form of isolated foraging species, although GHD (2016) noted foraging resources along GEH are not likely to be high quality. In total, up to 9.19 ha of Eucalypt woodlands and 4.35 ha of Mixed shrublands occurs in the proposal area. The Eucalypt woodlands habitat also contains 27 suitable DBH trees, none of which contains suitable hollows for breeding. The proposal area is located at the eastern most extent of the modelled breeding range of Carnaby's Cockatoo (DSEWPaC, 2012). Recent estimates of the species' current distribution indicates Carnaby's Cockatoo is not likely to occur east of Merredin (EPA, 2019). This is supported by the absence of historical records in the study area; the nearest record to the proposal is approximately 50 km west near Merredin. The nearest known breeding record is north of Kellerberrin, over 100 km from the proposal area (pers. comm. WA Museum, 2020). The fauna assessment did not record any evidence of Carnaby's Cockatoo breeding, roosting or foraging in the proposal area during the field survey (GHD, 2016). Noting the lack of Carnaby's Cockatoo activity in the local area, the vegetation proposed to be cleared is not considered to form significant habitat for Carnaby's Cockatoo. It is also noted there are several large nature reserves in the study area that contains similar habitat, including Nature Reserve 18583, which contains at least 221 ha of eucalypt woodlands (Astron, 2020).

	The database search identified several historical observations of Malleefowl along this section of GEH, with the most recent record being an opportunistic sighting in 2010 (GIS Database). The majority of these records are located within or near Nature Reserve 16000. The Allocasuarina tall shrublands, Eucalypt woodlands and Mixed shrublands habitat types are considered suitable for this species. There was no evidence of breeding recorded at the time of the fauna survey, and subsequent inspections by Main Roads during project development has not identified any recent breeding activity within the proposal area or adjacent in vegetation. While the biological survey (GHD, 2016) indicated there was potential for Malleefowl to utilise the habitat within the proposal area for breeding, the likelihood of this is considered to be very low given: • no evidence of breeding activity (i.e. mounds) was recorded during the biological survey and a subsequent site inspections by Main Roads; • clearing comprises a relatively thin strip of vegetation along either side of the GEH where noise and vibration effects would deter breeding activity; • feral predators such as the red fox and cat occur in the proposal area; • vegetation with similar habitat value occurs in the local area. Chuditch can occur in the Goldfields and Wheatbelt, albeit in lower densities (DEC, 2012). There was no evidence of this species within the proposal area at the time of the survey (GHD, 2016) and the species has not been previously recorded in the study area (the nearest record is approximately 35 km west). Chuditch may utilise the habitat types present within the project area, however given the linear nature of the clearing, the habitat present likely forms a small part of any individual's home range. There are large areas of remnant vegetation in the local area that will provide higher quality habitat, including Nature Reserve 16000, which directly adjoins the proposal area, and various patches of native vegetation in close proximity to GEH. For Shield-backed Trapdoor Spider in the Wheatbelt, habitat critical to the species is identified as open York gum (*Eucalyptus loxophleba*), Salmon gum (*E. salmonophloia*) and Wheatbelt Wandoo (*E. capillosa*) woodland, where Jam (*Acacia acuminata*) forms a sparse understorey in heavy clay soils (ACC, 2007a). The proposal area may contain suitable habitat in the form of vegetation type VT01, described as *Eucalyptus loxophleba* subsp. *lissophloia* open mallee forest over an understory comprising *Acacia acuminata* (GHD, 2016), although this vegetation type was not noted as containing heavy clay soils. VT01 only forms a small part of the proposal area (1.32 ha). More broadly, the Eucalypt woodlands habitat type (which comprises vegetation types VT01, VT04, VT05, VT09 and VT10) may provide suitable habitat for this species. The proposal area contains 9.19 ha of this habitat type, which is restricted to the vegetation directly adjacent to GEH. It is noted from the biological survey that there is approximately 45 ha of similar Eucalypt woodlands habitat within the survey area (Figure 4 and Figure 5). Therefore, significant impacts to this species or habitats are not expected. The Tree-stem trapdoor spider typically occupies flood-prone depressions and flats that support myrtaceous shrub communities, in particular those areas supporting Broombush (*Melaleuca uncinata*) and Sheoaks (such as *Allocasuarina acutivalvis*) in sandy loam soils (ACC, 2007b). The proposal area may provide suitable habitat in the form of Mixed shrublands and *Allocasaurina* tall shrublands, of which 9.88 ha occurs in the proposal area. Over 50 ha of Mixed shrublands and *Allocasaurina* tall shrublands have been mapped within 60 m of this section of GEH. The proposal area is also adjacent to several large patches of remnant vegetation, including Reserve 16000. Habitat for this species is therefore not restricted to the proposal area.

	Peregrine Falcon and Fork-tailed Swift are highly mobile species with wide distributions and would not be reliant on vegetation in the proposal area for habitat. While the proposal area may provide some habitat value for fauna, including for conservation significant species, given the linear nature of the clearing and extent of native vegetation adjacent to the proposal area, the proposed clearing is not likely to form significant habitat for fauna. Based on the above, the proposed clearing is not likely to be at variance to this principle.
Methodology	ACC (2007a) ACC (2007b) Astron (2020) DAWE (2020) DBCA (2020) Department of Environment and Conservation (2012) DSWEWPaC (2012) EPA (2019) GHD (2016)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments	**Proposal is not likely to be at variance to this Principle**
	A desktop search identified five Threatened flora species that are known to occur in the study area, with an additional seven species potentially occurring in the study area (DAWE, 2020; GIS Database). No historical records of Threatened flora have been previously recorded in the proposal area. Ecologia (2019) conducted a likelihood of occurrence assessment of Threatened flora and identified the following four flora species as having the potential to occur in the proposal area due to the availability of suitable habitat: • *Boronia adamsiana;* • *Eremophila resinosa;* • *Eremophila viscida;* • *Gastrolobium diabolophyllum.* A targeted flora survey conducted in the proposal area did not record these species, or any other Threatened flora occurring in the proposal area (Ecologia, 2020). Based on the above, the proposed clearing is not likely to be at variance to this principle.
Methodology	DAWE (2020) Ecologia (2019) GIS Database: - Threatened and Priority (DBCA) - Threatened and Priority (WA Herbarium)

