Impact Assessment of Clearing and Matters of NES report

Toodyay Road Widening SLK 12.75 to 40.3

December 2016

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Report Compilation and Review	**Name and Position**	**Document Revision**	**Date**
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Reviewer:	Julie Mahony Senior Environment Officer	Final	22 December 2016

CONTENTS

SUMMARY

Project Title: Toodyay Road Widening SLK 12.75 to SLK 40.30

Project location(s): Toodyay Road in the Shire of Toodyay.

Area proposed to be cleared: Total clearing for this project is 54.87 ha of native vegetation, in an envelope that is 158.32 ha in size.

The following terms have been applied to this report:

- Project area: the area to be cleared for the project. This is based on the design plus 3 m to allow for the movement of machinery during construction.
- Project envelope: 5 m has been applied to the project area to allow for minor changes to the design and batters between approvals and construction.
- Survey area: the area surveyed by AECOM Pty Ltd in 2015 and 2016.

Morangup intersection, from SLK 15.59 to 16.2 was completed in 2016 under CPS818 and is not the subject of this approval.

Project background and purpose

The Wheatbelt has been identified as having some of the most dangerous roads in Western Australia, with Toodyay Road recognised as one of the most dangerous roads in the Wheatbelt Region.

In the Wheatbelt Region, 144 people were killed and 836 people hospitalised over a period of 5 years (2011 to 2015). Of the 144 deaths, 54 (37.5%) involved hitting roadside vegetation (48 trees and 6 shrubs). The Wheatbelt has a fatal crash rate of 37 fatalities / 100,000 persons in the population, 5 times the State average and 8 times the National rate. With 3.2% of the population, the Wheatbelt contributes to only 2.0% of total recorded crashes in WA but 7.2% of serious crashes and 16.9% of all fatal crashes. A person is 8 times more likely to die if involved in an accident on a Wheatbelt road than the rest of WA.

Toodyay Road was ranked as the highest risk route in WA. The Wheatbelt section of Toodyay Road has a crash rate which is 5 times the State average (Road Safety Commission, 2015).

For the Wheatbelt section of Toodyay Road, a total of 50 crashes with 16 Killed or Seriously Injured (KSI) crashes were recorded over the last 5 years (2011 to 2015). The 16 KSI crashes included:

- 1 fatal and 1 serious injury crash with vehicles turning at intersections.
- 1 fatality resulting from falling from a vehicle in a collision between turning vehicles at an intersection.
- 2 fatal and 1 serious injury head on collisions.
- 9 serious injury run off road crashes and then hit object (70% hit a tree).
- 1 serious injury rear end crash.

Main Roads Wheatbelt Region is proposing to improve the safety of Toodyay Road as a result of these serious safety concerns. This project will involve the widening of a section of the road from approximately SLK 12 to SLK 40, with realignments to remove substandard curves that impair driver vision. The project will also include:

- passing lanes
- culvert extensions and additions
- intersection upgrades
- road realignments where required to provide passing opportunities, remove dangerous curves and improve sightline distances.

Bridges may also be converted to culverts, depending on funding.

Temporary clearing required: Nil.

Biological Surveys
The project was surveyed by AECOM Pty Ltd in spring 2015. This included a fauna assessment plus targeted survey for Black Cockatoos. Significant trees, foraging and roosting habitat were targeted as per the referral requirements for the Department of the Environment and Energy, detailed in *EPBC Act Referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo, Baudin's cockatoo and Forest red-tailed black cockatoo.* A flora assessment was also undertaken by AECOM to identify threatened and priority flora species, vegetation type and condition and ecological communities.

The initial spring survey area included Toodyay Road for both Wheatbelt and Metropolitan regions. Subsequent surveys are only for the Wheatbelt region. Metropolitan region projects are not the subject of this report.

After liaising with the Department of Parks and Wildlife, an additional survey was undertaken in February 2016 for the Wheatbelt section of Toodyay Road. This was to survey areas that were added to the project after the 2015 survey, and to provide additional data as per Department of Parks and Wildlife requirements regarding rare and priority flora. Additional data provided included the exact population counts of priority flora in the project area, as well as clarification on the absence or presence of the Threatened Ecological Community Woodlands of the Wheatbelt, which was listed in late 2015.

Due to an extremely dry summer, the February 2016 survey data was not robust. An additional spring survey was then commissioned for 2016, to provide more robust flora population counts, survey additional areas added to the project design since February 2016, and address habitat data for Red-tailed Black Cockatoos that was missing from the original report.

Main Roads also commissioned a Chuditch targeted survey for spring 2016 to determine the presence and value of the project area to this species.

Project Approvals
The project was referred to the Department of the Environment in early 2016, and was deemed a 'Controlled Action'. Under the new assessment bilateral agreement, the Department of Environment Regulation will assess the impacts of the proposal on matters of national environmental significance and the clearing of native vegetation. Copies of correspondence from Department of the Environment and Energy is provided in Appendix D.

The project will cross a number of tributaries of the Swan River, and a Bed and Banks permit has been obtained under the *Rights in Water and Irrigation Act* 1914. The project will also require a Section 18 approval under the *Aboriginal Heritage Act* 1972 for proposed disturbance to Aboriginal Heritage sites.

Consultation
Main Roads invited submissions from specified stakeholders in February and May 2016; these are included in Appendix C.

The project was surveyed for both Aboriginal archaeological and ethnographic significance, with both the Ballardong and Whaduk groups attending the ethnographic survey. A number of recommendations were made and have been taken into account during project development where possible.

Key clearing assessment Items
The key clearing assessment items for this project include:

- No more than 10 ha of Critically Endangered 'Woodlands of the Wheatbelt' Threatened Ecological Community (TEC) to be cleared.
- No more than 33 ha of foraging habitat for Carnaby's Black Cockatoo to be cleared
- No more than 29.5 ha of foraging habitat for Baudin's Black Cockatoo to be cleared
- No more than 6 ha of foraging habitat for Red-tailed Black Cockatoo to be cleared
- No more than 1360 breeding trees for Black Cockatoo species and 94 hollows to be cleared.
- No more than 32.5 ha of Chuditch habitat to be cleared.
- Clearing in five significant vegetation communities.
- Clearing of three Priority flora species, *Grevillea candolleana* (Priority 2), *Boronia scabra* subsp. *condensata* (Priority 2) and *Hibbertia montana* (Priority 4).
- No more than 1.573 ha of wetland vegetation and 1.965 ha of riverine vegetation will be cleared for this project.
- 38.5 ha of vegetation to be cleared in an extensively cleared landscape.

Key vegetation management actions

An Environmental Management Plan has been prepared to minimise impacts to conservation significant fauna and flora. This is included in Appendix G.

1. ASSESSMENT SCOPE AND PROJECT DESCRIPTION

The Wheatbelt has been identified as having some of the most dangerous roads in Western Australia, with Toodyay Road recognised as one of the most dangerous roads in the Wheatbelt.

In the Wheatbelt Region, 144 people were killed and 836 people hospitalised over a period of 5 years (2011 to 2015). Of the 144 deaths, 54 (37.5%) involved hitting roadside vegetation (48 trees and 6 shrubs). The Wheatbelt has a fatal crash rate of 37 fatalities / 100,000 persons in the population, 5 times the State average and 8 times the National rate. With 3.2% of the population, the Wheatbelt contributes to only 2.0% of total recorded crashes in WA but 7.2% of serious crashes and 16.9% of all fatal crashes. A person is 8 times more likely to die if involved in an accident on a Wheatbelt road than the rest of WA.

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For the Wheatbelt section of Toodyay Road, a total of 50 crashes with 16 Killed or Seriously Injured (KSI) crashes were recorded over the last 5 years (2011 to 2015). The 16 KSI crashes included:

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Main Roads Wheatbelt Region is proposing to improve the safety of Toodyay Road as a result of these serious safety concerns. This project will involve the widening of a section of the road from approximately SLK 12 to SLK 40, with realignments to remove substandard curves that impair driver vision. The project will also include:

- Passing lanes
- Culvert extensions and additions
- Intersection upgrades
- Road realignments where required to provide passing opportunities, remove dangerous curves and improve sightline distances.