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments	Proposed clearing is not at variance to this Principle
	According to available databases, no TECs listed under the BC Act are known to occur within the proposal area (GIS Database). None of the vegetation types recorded in the proposal area represent a state listed TEC (GHD, 2016). Based on the above, the proposed clearing is not at variance to this Principle.
Methodology	GHD (2016) GIS Database: - Threatened and Priority Ecological Communities (Buffered)

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments	Proposed clearing is at variance to this Principle
	The proposal is located in the Avon Wheatbelt IBRA region, of which approximately 19% of pre-European vegetation extent remains (Government of Western Australia, 2019). At a local scale, approximately 18% of remnant vegetation remains in the study area (20 km) (GIS Database). The vegetation of the proposal area has been broadly mapped as the following pre-European vegetation associations: **8:** Medium woodland; salmon gum and gimlet. **36:** Shrublands; thicket, *Acacia-Casuarina* alliance. **536:** Medium woodland; morrell & rough fruited mallee (*Eucalyptus corrugata*). **1413:** Medium open woodland; Eucalypts over teatree. The National Objectives and Targets for Biodiversity Conservation recognise that the retention of 30 per cent or more of the pre-clearing extent of each ecological community is necessary if Australia's biological diversity is to be protected (Commonwealth of Australia, 2001). With regard to the four broad vegetation associations mapped within the proposal area, vegetation associations 536 and 1413 retain over 30% at all scales. Vegetation associations 8 and 36 retain over 30% of pre-European vegetation at the state and local government scale but less than 30% in the Avon Wheatbelt IBRA region and Merredin subregion (see Table 4). With regard to vegetation association 8, there is approximately 5,216 ha of this vegetation association remaining in the surrounding 20 km according to remnant vegetation mapping (GIS Database). Eucalypt woodland vegetation types within the mapped extent of vegetation association 8 accounts for 6.02 ha of vegetation in the proposal area. This represents approximately 0.01% of the remaining extent of vegetation association 8 in the Avon Wheatbelt IBRA bioregion and Merredin subregion, and 0.1% of the remaining extent in the study area. With regard to vegetation association 36, there is approximately 9,677 ha of this vegetation association remaining in the surrounding 20 km. Shrubland vegetation types comprising the characteristic species of *Acacia*, *Casuarina*, *Allocasuarina* and *Melaleuca* within the mapped extent of vegetation association 36 accounts for 7.01 ha of vegetation

	in the proposal area. This represents approximately 0.01% of the remaining extent of vegetation association 36 in the Avon Wheatbelt IBRA bioregion and Merredin subregion, and 0.07% of the remaining extent in the study area. This section of GEH is located in an approximately 100 metre wide corridor of vegetation, which is associated with vacant crown land and redundant or undeveloped road reserves. GEH is situated towards the north of this corridor. Consequently, a wide corridor of higher quality vegetation will be retained following clearing. Aerial imagery indicates there are also large remnant patches of native vegetation adjacent to the proposal area, including Nature Reserve 16000, vegetation south-west of Bodallin, and vegetation south of GEH between SLK 325 and 327. The proposed clearing is linear in nature and will result in the removal of thin strips of vegetation either side of GEH. As such, the proposed clearing will not significantly diminish any vegetation corridors or linkages between larger patches of native vegetation across the landscape. As the vegetation comprises underrepresented vegetation associations in an extensively cleared landscape and a significant ecological community, the propose clearing is considered at variance to this principle.
Methodology	Commonwealth of Australia (2001) Government of Western Australia (2019) GIS Database: - Aerial imagery - DAFWA Remnant Vegetation - DBCA Managed Lands - Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments	**Proposed clearing is at variance to this Principle**
	Four minor non-perennial watercourses intersect the proposal area (GIS Database). These watercourses are only expected to flow following significant rainfall events. Although no vegetation within the proposal area has been mapped as riparian (GHD, 2016), it is considered the proposal area contains a small area (~0.02 ha) of vegetation growing in association with a watercourse. The area proposed to be cleared is minor in scale and nature, with the clearing proposed not expected to impact the values of these watercourses. There are no wetlands in the vicinity of the proposal area. Based on the above, the proposed clearing is at variance to this principle.
Methodology	GHD (2016) GIS Database - Hydology South

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments	Proposed clearing is not likely to be at variance to this Principle
	Topography ranges from 370 to 410 m ADH, across an approximately 15 km proposal area. Travelling east, the proposal area gently slopes down into a slight valley, then increases in elevation towards the eastern extent of the proposal area (GIS Database). The project is located in the Northern Zone of Ancient Drainage of the Avon Soil-Landscape Province (GHD, 2016), which is characterised by gently undulating terrain. A variety of soils have been recorded in the proposal area, including sandplains, sandy loams, loams and loam clays (GHD, 2016). Natural Resource Management Soil Systems and CSIRO Acid Sulphate Soils risk mapping indicates the soils of the proposal area have generally low risk of land degradation, with a moderate risk of wind erosion (GIS Database). Given the linear nature of the clearing and sealing of areas for road construction, the proposed clearing is not likely to lead to an appreciable increase in land degradation. Standard erosion and dust management control measures will be implemented during construction to reduce the incidence of wind erosion. Based on the above, the proposed clearing is not likely to be at variance to this principle.
Methodology	GHD (2016) GIS Database: - Contours – WB North 25k-100k - CSIRO Acid Sulphate Soils risk mapping - Nature Resource Management SLIP soil systems

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments	Proposed clearing is at variance to this Principle
	The proposal area intersects unnamed class-C nature reserve R 16000, which is vested in the Conservation and Parks Commission of WA for the purpose of conservation of flora and fauna. The reserve is approximately 1,713 ha in area, and is managed by the Department of Biodiversity, Conservation and Attractions (DBCA). The proposal area is marginally wider than the current road reserve to facilitate the widening of GEH. Main Roads has initiated the transfer of land from the nature reserve into road reserve, which will result in widening the road reserve by 20 m either side of the current cadastral boundary. This transfer will be finalised prior to construction and will also address the misalignment of the cadstral boundary with respect to the constructed alignment of GEH.