Bridges may also be upgraded to culverts, depending on funding.

The project was referred to the Department of the Environment in early 2016 (subsequently changed to Department of the Environment and Energy – "DotEE" in July 2016), and was deemed a 'Controlled Action' (EPBC 2016/7665). Clearing of native vegetation for this project is proposed through a State clearing permit. The project is considered to be at variance to Clearing Principles a), b), d), e), f) and may be at variance to h).

An environmental impact assessment was undertaken and documented in this report. This report outlines the key activities associated with the road project, the existing environment and an assessment of native vegetation clearing and matters of National Environmental Significance (NES). This assessment provides an evaluation of the impacts and strategies used to manage them.

It is considered that the project will have a residual environmental impact, and therefore an offset proposal has been prepared for submission with this report.

1.1 Project Location

The project area is located on Toodyay Road between SLK 12.75 to SLK 40.30, within the Shire of Toodyay.

MGA reference: 50

Toodyay Road at SLK 12.7
433553°38'37.4651"E 6491885°1'25.8379"N

Toodyay Road at SLK 40.14
450275°19'46.317"E 6508438°19'9.6069"N

The project area is shown in Figure 1.

Figure 1 – Project Area - Toodyay Road Widening SLK 12.75 to 40.3

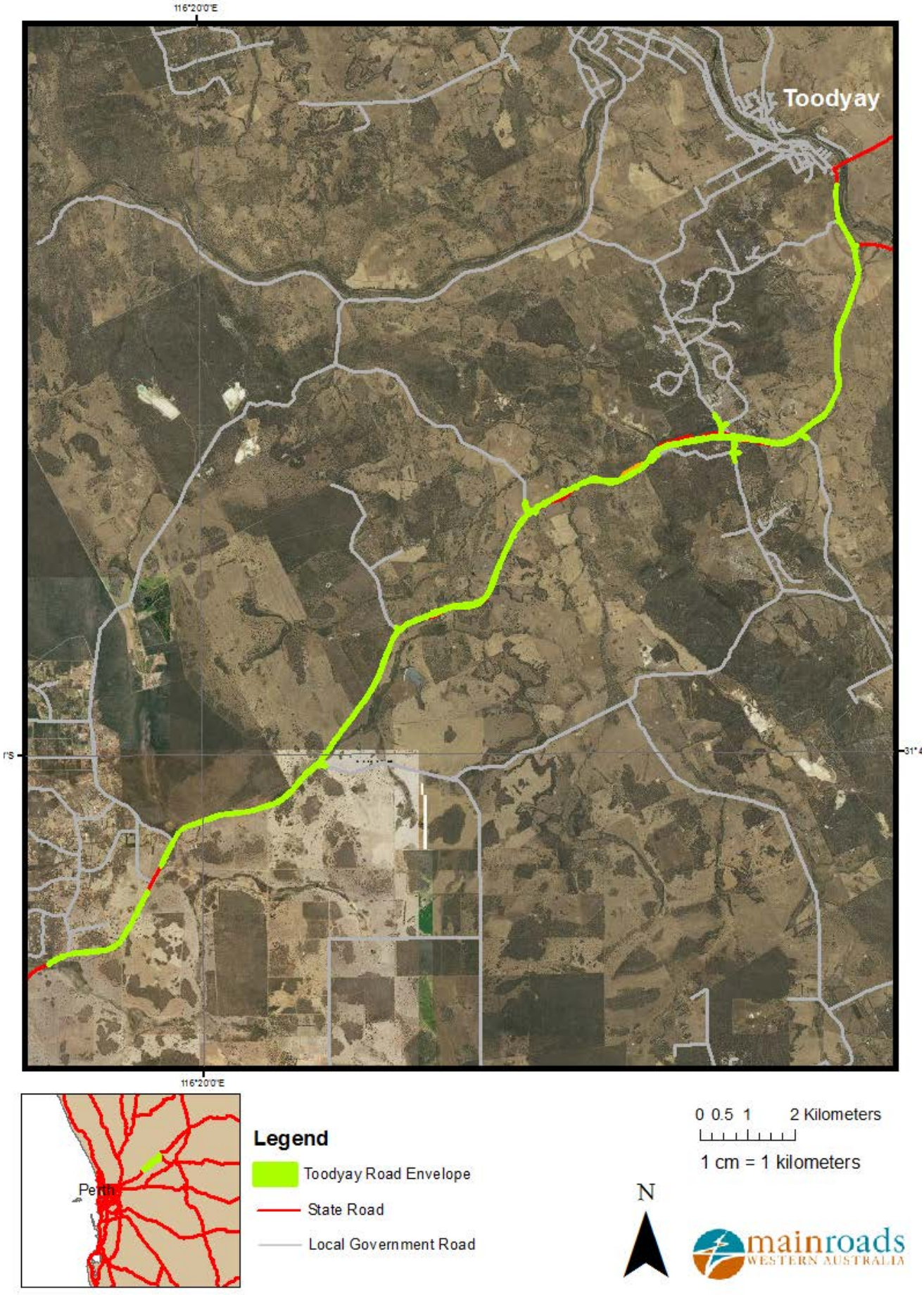
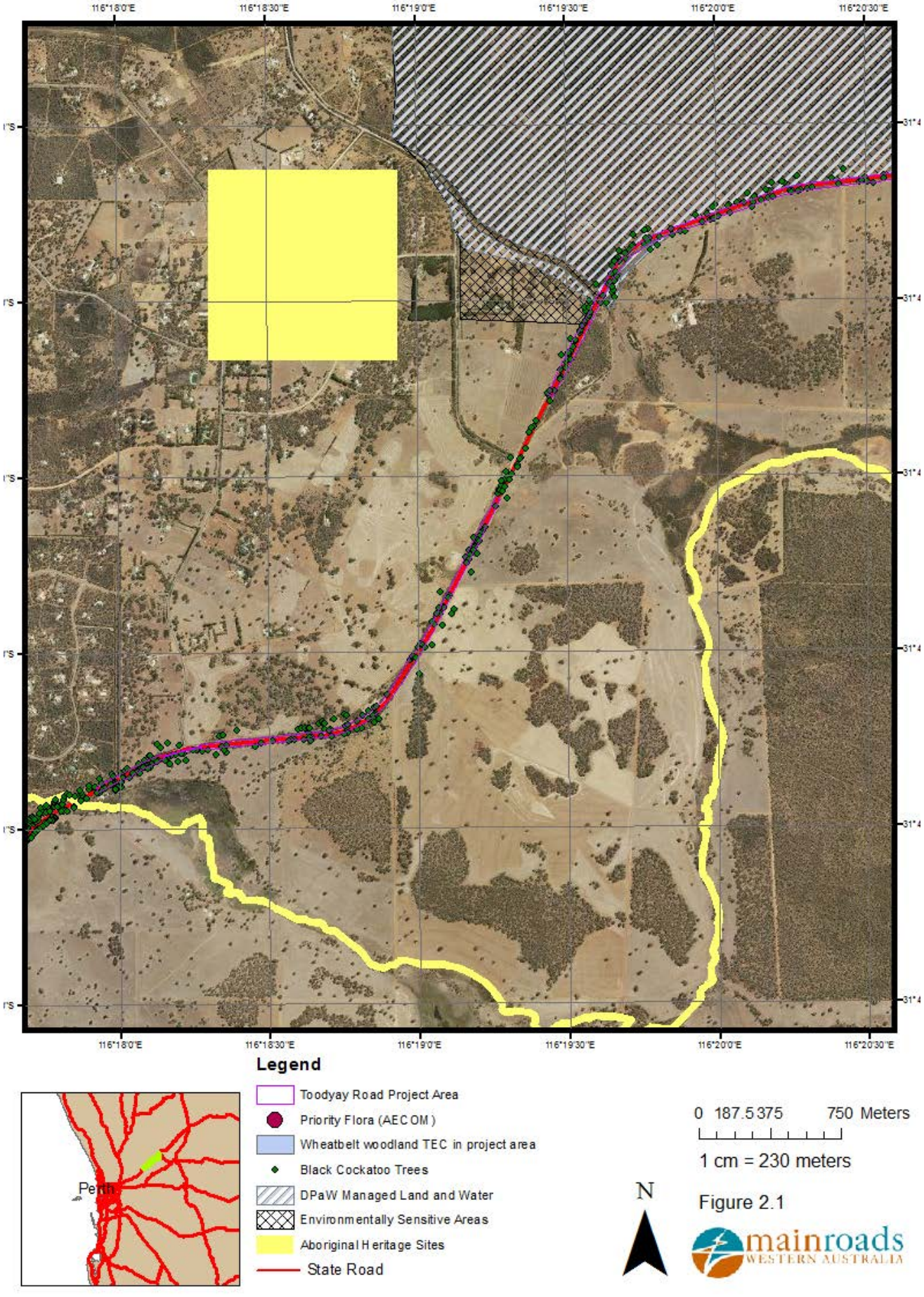


Figure 2 – Environmental Constraints | Toodyay Road Widening SLK 12.75 to 40.3



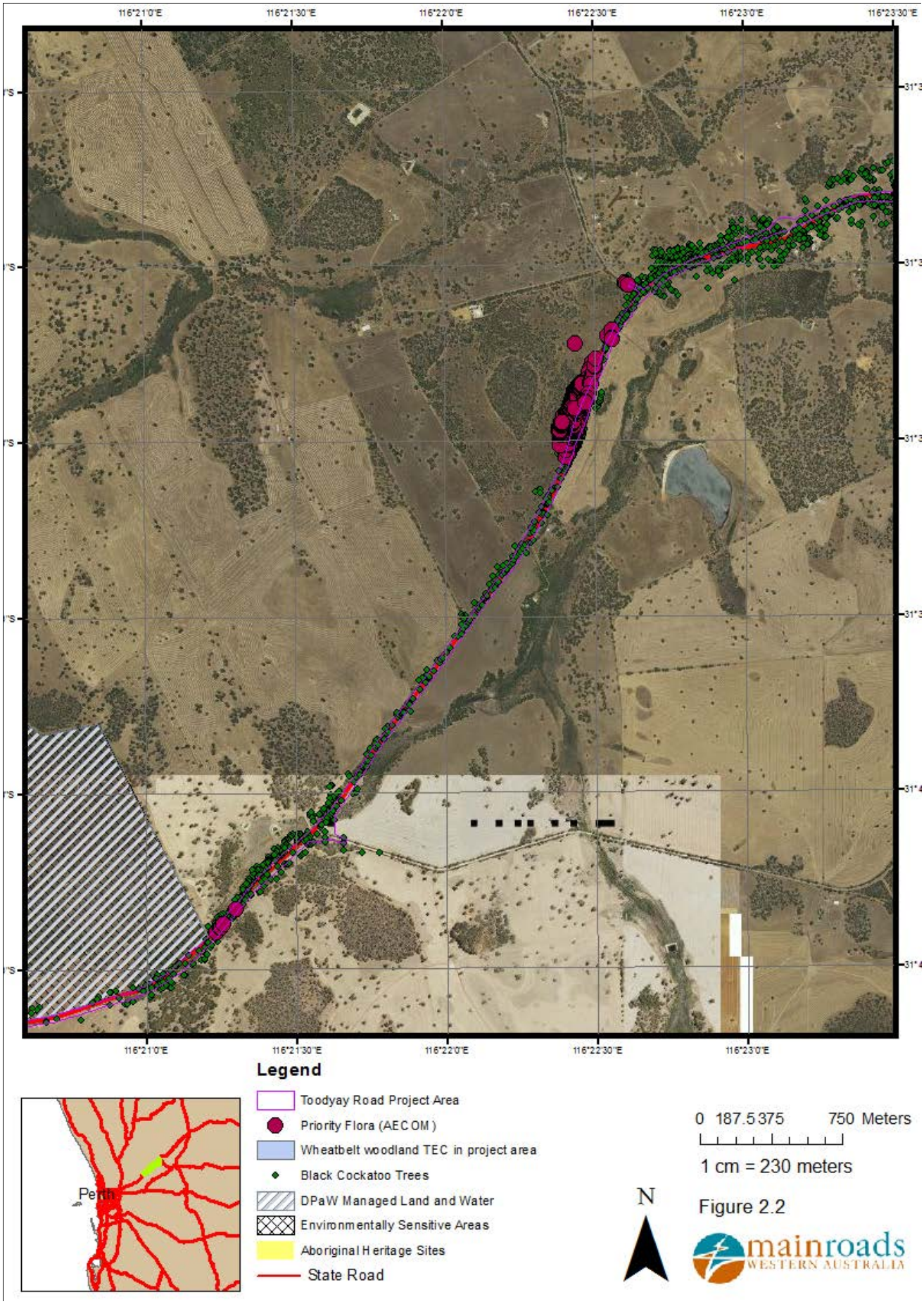
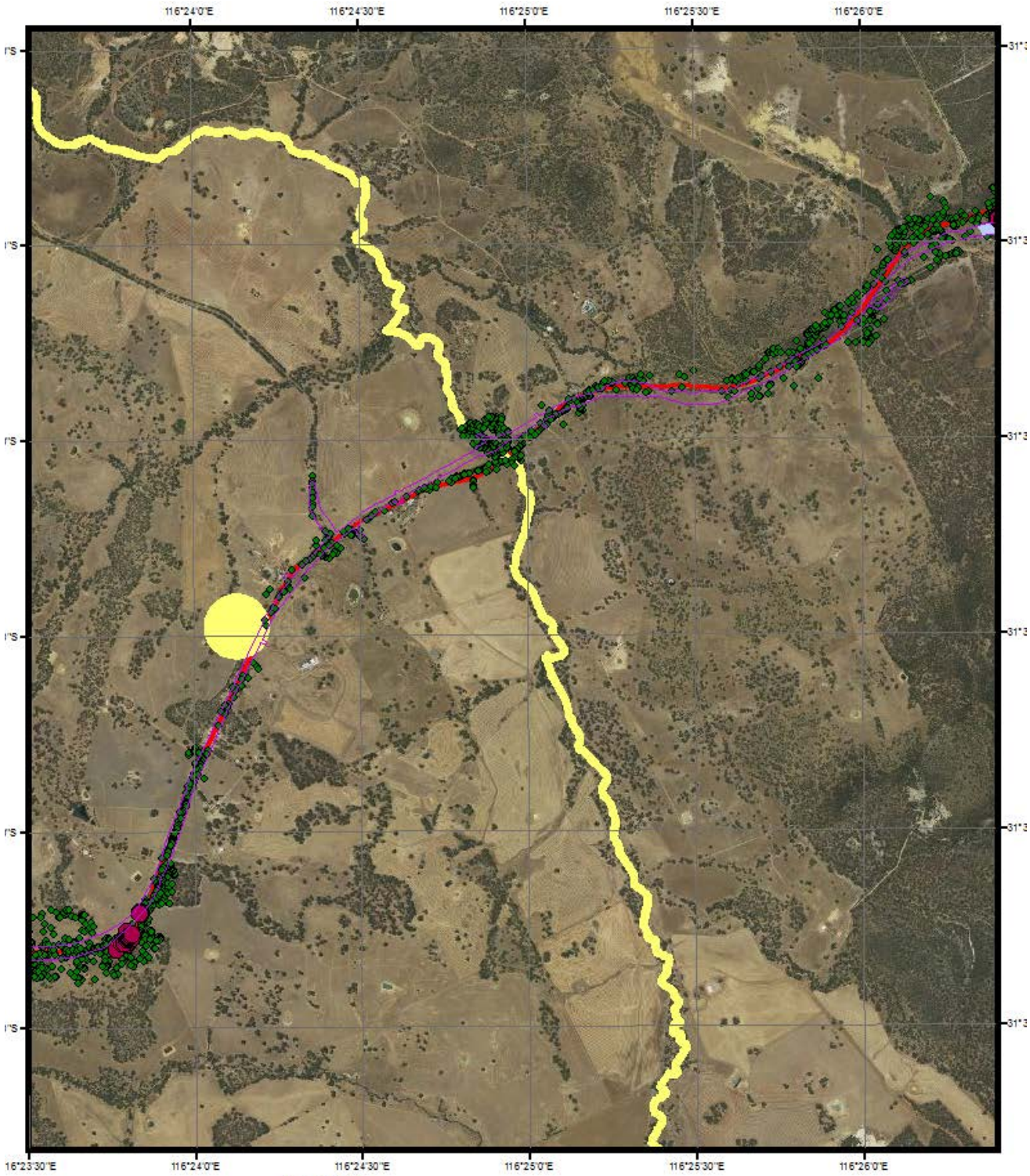