	As part of the land trasfer, Main Roads has also identified areas of mixed tenure adjacent to R 16000, such as Unallocated Crown Land (UCL) and redundant road reserve, to transfer into the conservation estate. The inclusion of this land will result in a net gain in conservation area. DBCA and the Conservation and Parks Commission of WA have endorsed the proposed land transfer (see Appendix 2). The proposed clearing will occur following the land transfer, therefore an approval under DBCA's Disturbance Approvals System is not required. The proposal area covers a 5.18 ha area of Nature Reserve R 16000, which includes 1.76 ha of native vegetation and 3.42 ha of cleared or highly disturbed areas associated with the cleared GEH corridor. The vegetation does not contain any significant flora or fauna, but does interesect a patch of Euclaypt Woodlands TEC/PEC (~0.06 ha). The Astron (2018) TEC assessment and extrapolation of aerial imagery indicates this patch extends approximately 400 m beyond the proposal area into Nature Reserve R 16000 (Appendix 1; Figure 5). Taking into consideration the proposed clearing area accounts for less than 1% of Nature Reserve R 16000, and the affected land will transfer into the GEH road reserve, the proposed clearing is unlikely to significantly impact on the environmental values of this reserve. The implementation of a Construction Environmental Management Plan (CEMP) will manage indirect impacts to the reserve. The CEMP will include management controls to prevent the introduction and spread of weeds, manage of hydrocarbons, prevent soil erosion and ensure clearing is contained in the approved area. The proposed clearing is linear in nature, and will only affect a thin strip of vegetation along the edge of the nature reserve. As such, the proposed clearing will not impact on any linkages between Nature Reserve R 16000 and other reserves or patches of remnant vegetation in the local area. Based on the above, the proposed clearing is not likely to be at variance to this principle.
Methodology	Astron (2018) GIS Database: - DBCA Managed Lands

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments	**Proposed clearing is not likely to be at variance to this Principle**
	Numerous minor non-perennial watercourses are located in the study area, including four minor drainage lines that intersect the proposal area. The proposed clearing will only impact a very small area at each watercourse as part of works to upgrade the existing culverts. These activities are not expected to impact on surface water flows or quality. The proposal area does not occur within a Public Drinking Water Source Area (GIS Database). The proposed linear clearing of 17 ha of native vegetation along an existing major road is not likely to alter groundwater quality in the area. Based on the above, the proposed clearing is not likely to be at variance to this principle.

Methodology	GIS Database: - Hydrology South - PDWSAs

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments	**Proposed clearing is not likely to be at variance to this Principle**
	The proposal area is situated in the Swan Avon – Yilgarn Catchment, which drains an area of approximately 58,360 km^2. The proposal area averages 320 mm of rainfall annually (BOM, 2020). The topography across the proposal area is gently undulating, with a slight decrease in elevation towards the centre of the proposal area. The soils of the proposal area have a low risk of waterlogging and flooding (GIS Database). Four minor non-perennial watercourses intersect the proposal area. Clearing at these locations will be for the upgrade of existing culverts, thereby maintaining the existing flow of the watercourse. The minor and linear nature of the clearing is unlikely to result in excessive levels of surface runoff that would increase the intensity or incidence of flooding. Based on the above, the proposed clearing is not likely to be at variance to this principle.
Methodology	BOM (2020) GIS Database: - DoW Catchment - Hydrology South - Natural Resource Management SLIP soil systems

6 ADDITIONAL ACTIONS REQUIRED

Table 5 summarises what further pre-clearing impact assessment and vegetation management is required in accordance with CPS 818.

Table 5: Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	*Further Action Required*
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles. Where the clearing is at variance or may be at variance to Clearing Principle (f) and no other Clearing Principle, and the area of the proposed clearing is less than 0.5 hectares in size and the Clearing Principle (f) impacts only relate to: (i) a minor non-perennial watercourse(s); (ii) a wetland(s) classed as a multiple use management category wetland(s); and/or (iii) a wetland that is not a defined wetland; the preparation of an Assessment Report, as required by condition 6(e), is not required.	**Yes**	**1.** Submissions will be sought from relevant parties, including the LGA, in accordance with Condition 8 of CPS 818/15 published on the website. **2.** VMP has been completed, refer to Appendix 3. **3.** An offset proposal for approval by DWER is required where clearing is 'at variance'. The offset proposal must be approved prior to undertaking clearing of the area to which the offset is related.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.	**No**	No further action required.
3. The project involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
4 a. Project is within Region that: - Has rainfall greater than 400mm and - Is South of the 26th parallel and - Works are in 'Other than dry conditions' and - Works have potential for **uninfested** areas to be impacted	**No**	Proceed with standard Vehicle and Plant management actions from PEMR's and Vehicle and Plant Hygiene Checklists

Impact of Clearing	Yes/No or NA	*Further Action Required*
4b. Does the proposed works require clearing within or adjacent to DBCA estate in non-dry conditions?	**No**	No further action required.
5. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback	**No**	No further action required.
6. The vegetation within the area to be cleared and/or the surrounding vegetation in a good or better condition and weeds likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition	**No**	No further action required. The proposal includes implementation of a CEMP, which will prevent the spread of weeds to adjacent areas of native vegetation.

7 STAKEHOLDER CONSULTATION

Main Roads will undertake stakeholder consultation in accordance with CPS 818/15 Condition 8.

The CAR will be updated with the stakeholder submissions received and Main Roads responses to any key issued raised.

Table 6 provides a summary of stakeholder consultation undertaken to date.