116°21'0"E
116°21'30"E
116°22'0"E
116°22'30"E
116°23'0"E
116°23'30"E
Legend
Toodyay Road Project Area
Priority Flora (AECOM)
Wheatbelt woodland TEC in project area
Black Cockatoo Trees
DPaW Managed Land and Water
Environmentally Sensitive Areas
Aboriginal Heritage Sites
State Road
Perth
0 187.5375 750 Meters
1 cm = 230 meters
N

Figure 2.2



Legend

- Toodyay Road Project Area
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- Black Cockatoo Trees
- DPaW Managed Land and Water
- Environmentally Sensitive Areas
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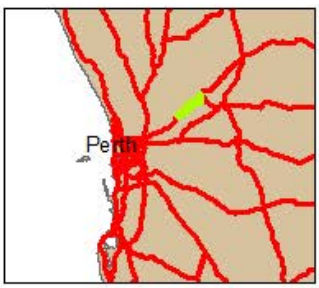
- State Road



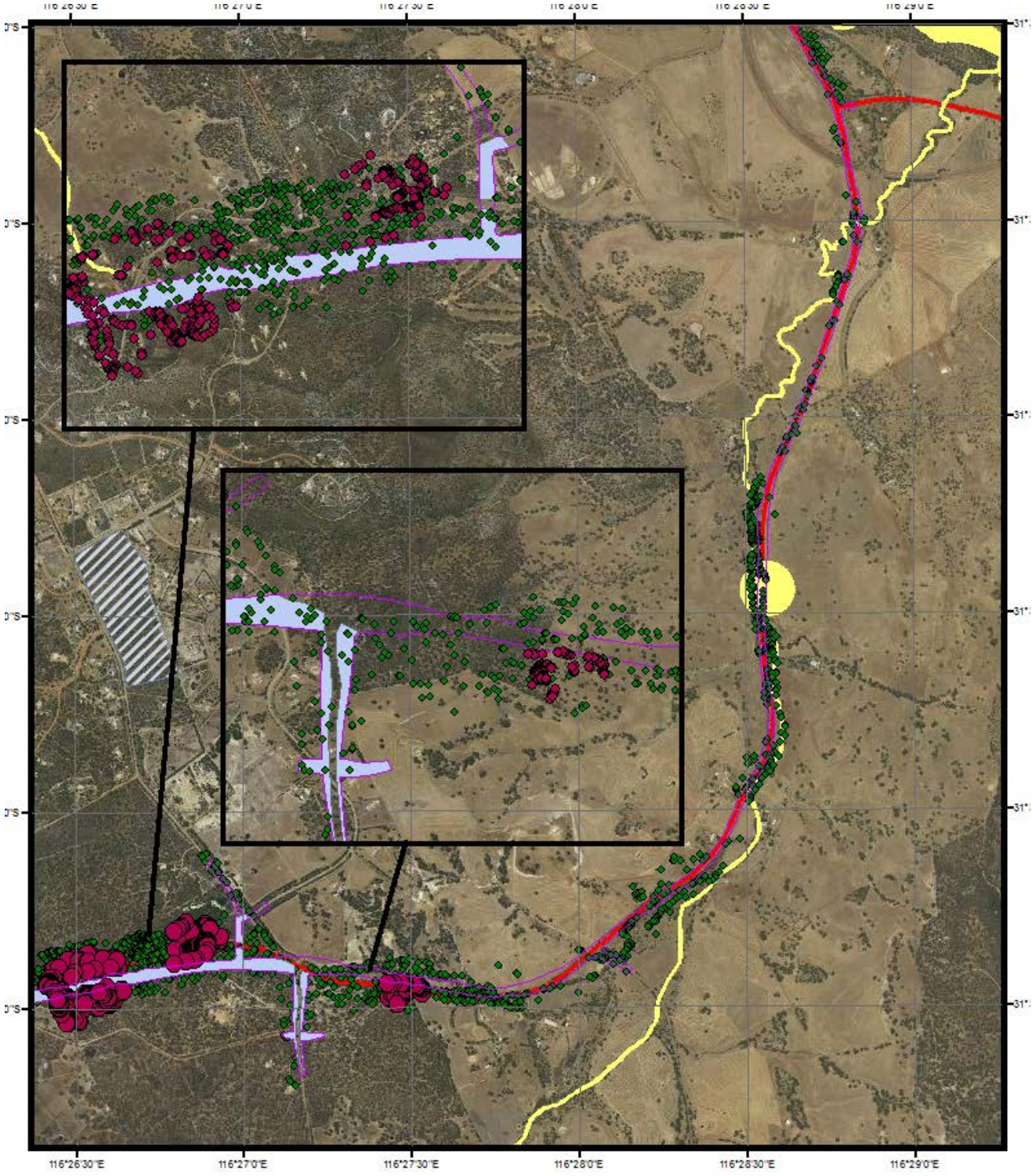
0 187.5375 750 Meters

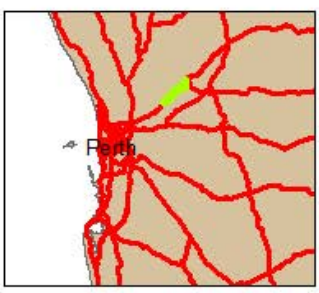
1 cm = 230 meters

N

Figure 2.3

mainroads WESTERN AUSTRALIA





Legend

- Toodyay Road Project Area
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- Wheatbelt woodland TEC in project area
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- DPaW Managed Land and Water
- Environmentally Sensitive Areas
- Aboriginal Heritage Sites
- State Road

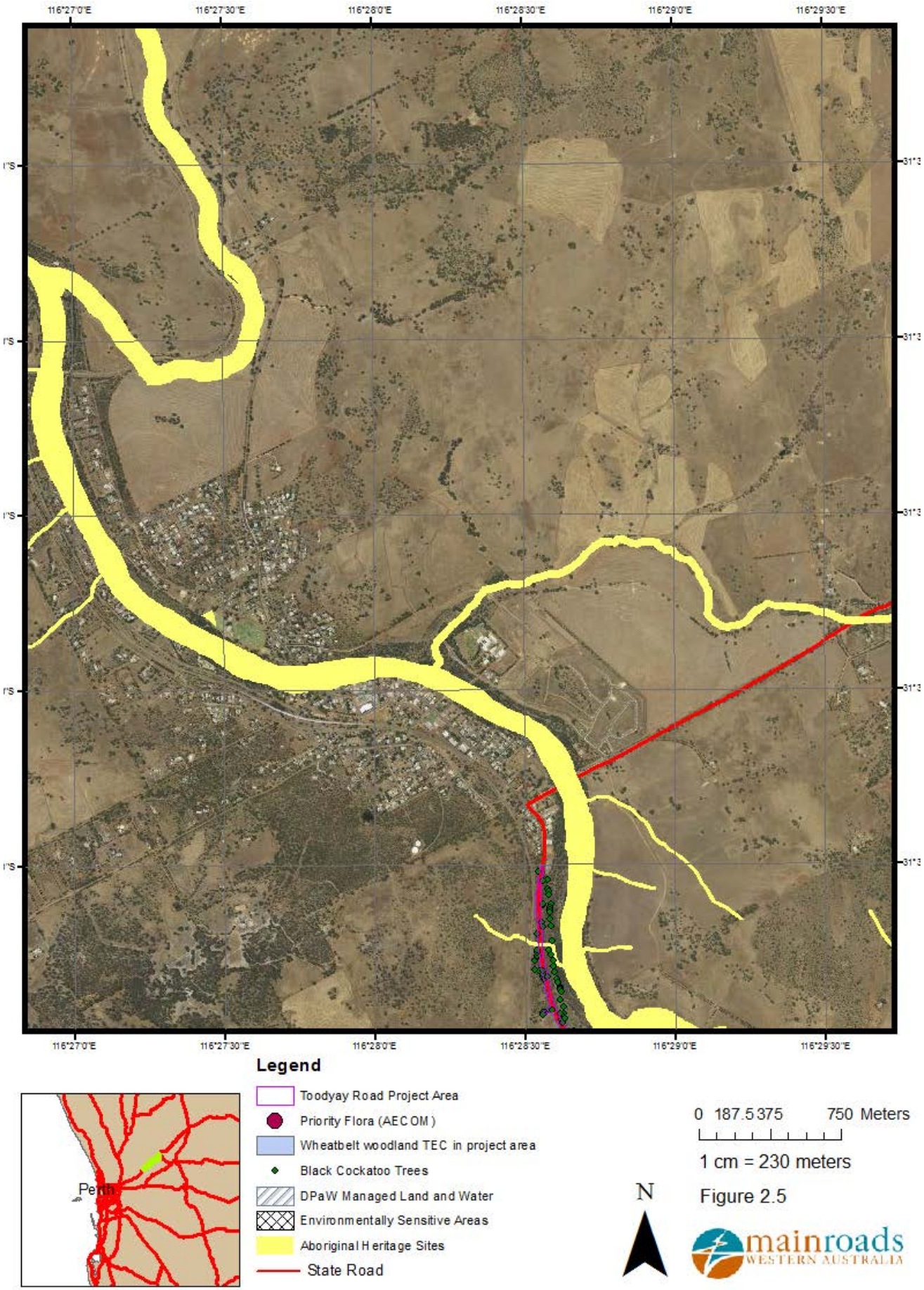
0 187.5375 750 Meters

1 cm = 230 meters

N

Figure 2.4

mainroads WESTERN AUSTRALIA


116°27'0"E
116°27'30"E
116°28'0"E
116°28'30"E
116°29'0"E
116°29'30"E
Legend
Toodyay Road Project Area
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State Road
Perth
0 187.5375 750 Meters
1 cm = 230 meters
N
Figure 2.5
mainroads
WESTERN AUSTRALIA

2. METHODOLOGY

A preliminary environmental assessment of the project area and the potential constraints of the proposal were undertaken by viewing ArcGIS shapefiles, reviewing government agency managed databases and consulting with relevant stakeholders where necessary.

The project is to be assessed by DER under the Commonwealth-State Assessment Bilateral. An environmental impact assessment of the project was undertaken; the findings are in this report. This report outlines the key activities associated with the road project, the existing environment and an assessment of native vegetation clearing and matters of NES. The methodology used when completing an assessment of the clearing principles is provided in Section 3.3.

Key stakeholders were consulted to engage and inform them of the proposed project activities. Information from stakeholders was considered and incorporated in the project design where practicable.

Further details regarding the outcome of the field survey are provided in Section 5 and in the Appendices.

2.1 Biological Surveys

The project was surveyed by AECOM Pty Ltd in spring 2015. This included a fauna assessment plus targeted survey for Black Cockatoos. Significant trees, foraging and roosting habitat were targeted as per the referral requirements for DotEE, detailed in *Environmental Protection and Biodiversity Conservation* (*EPBC) Act Referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo, Baudin's cockatoo and Forest red-tailed black cockatoo* (DSEWPaC 2012). A flora assessment was also undertaken by AECOM to identify threatened and priority flora species, vegetation type and condition and ecological communities.

The initial spring survey area included Toodyay Road for both Wheatbelt and Metropolitan regions. Subsequent surveys were only for the Wheatbelt region. Metropolitan region projects are not the subject of this report.

After liaising with the Department of Parks and Wildlife (DPaW), an additional survey was undertaken in February 2016 for the Wheatbelt section of Toodyay Road. This was to survey areas that were added to the project after the 2015 survey, and to provide additional data as per DPaW requirements regarding rare and priority flora. Additional data provided included the exact population counts of priority flora in the project area, as well as clarification on the absence or presence of the Threatened Ecological Community Woodlands of the Wheatbelt, which was listed in late 2015.

Due to an extremely dry summer, the February 2016 survey was not robust. An additional spring survey was then commissioned for 2016, to provide more vigorous flora population counts, survey additional areas added to the project design since February 2016, and address habitat data for Red-tailed Black Cockatoos that was missing from the original report.

Main Roads also commissioned a Chuditch targeted survey for spring 2016 to determine the presence and value of the project area to this species. A memo of survey results has been provided with the report to follow in January 2017.

3. CLEARING OF NATIVE VEGETATION

Under the *Environmental Protection Act 1986* (EP Act), native vegetation includes all indigenous aquatic and terrestrial vegetation (living or dead) but does not include vegetation that was intentionally sown, planted or propagated unless it was required under a statutory condition.

3.1 Measures to Avoid and Minimise Clearing:

The project has been modified several times to minimise clearing as far as possible, and Main Roads has made every effort to protect environmental features during project development, including:

- An entire population of *Hibbertia montana* (Priority 4) was to be removed for the project (1770 plants). The design has been amended to retain 60% of the individuals at this location. No more than 792 *Hibbertia montana* will be removed for the project in total.
- A number of Priority flora were identified adjacent to the road in the project envelope. The design has attempted to 'weave' in between populations of Priority flora and Black Cockatoo trees, where safety allows (See Figure 2.4). The envelope was modified and Priority flora clearing has been minimised where possible. The number of *Grevillea candolleana* plants that were to be removed for the project was reduced from 13 to 10, which accounts for 3.6% of this species recorded in the spring survey. A total of 37 *Boronia scabra* subsp. *condensata* plants were to be removed for the project. This has been reduced to 10 plants, and accounts for 3.11% of this species recorded in the spring surveys.
- The project was amended to avoid removing any vegetation associated with the Morangup Nature Reserve. No direct impacts to the reserve will result from this project.
- The locations of potential breeding trees for Black Cockatoos identified in the spring survey were provided to the designers, and changes made to the design to minimise the number of trees to be removed.
- One known Black Cockatoo breeding tree was observed to be in use during the spring survey in 2015. This tree is outside the project design.
- Main Roads owns a parcel of land (R 430; SLK 26) which was identified as Eucalypt woodland in Good condition (Keighery, 1994), and dieback free. Drainage control was implemented to reduce the risk of dieback infestation at this location. Further, Main Roads is liaising with the local government to assess whether an old school on this parcel of land meets the criteria to be included in the municipal register. Main Roads is proposing to include this block into the adjacent landowner's holdings, and to place a conservation covenant on it.
- The project was surveyed for dieback infestation, and the project design was modified to include drainage along protectable features such as the Morangup Reserve, to prevent water runoff from the road that could potentially result in dieback contamination and spread.
- No clearing is permitted for site offices or laydown. The project will utilise existing cleared areas for these facilities.
- Three dams around SLK 32.7 (east of Sandplain Road and Salt Valley Road) are known to be used by fauna in the local region, including birds. The project has been modified to prevent impacts to one of the three dams, the others will be reconstructed. The impacts to this location have been minimised as far as possible during concept design.
- Consultation with the Whadjuk and Ballardong Aboriginal groups has resulted in requests to minimise the impacts to waterways, where possible. Main Roads is investigating the viability of waterway improvements along the road where works are conducted, including potential for planting riparian vegetation to reduce sedimentation. This will be dependent upon final design and the width of the road reserve at these locations, as well as the condition of adjacent vegetation.
- Three waterways were originally to be impacted by the project. The project design has been changed, with batters steepened, in order to prevent construction in river beds and modifications to waterways at these locations.
- Chuditch was identified as a species potentially impacted by the project. A detailed survey was undertaken in late 2016. No Chuditch were observed and no indirect evidence of Chuditch was found in the project area. No more than 32.5 hectares (ha) of potential Chuditch habitat will be cleared for the project.
- Where possible, driveways and other access points were provided in already cleared locations, providing it was safe to do so.
- A number of offset options were considered for this project, including the revegetation of the roadside corridor to replace fauna linkages removed for the project. Unfortunately this was

not considered a viable offset option as the road corridor is not able to be placed under a Conservation Covenant due to its long linear nature that is subject to edge effects.