Table 6: Stakeholder Consultation

Stakeholder	Date	Comments
Greg Durell – DBCA Regional Manager Wheatbelt	27/03/2019	Discussed the larger Walgoolan to Southern Cross upgrades and land requirements.
Nicola Mincham – DBCA Land Unit Coordinator	2018 - ongoing	MRWA has worked closely with DBCA Land Services to facilitate the transfer of tenure. Approximately 20 m either side of the GEH road reserve will be transferred from Nature Reserve into road reserve to accommodate widening GEH. The Conservation and Parks Commission of WA has endorsed this.
DWER Drainage and Waterways Branch	11/02/2021	No comments received.
Greg Durell - DBCA Regional Manager Wheatbelt	11/02/2021	No comments received.
Shire of Yilgarn	11/02/2021	No comments received.
Eddy Wajon – Wildflower Society	11/02/2021	One submission was received via the Main Roads website portal (dated 4 March 2021). Response to submission is provided in Appendix 4.
DWER Native Vegetation Clearing Branch	11/02/2021	DWER have raised some of the following broad issues concerning the Proposal: - Inclusion of daily pre-start meetings - Provision of maps to contractors that delineates Wheatbelt TEC - pre-clearing fauna survey targeting *Idiosoma nigrum* and *I. macnamarai* individuals (including burrows) within and adjacent to the proposal area DWER advised that clearing was at variance with clearing principle (h). Main Roads has continued to liaise with DWER to resolve the broad issues. This document (including the VMP) has been updated to reflect any changes. This CAR/VMP has been approved by DWER on 30/03/2021.

8 VEGETATION MANAGEMENT

Main Roads will avoid clearing native vegetation where possible. Where clearing cannot be avoided then this clearing is kept to a minimum. A Vegetation Management Plan (VMP) has been developed to manage and minimise vegetation clearing for the project (refer to Appendix C).

9 REFERENCES

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Environmental Protection Authority (2016) Technical Guide – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (eds. K Freeman, G Stack, S Thomas and N Woolfrey). Perth, Western Australia.

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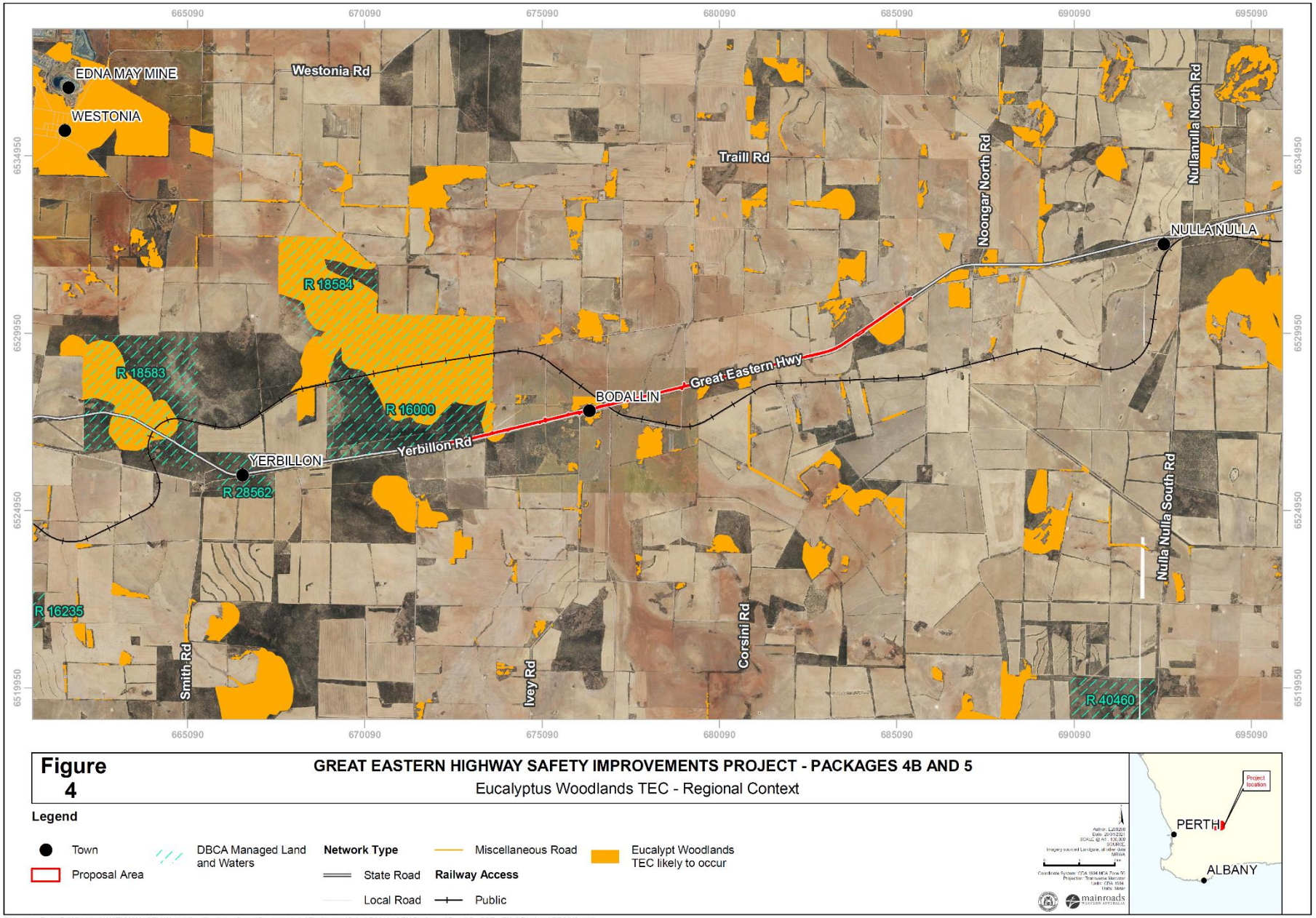
Government of Western Australia (2014) WA Environmental Offset Guidelines. Perth, Western Australia.

Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017. WA Department of Biodiversity, Conservation and Attractions, Perth. Available online from: https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics.

10 APPENDICES

Appendix	Title
Appendix 1	Figure of Eucalypt Woodlands TEC
Appendix 2	Endorsement of Land Transfer from Nature Reserve R 16000
Appendix 3	Vegetation Management Plan
Appendix 4	Response to Submissions

Appendix 1: Eucalypt Woodlands TEC in Local Area



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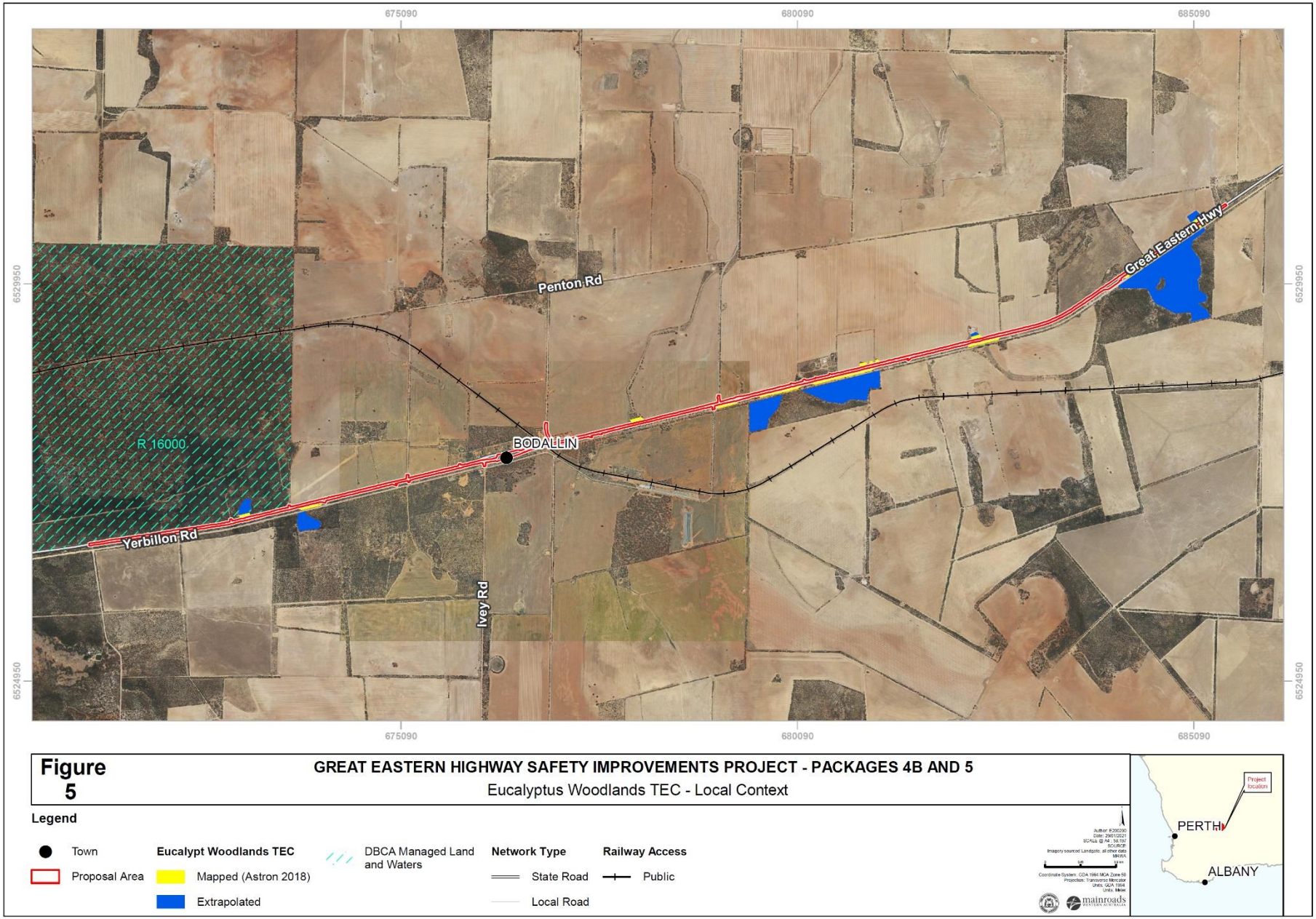

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Appendix 2: Endorsement of Land Transfer from Nature Reserve 16000

PROPOSED EXCISION FROM UN-NAMED NATURE RESERVES 18583 AND 16000 TO FACILITATE UPGRADES TO GREAT EASTERN HIGHWAY

That the Conservation and Parks Commission endorses the proposed excision of approximately 14.32 hectares from Un-named Nature Reserve 18583 and approximately 9.47 hectares from Un-named Nature Reserve 16000, shown on Main Roads Land Dealing Plans 1960-040 to 1960-044 14 to facilitate upgrades to the Great Eastern Highway.

☑ **ENDORSED**

☐ **NOT ENDORSED**

Christopher Dwyer 19/07/2019

CONSERVATION AND PARKS COMMISSION

Appendix 3: Vegetation Management Plan

GREAT EASTERN HWY UPGRADE PACKAGES 4B AND 5 (SLK 311.8 – 327)

Purpose and Scope

This Vegetation Management Plan (VMP) has been prepared by Main Roads for the purpose of managing native vegetation clearing impacts associated with the project.

Main Roads proposes to upgrade a 15 km section of GEH near the townsite of Bodallin. The project comprises the following components:

- 15.2 km of road reconstruction and widening to achieve an 11 m wide seal on an 11 m wide formation;
- Slight realignment of GEH through the townsite of Bodallin;
- New east-bound passing lane;
- Upgrade a westbound parking bay;
- Improvements to private property access;
- Improvements to intersections with local roads;
- Upgrade drainage infrastructure.

In specified circumstances, Main Roads VMP is required to be approved by Department of Water and Environmental Regulation (DWER) as a condition of Main Roads Statewide Clearing Permit CPS 818.

Action

Appendix 3.1 references the standard Principal Environmental Management Requirements (PEMRs) that will be utilised for all projects that involve clearing to avoid, mitigate and manage the environmental impacts of the project.