- Moving the road was also considered, to avoid clearing native vegetation. This was not considered feasible due to landowner and stakeholder issues, as well as budgetary constraints. The widening of Toodyay Road is costing an average of $880,000 per kilometre, the realignment sections are in excess of $2.8 million per kilometre. Realignment is not considered feasible for the entire road length.

3.2 Existing Vegetation Details

3.2.1 Project site vegetation description

Beard's (1981) 1:250 000 vegetation series map shows four broad terrestrial vegetation types that occur within the project envelope.

For a full description of the existing vegetation, refer to the Biological Assessment in Appendix A.

3.2.2 Vegetation complexes and representation

Table 2: Vegetation Representation

		Pre–European (ha)	Current Extent (ha)	% Remaining	% Remaining in DEC reserves
IBRA Region Avon Wheatbelt		9,517,109.90	1,763,063.03	18.53	9.74
Beard Vegetation Association 352 described as Medium woodland; York gum (Government of Western Australia, 2013)	State-wide	724,272.97	142,749.73	19.71	8.85
	Beard Vegetation Association In IBRA region	630,581.75	109,440.96	17.36	9.28
	Shire of Toodyay	43,385.51	6,008.16	13.85	0.04
IBRA Region Jarrah Forrest		4,506,660.26	2,422,782.95	53.76	69.01
Beard Vegetation Association 4 described as Medium woodland; marri & wandoo (Government of Western Australia, 2013)	State-wide	1,054,279.89	293,916.91	27.88	22.74
	Beard Vegetation Association In IBRA region	1,022,712.70	286,845.32	28.05	22.98
	Shire of Toodyay	51,980.93	27,994.66	53.86	33.26

Table 2: Vegetation Representation

Beard Vegetation Association 1006 described as Medium woodland; jarrah, wandoo & powderbark (Government of Western Australia, 2013)	State-wide	44,908.30	21,814.68	48.58	46.22
	Beard Vegetation Association In IBRA region	44,908.30	21,814.68	48.58	46.22
	Shire of Toodyay	20,929.16	12,718.56	60.77	59.20
Beard Vegetation Association 3003 described as Medium forest; jarrah & marri on laterite with wandoo in valleys, sandy swamps with teatree and Banksia (Government of Western Australia, 2013)	State-wide	66,451.58	39,080.86	58.81	46.36
	Beard Vegetation Association In IBRA region	66,451.58	39,080.86	58.81	46.36
	Shire of Toodyay	9,278.41	5,671.59	61.13	61.82

Vegetation complex mapping has been undertaken on the Darling Scarp with spatial data available from Heddle *et al*. (1980) and per cent remaining published by the Local Biodiversity Program (2013) and Perth Peel @ 3.5 Million (EPA, 2015).

Vegetation Complex	Description	% Remaining
Bindoon	Woodland of *Eucalyptus loxophleba* on the slopes flanked by woodlands of *Eucalyptus wandoo-Eucalyptus accedens* on the breakaways and upper slopes in the perarid zone.	29.21
Yalabee Y5	Mixture of open forest of *Eucalyptus marginata* subsp. *thalassica - Corymbia calophylla* and woodland of *Eucalyptus wandoo* on lateritic uplands in semiarid to perarid zones.	66.37
Yalanbee Y6	Woodland of *Eucalytpus wandoo-Eucalyptus accedens* less consistently open forest of *Eucalyptus marginata* subsp. *thalassica- Corymbia calophylla* on lateritic uplands and breakaway landscapes in arid and perarid zones.	46.9
Coolakin	Woodland of *Eucalyptus wandoo* with mixtures of *Eucalyptus patens, Eucalyptus marginata* subsp. *thalassica* and *Corymbia calophylla* on valley slopes in arid and perarid zones.	39.38
Michibin	Open woodland of *Eucalyptus wandoo* over *Acacia acuminate* with some *Eucalyptus loxophleba* on valley slopes, with low woodland of *Allocasuarina huegeliana* on or near shallow granite outcrops in arid and perarid zones.	26.07

Pindalup	Open forest of *Eucalyptus marginata* subsp. *thalassica-Corymbia calophylla* on slopes and open woodland of *Eucalyptus wandoo* with some *Eucalyptus patens* on the lower slopes in semiarid and arid zones.	76.98
Swamp	Mosaic of low open woodland of *Melaleuca preissiana-Banksia littoralis*, closed scrub of Myrtaceae species, closed heath of Myrtaceae species and sedgelands of Baumea and Leptocarpus species on seasonally wet or moist sand, peat and clay soils on valley floors in all climatic zones.	75.91
Dwellingup D4	Open forest to woodland of *Eucalyptus marginata* subsp. *thalassica- Corymbia calophylla* on lateritic uplands in semiarid and arid zones.	87.4

3.3 Assessment Against the Ten Clearing Principles

In assessing whether the project is likely to have a significant impact on the environment, the project was assessed against the Ten Clearing Principles (EP Act 1986, Schedule 5).
The project is considered to be at variance to Principles a), b), d), e), and f), and may be at variance to h).

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

Comments	**Proposal is at variance to this Principle**

362 native vascular flora taxa were recorded within the survey area, representing 161 genera and 54 families. The most abundant families included Fabaceae (pea family) with 62 species, Myrtaceae with 33 species and Proteaceae with 32 species.
During the survey, 21 orchid species were recorded, including one Priority 4 orchid, *Caladenia integra.* No *Caladenia integra* will be cleared for the project.

21 native vegetation communities were recorded in the project area and one planted:

Vegetation community	**Hectares (ha)**
CcLeAp	0.04
CcXpHh	10.24
CcXpLb	0.50
EaXpBe	7.24
EdBn	0.10
ElAaAb	1.21
EmXpBd	3.93
ErAsOp	0.065
ErMvLd	2.522
ErPlCc	0.099
EwAaAb	0.529
EwAbBs	1.966
EwBsLp	0.459
EwGtAl	8.979
EwHuAn	0.038
MpHvLl	0.244
Trees Cc	0.0036
Trees El	1.747
Trees ErEl	1.845
Trees mix	12.78
trees Ea	0.333
Total native vegetation	**54.87**

Planted vegetation	*0.32*

Five of the populations identified are considered significant or not well represented and support populations of Priority flora and/or have unique vegetation composition as detailed in the following table:

Vegetation community	Description and condition	Ha to be cleared
CcXpHh	*Corymbia calophylla* and *Eucalyptus marginata* mid open forest to woodland over *Xanthorrhoea preissii*, *Banksia sessilis* var. *sessilis* and *Acacia pulchella* mid to tall sparse shrubland over *Hibbertia hypericoides*, *Tetraria octandra* and *Phyllanthus calycinus* low open shrubland. Condition ranged from Completely Degraded to Very Good. This community is significant due to the presence of a large population of *Hibbertia montana*.	10.24
EwGtAl	*Eucalyptus wandoo* subsp. *wandoo*, *Corymbia calophylla* and *Eucalyptus accedens* mid open forest over *Gastrolobium truncatum*, *G. parviflorum* and *Xanthorrhoea preissii* mid open shrubland over *Acacia lasiocarpa* var. *sedifolia*, *Opercularia vaginata* and *Hakea lissocarpha* mid open heath shrubland. The community was considered in Very Good to Excellent condition. This community is significant due to the presence of Priority flora populations including *Boronia scabra* subsp. *condensata*, *Calytrix oncophylla*, *Grevillea candolleana* and *Hibbertia montana*.	8.979
EwBsLp	*Eucalyptus wandoo* subsp. *wandoo* and *Corymbia calophylla* mid woodland over *Banksia squarrosa* subsp. *squarrosa*, *Leptospermum erubescens* and *Banksia sessilis* var. *sessilis* tall shrubland over *Leucopogon propinquus*, *Dillwynia laxiflora* and *Hibbertia commutata* low isolated heath shrubland. This community is in good condition. This community is significant due to the presence of Priority flora populations.	0.459
EaXpBe	*Eucalyptus accedens*, *Eucalyptus wandoo* subsp. *wandoo* and *Corymbia calophylla* mid open forest over *Xanthorrhoea preissii*, *Banksia squarrosa* subsp. *squarrosa* and *Acacia pulchella* var. *pulchella* mid to tall isolated clumps of shrubs over *Bossiaea eriocarpa*, *Petrophile divaricata* and *Astroloma epacridis* low open shrubland. Condition was Good to Excellent. This community is significant due to the presence of Priority flora populations including *Boronia scabra* subsp. *condensata*, *Calytrix oncophylla* and *Grevillea candolleana*.	7.24
EdBn	*Eucalyptus drummondii* mid isolated trees over *Banksia nivea* subsp. *Morangup* (P2), *Kunzea micrantha* subsp. *micrantha* and *Hakea incrassata* low heathland. EdBn was in Excellent condition, situated mostly in Morangup Nature Reserve on sandy clay red soils. This community lacks a tall to mid shrub stratum. The area is seasonally damp and incorporates a unique floristic composition including two Priority flora populations. For this reason community EdBn are considered significant.	0.1

The project is in an area with varying condition as detailed below.