Project Specific Environmental Management Requirements are contained in Table 1.

Timeframes

Actions shall be undertaken in accordance with those described in the relevant PEMR and the Project Specific Environmental Management Requirements.

Responsibilities

It is the responsibility of the Superintendent's Contract Management Team to ensure that the requirements are implemented by the Contractor. This shall be done by adhering to the Environmental Measurement and Evaluation Checklist.

Appendix 3.1: Vegetation Management

VMP Requirement	Standard Management Action	Specific Management Action
Clearing	Refer to Table 1: Clearing PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan • Specification 301 Vegetation Clearing and Demolition • Environment Measurement and Evaluation Checklist (for release of HOLD POINTS) Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	
Erosion and Sedimentation Control	Refer to Table 2: Erosion and Sedimentation Control PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	
Fauna	Refer to Table 3: Fauna PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	1. Conduct a pre-clearing fauna survey targeting *Idiosoma nigrum* individuals (including burrows) within and adjacent to the proposal area. The survey findings will be communicated to the Department of Water and Environmental Regulation (DWER). 2. Conduct clearing works in a manner that ensures no direct or indirect impacts to the areas where the known *I. nigrum* burrows are found within close proximity of the clearing 3. Any burrows identified in the direct impact of the clearing works or that are likely to be unavoidably indirectly impacted by clearing activities will be checked for occupants

VMP Requirement	Standard Management Action	Specific Management Action
		4. A Ministerial Authorisation to take threatened fauna under section 40 of the Biodiversity Conservation Act 2016 will be obtained prior to disturbing any known *I. nigrum* individuals. Where the burrows cannot be avoided and is occupied by a resident spider, it will be collected and lodged with the WA Museum and/or in accordance with the authoirsation to take
Machinery and Vehicle Management	Refer to Table 4: Machinery and Vehicle Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	
Mulch and Topsoil Management	Refer to Table 5: Mulch and Topsoil Management • Specification 204 Environmental Management • Construction Environmental Management Plan • Specification 301 Vegetation Clearing • Specification 304 Revegetation and Landscaping Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	
Pegging and Flagging	Refer to Table 6: Pegging and Flagging PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan • Specification 301 Vegetation Clearing and Demolition Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	1. Prior to construction, a qualified surveyor will clearly and accurately demarcate the limits of vegetation clearing 2. Areas where the patches of the Wheatbelt Woodland TEC/PEC occur will be pegged at 10 m intervals and exclusion zones will be demarcated using appropriate flagging.

VMP Requirement	Standard Management Action	Specific Management Action
Water Drainage Management	Refer to Table 7: Water Drainage PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan	
Weed Management	Refer to Table 8: Weed Management PEMR • Specification 204 Environmental Management • Construction Environmental Management Plan Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	
Monitoring	• Specification 204 Environmental Management • Construction Environmental Management Plan • Superintendent's Contract Management Plan & Environmental Measurement and Evaluation Checklist. Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	•
Auditing	• Specification 204 Environmental Management • Superintendent's Contract Management Plan & Environmental Measurement and Evaluation Checklist. Contract Tender Documents available at https://www.mainroads.wa.gov.au/technical-commercial/tender-preparation/	•

Principal Environmental Management Requirements (PEMR's)

Table 1: Clearing PEMR

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must prepare, implement and maintain processes to ensure that the movement of all vehicles, plant and machinery does not occur outside of the Limits of Vegetation Clearing. This must include all turnaround areas. 2. The Contractor must minimise vegetation clearing and the area of disturbance on ground by utilising existing cleared area where possible.
DURING WORKS 1. The Contractor must report any damage to vegetation beyond the Limits of Vegetation Clearing as an Environment Incident. 2. The Contractor must ensure Movements are confined to the Limits of Vegetation Clearing during the works 3. The Contractor must undertake the clearing in accordance with the Fauna PEMR.
POST WORKS 1. NIL

Table 2: Erosion and Sedimentation

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must develop, implement and maintain processes and procedures to ensure that: • The Contractor is responsive to and addresses incidents of erosion and sedimentation within and adjacent to the work areas. • Prevent water and wind soil erosion within and adjacent to the works areas. • Prevent the sedimentation and siltation of watercourses located within and adjacent to the works area. • Ensure that sedimentation and siltation of drainage lines due to the removal of riparian vegetation is avoided, minimised and mitigated. • Ensure that loose surfaces and recently cleared areas are protected from wind and soil erosion. • Minimise exposed soil working surfaces or protect them from stormwater erosion. • Ensure material such as gravel, crushed rock and excavated material is stockpiled away from drainage paths and covered to prevent erosion. • Ensure that water quality monitoring is undertaken when turbidity and sedimentation is an issue.
DURING WORKS 1. Implement, monitor and adhere to the sedimentation and erosion processes developed to address the requirements in the pre-works.
POST WORKS 1. If required, the Contractor must continue to monitor water quality until the turbidity/sedimentation dissipates. 2. The Contractor must ensure that disturbed areas are stabilised as soon as is practicable after construction activities are completed.

Table 3: Fauna

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must ensure that fauna management requirements are communicated to the crew undertaking the clearing works during the induction and pre-start meeting. 2. Where active nests, burrows or dens are identified, works must not proceed until the Contractor obtains the Superintendents approval of the management of active nests, burrows or dens adheres to the Superintendents advice.
DURING WORKS 1. The Contractor must undertake the clearing in the following manner to allow fauna to move out of the clearing area; i. Prior to the clearing activities commencing, use machinery to tap large trees with habitat hollows to encourage any animals evacuate. ii. Undertake the clearing in one direction and towards areas of native vegetation to allow the animals to escape to adjacent habitat. 2. The Contractor must ensure that all onsite personnel undertake visual monitoring and are vigilant to the presence of fauna. Any sightings of fauna, including injury or fatality, must be reported as an Environmental Incident. 3. The Contractor must ensure that; i. No pets, traps or firearms are brought into the project area. ii. Fauna are not fed iii. Fauna are not intentionally harmed or killed iv. Fauna that venture into the work area are encouraged to leave in a manner that does not harm the animal or operator (loud noise, slowly approaching in a vehicle etc.) 4. The Contractor must ensure that in the event that sick, injured or orphaned native wildlife are located on the project site, the WILDCARE Helpline ((08) 9474 9055) will be contacted for assistance. The Contractor must maintain records of any animal taken to a wildlife carer.
POST WORKS 1. The Contractor must provide any records of fauna impact to the Superintendent.

Table 4: Machinery and Vehicle Management

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must ensure that all areas associated with the storage, parking, servicing, wash down and refuelling of all vehicles, plant and machinery is located within the Limits of Clearing and approved by the Superintendent. 2. The Contractor must ensure that all vehicles, machinery and plant are clean on entry (i.e. free of all soil and vegetation material) and comply with the requirements of 204.B.32. 3. The Contractor must ensure that vehicle servicing and refuelling will be undertaken at designated areas approved by the Superintendent. 4. The Contractor must ensure that all staff suitably qualified and competent to undertake works, especially refuelling activities.
DURING WORKS 1. The Contractor must maintain records of checking all vehicles, machinery and plant are clean on entry.
POST WORKS

Table 5: Mulch and Topsoil Management

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must ensure that the movement of soil and vegetation is only undertaken in dry conditions unless otherwise approved and / or directed by the Superintendent. 2. The Contractor must ensure that poor quality topsoil and mulched vegetation does not contaminate the good quality topsoil and vegetation.
DURING WORKS 1. The Contractor must ensure that all machinery used in the removal of weed-infested topsoil must be cleaned down before and between operations to prevent the introduction and spread of weeds. 2. The Contractor must ensure the movement of large equipment over topsoil materials is avoided to minimise compaction. 3. The Contractor must ensure that Dieback and weed infected topsoil and mulch vegetation must be handled separately to minimise the risk of spreading dieback and weed species across the site and stockpiles. 4. The Contractor must ensure that stockpiling operations must occur in a manner to ensure that the properties of the topsoil are not degraded and the topsoil made unsuitable for use in revegetation.
POST WORKS Nil

Table 6: Pegging and Flagging

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. Pegging must be done in accordance with the requirements detailed in Specification 301. 2. The Contractor must clearly communicate, either at the pre-start meeting or equivalent, to the crew undertaking the clearing works, through clear maps and other additional means, what the Pegging represents.
DURING WORKS 1. The Contractor must peg the Limits of Clearing by PINK flagging tape. 2. The Contractor peg/demarcate vegetation proposed to be retained is demarcated by WHITE flagging tape. 3. The Contractor must ensure that the vegetation demarcated with PINK and WHITE flagging tape is consistent with the approved clearing areas.
POST WORKS 1. The Contractor remove and dispose of appropriately any demarcation, pegging or flagging once project works are completed.

Table 7: Water Drainage

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. Use pollution control and containment strategies for project activities in Public Drinking Water Source Areas (PDWSAs) / Underground Water Pollution Control Areas (UWPCAs) and liaise with the DWER where necessary
DURING WORKS 1. Existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted. 2. Temporary drainage systems may be installed to carry surface water away from the areas where excavation and foundation construction work is taking place or from any other area where the accumulation of water could cause delay or damage to the work. 3. Maintain these drainage systems in proper working order at all times. 4. Runoff from disturbed areas must be managed to minimise adverse impacts on surrounding vegetation, watercourses and properties. 5. Booms and silt fences must be used when working over or adjacent to areas of surface water in order to protect the quality of surface water from construction impacts.
POST WORKS 1. Water quality monitoring to be undertaken (if turbidity/ sedimentation is an issue). 2. Prior to backfilling the completed pipe work certify that the entire system is flushed clean and tested 3. Disturbed areas will be stabilised soon after construction activities are completed. 4. Culvert and drainage structures will be free of all grass, weeds, silt and debris

Table 8: Weed Management

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must remove or kill any weeds growing in project area that are likely to spread and result in environmental harm to adjacent areas of native vegetation that are in good or better condition. 2. The Contractor must develop, implement and maintain procedures to identify and control declared and invasive weed species within the Contract areas, to the satisfaction of the Superintendent. 3. The Contractor must prepare a weed control program, for nominated weed species for control and disposal, to the satisfaction of the Superintendent. 4. The Contractor must undertake weed management in Stockpiles as directed by the Superintendent.
DURING WORKS 1. The Contractor must implement the weed control procedures and management plan and record and manage records of its implementation. 2. The Contractor must treat nominated weed infestations as many times as necessary to control and eradicate the weed species in accordance with the approved weed control program 3. The contractor must ensure that no known weed, pest or diseased affected soil, mulch, fill or other material is brought into the Site.
POST WORKS 1. The relevant Vegetation Maintenance Record Sheets available at: https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/Pages/ReportingForms.aspx must be completed and sent to the Superintendent.