Condition	Hectares (ha)
Completely Degraded	0.066
Degraded	31.13
Good	9.3
Very Good	9.31
Excellent	5.388

Seven conservation significant flora species were recorded within the survey area including *Banksia nivea* subsp. Morangup (Priority 2), *Boronia scabra* subsp. *condensata* (Priority 2)*, Calytrix oncophylla* (Priority 2)*, Grevillea candolleana* (Priority 2), *Verticordia citrella* (Priority 2), *Hibbertia montana* (Priority 4) and *Caladenia integra* (Priority 4).

Within 50 m of the project, AECOM recorded:

- *Calytrix oncophylla* - 4 individuals
- *Boronia scabra* subsp. *condensata* – 171 individuals
- *Grevillea candolleana* (Priority 2) – 144 individuals
- *Hibbertia montana* (Priority 4) – 1675 individuals

Three Priority flora will be cleared for the project as detailed below.

Grevillea candolleana (Priority 2)

Grevillea candolleana was recorded in five quadrats (Too10, 11, 15, 20, 38). Three occurrences were in Wandoo woodland, one occurrence in Powderbark Wandoo woodland on a lateritic outcrop, and one occurrence in Marri woodland. Two occurrences were in roadside vegetation and three occurrences were within large expanses of contiguous native vegetation.

Targeted searches in 2015 and 2016 identified six distinct *G. candolleana* populations, with a total of 276 individuals. DPaW have advised that this species is known from 16 populations from five locations between Lower Chittering, Toodyay and Clackline. Up to 10 *G. candolleana* plants will be removed for the project, which accounts for 3.62% of the plants recorded in the spring survey and is not considered a significant impact upon this population.

Boronia scabra subsp. *condensata* (Priority 2)

Boronia scabra subsp. *condensata* was recorded in two quadrats (Too17 and 38) in October 2015 and September 2016. Database results show one population near Toodyay more than three kilometres north of the survey area. A total of 321 plants were recorded from two distinct populations. *B. scabra* subsp. *condensata* is known from five populations (counts not provided), with the closest being 3.4km north of the AECOM populations in the Perth Hills District. Populations in this area are considered locally and regionally significant by DPaW. No more than 10 *B. scabra* subsp. *condensata* plants will be removed for the project. This accounts for 3.11% of the plants recorded in the spring surveys. The clearing is not considered to have a significant impact, and the removal of 10 plants will not impact the conservation status of this species.

Hibbertia montana (Priority 4)

The habitat of *Hibbertia montana* varies considerably. Population 1 around SLK 23.1 was recorded in degraded *Allocasuarina fraseriana* and Eucalyptus woodland over sparse shrubs with no native understorey (ground cover) species present. The population is predominantly located on private property with evidence of grazing. The species in this population were even recorded in the middle of grassy paddocks with no overstorey species. Population 2 and 3 were recorded in 'Excellent' condition Wandoo woodland as part of a larger block of contiguous native vegetation. A total of 1,909 plants were counted and mapped within and extending beyond the survey area. *Hibbertia montana* is

	known from 15 locations over a 200km north-south and 100km east-west range. No more than 792 *Hibbertia montana* will be cleared for the project, accounting for 41% of the plants recorded in the spring surveys. Thirty-eight introduced flora species were recorded within the survey area, none of these are in the project area. The project is considered to be at variance with this principle.
Methodology	AECOM (2016a) MRWA GIS Shapefiles

(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

Proposal is at variance to this Principle

Fauna habitats in the project area are detailed below:

Fauna habitat type	Hectares (ha)
Eucalypt woodland	32.439
Native Shrubland	0.462
Heath	0.1
Wetland	1.573
Isolated trees	18.33
River	1.966
Total Native Vegetation	**54.87**
Planted vegetation	*0.32*

Planted vegetation was in mainly Degraded to Completely Degraded condition and comprised 0.58% of the project area. Planted vegetation in the project area was not identified as suitable habitat for threatened or priority fauna.

Two Threatened fauna species were recorded during the AECOM surveys (AECOM 2016a), including the Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii* subsp. *naso*).
Black Cockatoo roosting habitat is generally found in or near riparian vegetation, close to fresh water and typically is comprised of the tallest trees in these areas (DSEWPaC, 2012a). The majority of the project is within 50 m of freshwater wetlands, rivers or dams, however no confirmed roosting trees were observed in the survey area.

A survey of Black Cockatoo potential breeding trees was also undertaken for the project. 7300 potential breeding trees were recorded in the spring surveys. No more than 1360 black cockatoo trees will be cleared for the project, accounting for 18.6% of the trees recorded in the survey area. Of these, no more than 94 trees with hollows will be cleared. Further impacts to Black Cockatoos will be managed in the project EMP by clearing breeding trees with hollows outside the breeding season wherever possible. Where this is not possible, an assessment of hollows will be made and birds relocated (see EMP).

Carnaby's Black Cockatoo feed on seeds, nuts and flowers of a variety of native and exotic plants. Feed plants include proteaceous species (e.g. Banksia, Grevillea and Hakea), *Corymbia calophylla* (Marri), Eucalyptus

	(e.g. Jarrah [*Eucalyptus marginata*]), and seeds from the cones of Pine trees (Pinus sp.). Up to 33 ha of foraging for Carnabys Black Cockatoos will be cleared for the project, of which 59.8% is in Degraded or Completely Degraded condition (Keighery 1994) and 40.2% is in Good or better condition. Red-tailed Black Cockatoos predominantly feed in eucalypt forests, preferring Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) seeds, but also feeding on Blackbutt (*Eucalyptus patens*), Albany Blackbutt (*Eucalyptus staeri*), Karri (*Eucalyptus diversicolor*), Sheoak (*Allocasuarina fraseriana*) and Snottygobble (*Persoonia longifolia*) (Johnstone, 2016 pers. comm.). Up to 6 ha of foraging for the Red-tailed Black Cockatoo will be cleared for the project, 99.9% of which is in Good or better condition. Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) (Threatened), Western Brush Wallaby (*Macropus irma*) (Priority 4), Blue-billed Duck (*Oxyura australis*) (Priority 4) and Peregrine Falcon (*Falco peregrinus*) (OS) were also considered likely to occur. Baudin's Black Cockatoo looks similar to Carnaby's Black Cockatoo and it is possible recordings of Baudins were listed as Carnaby's. Up to 29.5 ha of foraging habitat suitable for Baudin's Black Cockatoo will be cleared, 58% of which is in Degraded or Completely Degraded condition, 42% in Good or better condition. The Western Brush-wallaby is a Priority 4 species and only occurs in the south-west of Western Australia. Preferred habitat consists of open sclerophyll forest or woodland and favours open flats over scrub thickets. It is also found in larger areas of mallee and heathland in the Wheatbelt and is uncommon in wet sclerophyll forest (Van Dyck & Strahan, 2008). It has been recorded as recently as 2010 in the local area, with a total of six records within seven kilometres (DPaW, 2015). This species was recorded in the targeted Chuditch survey. The habitats of the project area are well represented in the surrounding landscape although it is a highly fragmented setting. For this reason, the habitats of the project area are not considered to represent significant habitat for the species. The Blue-billed Duck is endemic to south-eastern and south-western Australia. It prefers deep water in large permanent wetlands and swamps with aquatic vegetation. This species of duck is fully aquatic and rarely comes onto land (AECOM 2016). This species has been recorded within seven kilometres of the project area four times, most recently in 2012 (DPaW, 2015). It is considered unlikely to occur within the project area based on the fauna habitats present. The Peregrine Falcon occurs across much of mainland Australia occupying diverse habitats, from rainforest to arid scrubland. It relies on abundant prey, secure nest sites and a lack of human interference (Pizzey & Knight, 2007). This species was not recorded during the survey; however it still may be an infrequent visitor to the area. Chuditch (*Dasyurus geoffroii*), listed as Vulnerable under the EPBC Act and WC Act, was also considered likely to occur. Formerly the Chuditch occurred over nearly 70% of the Australian continent from Western Australia across to Queensland, New South Wales and Victoria (DEC, 2012a).