Appendix 4: Response to Submissions

Submission (Wildflower Society; Website Submission dated 4 March 2021)	Main Road Response
The Wildflower Society of Western Australia (WSWA) is unable to assess this document due to the lack of basic information regarding the scope and scale of the project. The mapping did not allow the width of the elements of the road structure to be determined to determine if the road design could be refined to avoid and minimise the extent of clearing required.	The information for the Proposal and supporting documentation provided in the Clearing Assessment Report (CAR) is adequate and fulfils the requirements outlined under CPS 818. Main Roads will aim to provide additional information on the scope and scale of Proposal, noting that the clearing footprint outlined in the CAR is typically based on a conceptual design (15% design), at the early stages of development, and is continually being refined to reduce impacts on the environment. Proposal amendments Main Roads has made to avoid, minimise and reduce its impacts are detailed in the CAR that was made available on its website for submissions and included: • removal of a westbound overtaking lane from the proposal. This section of Great Eastern Highway (GEH) was considered strategically well positioned for a westbound overtaking lane given the proximity to other over-taking opportunities. However, widening GEH at this location to include an overtaking lane would have resulted in a larger area of clearing, including clearing in a Threatened Ecological Community (TEC). The overtaking lane was relocated to another package of work approximately 15 km west, thereby reducing clearing by approximately 1.3 ha. The design has been simplified by reducing excessive turning pockets and reducing earthworks by utilising existing ground levels where possible. • Widening will be towards the northern side of the existing alignment, thereby reducing clearing in relatively better quality vegetation along the southern side of GEH. • Widening to utilise the existing cleared areas adjacent to the road, with only minor clearing required to achieve the full design width. This section of GEH requires a westbound parking bay. Main Roads will upgrade an old existing parking bay that exists within the proposal area instead of constructing a new bay. • Access tracks will not be required. Half width construction methodology will be followed and traffic will be managed through the existing alignment. If side tracks are required for traffic managed, the location will be limited to existing cleared areas. During construction, temporary ancillary activities such as site offices, storage areas, laydown areas and stockpiles will be restricted to previously cleared areas.
The summary of the flora and fauna surveys does not allow to examine the methodology and effort used in the	In accordance with CPS 818/15, Main Roads provided a summary of the flora and fauna surveys that were undertaken to inform the assessment. A summary is provided to ensure sensitive information

Submission (Wildflower Society; Website Submission dated 4 March 2021)	Main Road Response
surveys or to be able to examine the extent of the vegetation associations influenced by the project.	(such as localities of threatened species) is not unknowingly released, especially given the heightened transparency the Main Roads website provides. The surveys completed for the proposal were undertaken by highly regarded botanists and environmental scientists, with the methodology and survey effort reviewed by internal technical experts. Final versions of the biological reports are provided to Department of Water and Environmental Regulation (DWER) as part of its assessment of the CAR. The extent of vegetation associations within the proposal area (or other locations in Western Australia) has been provided in the CAR, and are also publicly available on the Department of Primary Industries and Regional Development (DPIRD) NRInfo interactive mapping system and available for download as a shapefile at data.wa.gov.au. The vegetation associations within the proposal area, including proposed impacts to these associations are detailed in Section 4.1.1, and presented in Table 3 and Table 4.
The assessment of clearing principles is technically correct, but the assessment of two of the principles and represents "poor practice". Impacts to Commonwealth-listed TECs should be assessed under clearing principle d with State-listed TECs.	Main Roads will continue to assess the clearing principles in the same manner as DWER and in accordance with the relevant legislation and regulation. According to the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, a threatened ecological community is defined as "an ecological community that (a) has been determined by the Minister to be a threatened ecological community; and (b) is referred to in the list of threatened ecological communities maintained by the chief executive officer of the department of the Public Service principally assisting in the administration of the *Conservation and Land Management Act 1984*." Accordingly, only State listed TECs are discussed under Clearing Principle (d). Where Commonwealth listed TECs are impacted, clearing principle (a) is likely to be triggered.

Submission (Wildflower Society; Website Submission dated 4 March 2021)	Main Road Response
The impact on nearby conservation areas is considered in the Assessment Report as if proposed land tenure transfers of parts of Nature Reserve R 16000 to the road reserve have already been made.	The transfer process has commenced with DBCA for a narrow strip of land to be part of the road reserve. The proposed clearing will only occur within Main Roads road reserve once land acquisitions with DBCA have been completed. As such, the proposed clearing will not be at variance with clearing principle (h) given, technically, the area will be road reserve and the clearing of a narrow strip of vegetation typically less than 5 m wide is not contrary to the intention of this principle, which relates to identifying clearing that may impact on the ecological functions and processes of a conservation reserve. Clearing for the proposal will not reduce the environmental values of the adjacent conservation areas. The proposed clearing will be occurring in Main Roads reserve and will not be located in conservation reserve. Accordingly, the proposal will not be at variance with clearing principle (h).
In the Assessment Report, details of the land transfer (amount, parcels, quality etc) are not given. The land transfer details should be provided so that an independent party can assess whether there will in fact be a net gain to the conservation reserve.	Section 5 of the CAR provides details of the unnamed class-C nature reserve R 16000, which is vested in the Conservation and Parks Commission of WA. The location of R16000, including its current boundary managed by DBCA, and the portion that lies within the proposal area, is presented in Figure 4 and Figure 5. Net gain results from potentially more land being transferred into conservation estate compared to that being removed. Main Roads is still in negotiations with DBCA on the location of land parcels being returned to conservation estate. Main Roads has consulted with DWER to determine a suitable offset for clearing impacts from the Proposal.
If the impacts on the Commonwealth-listed TEC were acknowledged then the offset triggered would require a like-for-like offset of that TEC, and that would affect the area calculated in the Commonwealth offset calculator.	The Wildflower Society's position is noted. Main Roads will continue to assess the clearing principles in the same manner as DWER and in accordance with the relevant legislation and regulation. If offsets are required for this proposal, the offset will be developed in accordance with the WA offset guidelines.

Submission (Wildflower Society; Website Submission dated 4 March 2021)	Main Road Response
Composition details of the offset are not specified, nor is the possibility that the offset may result in net loss of vegetation.	The offsets for this proposal had not been finalised when consultation with the Wildflower Society occurred. Main Roads has been consulting with DWER to determine a suitable offset for the clearing impacts from the Proposal.
The vegetation maps supplied were at a sufficient level of detail; however, the development envelope from the 2016 report appears as though it may not be what is currently proposed. *The Assessment Report states that the clearing envelope is mainly on the northern side of the road, whilst the 2016 maps show clearing on both sides. These inconsistencies make if difficult or impossible to independently assess the impact on the adjacent vegetation from the current proposal.*	As previously advised, road proposals are dynamic in nature depending on topography, site conditions, environmental and heritage values and tenure. For example, as mentioned previously, a passing lane was removed from this package due to the presence of the Eucalypt Woodlands TEC. The "*development envelope from the 2016 report*" is the area of survey and is not the boundary for the proposed Development Envelope required for the Proposal.