	Currently the Chuditch only occurs in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008). The majority of records are found in the contiguous Jarrah forests of Southwestern Australia (DotEE, 2015). The species is thought to occur in the local area from four records within seven kilometres, the most recent in 2009. A targeted Chuditch survey was undertaken in late 2016 (AECOM 2016b). No indirect evidence of the Chuditch was recorded along transects in any of the vegetation units/habitats searched and no Chuditch were recorded in the project area in camera traps (See Appendix B). No more than 32.5 ha suitable for Chuditch will be removed for the project. Three migratory birds are also considered likely to occur, Common Sandpiper (*Actitis hypoleucos*), Fork-tailed Swift (*Apus pacificus*) and Eastern Great Egret (*Ardea modesta*). These are detailed in Table 3. The Marine listed Rainbow Bee-eater (*Merops ornatus*) was recorded by AECOM in the survey. Waterways and dams around SLK 32.7 will require modification for the project. This location is known to be used by birds and will be impacted as part of the project. No Threatened or Priority birds are expected to be impacted by the works at this location. The project design has been minimised at this location as much as possible during concept design. Two of the three dams in this location will be removed and reconstructed outside the project footprint. The project is considered to be at variance with this principle.
Methodology	AECOM (2016a) AECOM (2016b) MRWA GIS Shapefiles

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

Comments	**Proposal is not at variance to this Principle**
	No Threatened (Declared Rare) flora are inside the project area. None were identified in either spring survey. The project is not at variance to this principle.
Methodology	AECOM (2016a)

(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	**Proposal is at variance to this Principle**
	Appendix A includes an assessment of the project against the conservation advice (TSSC 2015) for the Wheatbelt Woodland Threatened Ecological Community. Based on this assessment, the project will remove approximately 10 ha of woodland that meets the TEC requirements. No other TECs are likely to be impacted. The project is considered to be at variance to this principle.
Methodology	AECOM (2016a) Conservation advice (TSSC 2015)

(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	**Proposal is at variance to this Principle**
	Two pre-European vegetation associations (Beard 1981) and two Heddle et al. (1980) vegetation complexes are below the 30% threshold for 'concern' (see Section 3.2). 38.5 ha of vegetation in an extensively cleared landscape will be cleared for the project. The project is considered to be at variance to this principle.
Methodology	Keighery (1994) AECOM (2016a) Government of Western Australia (2015) Heddle et al. (1980)

(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	**Proposal is at variance to this Principle**
	No more than 1.57 ha of wetland vegetation and 1.97 ha of riverine vegetation will be cleared for this project. Toodyay Road was built upon the original track used by the Aboriginal people to move between camp sites. As a result, the Wheatbelt section of Toodyay Road crosses a number of distributaries of the Swan River, and is built within close proximity to waterways at three locations. The design has been modified at these locations to prevent direct impacts. The project may include upgrade to culverts and bridges as funding permits. Waterways and dams around SLK 32.7 will require modification for the project. Of the three dams in this area, one will remain and two will be moved and rebuilt outside the project footprint. The drainage changes to the location will be minimised as far as practicable and reconstructed as part of the project. The majority of the project is in a *Waterways Conservation Act 1976* Management Area, which makes it a sensitive water resource under the 'Water Quality Protection Note 44: Roads near sensitive water resources'. The project has been designed in accordance with the protection note so as to minimise impacts to waterways. A Bed and Banks permit has been obtained for the works (Appendix E). The project is considered to be at variance with this principle.
Methodology	DoW and DPAW shapefiles AECOM (2016a)

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

Comments	**Proposal is not likely to be at variance to this Principle**
	The project runs parallel to distributaries of the Swan River in a number of places, these areas have a high flood risk (>70%). The remainder of the

	project has a low flood risk (<3%). Salinity risk is mapped as moderate to high (50%+) around watercourses and other wet areas, and low (<3%) for the remainder of the project. Water erosion risk in the project area varies from low (<3%) to moderate - high risk (50-70%). Wind erosion risk in the project area is moderate -10-30% of the project is at risk of wind erosion. Correspondence from the Soil and Land Commissioner has identified a risk of soil erosion resulting from the project, due to steepness of batters and design of table drains. Typical measures to reduce the flow velocity and subsequent risk of soil erosion are listed below: • Economical channel lining (i.e. use of vegetation or rock). • Off-shoot drains, levees and table drain blocks where practical. • Appropriate sized culvert openings with the provision of wingwalls, headwalls, cut off walls, aprons and rock protection at the outlet when warranted. • Provision of energy dissipating structures where required. • Reduced channel grades where economically practicable. Land degradation factors will be taken into account during detailed design. The project will be designed to the relevant standards, including: • Austroads Guide to Road Design (AGRD) Part 5 and 5B • MRWA Supplement to AGRD Part 5 and 5B • Water Quality Protection Note 44: Roads Near Sensitive Water Sources • Detailed Geotechnical Information The project is not likely to be at variance with this principle.
Methodology	DAFWA Risk Mapping Shapefiles

(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	**Proposal may be at variance to this Principle**
	The nearest conservation reserve to the project is Morangup Reserve; a Class A reserve directly adjacent to the proposed widening. This reserve occurs on both sides of the road reserve from SLK 16.77 to SLK 17.3 and one side only from SLK 17.3. The project design was amended to prevent any clearing inside the reserve; however some edge effects could be expected due to the narrowness of the road reserve at this location. A large section of the Morangup Reserve was identified as dieback infected, from SLK 16.7 to SLK 17.75 on the north side of Toodyay Road (Appendix F). To the east of this location and upon a ridge, the Morangup Reserve was identified as dieback protectable. Main Roads has amended the project design to including drainage features that will channel water coming off the road away from the protectable location and prevent impacts to the uninfested vegetation. The project may be at variance to this Principle due to indirect impacts.
Methodology	Project design DPaW shapefiles Dieback Assessment (2016)

(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	**Proposal is not likely to be at variance to this Principle**
	Surface Water The vegetation around the surface water bodies in the project area is generally in Degraded to Completely Degraded condition, as a result of past road building and agricultural activities in the region. Very little native vegetation will be cleared at these locations, approximately 1.96 ha of riverine vegetation in Degraded to Completely Degraded condition. Main Roads has obtained a Bed and Banks Permit for these locations. Waterways in the project area were identified as being significant to the heritage of indigenous persons, and a s18 consent will be obtained for the project. The replacement of any bridges and culverts will be undertaken in a manner so as to prevent further impacts to the waterways and water flow. Main Roads will consider revegetation of these riparian sites, where road width and adjacent land uses are compatible with a favourable outcome. Up to 1.573 ha of wetland vegetation will be cleared for the project. **Ground Water** The project is not expected to significantly impact groundwater. No groundwater extraction is planned. Potentially contaminating activities such as hydrocarbon storage will be managed as part of the EMP. The project is not likely to be at variance to this principle.
Methodology	AECOM (2016a) DoW and DPAW shapefiles Goode (2016)

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

Comments	**Proposal is not at variance to this Principle**
	The project runs parallel to distributaries of the Swan River in a number of places, these areas have a high flood risk (>70%). The rest of the project has a low flood risk (<3%). The project is not in a flood prone location and therefore is not considered likely to cause or exacerbate flooding. The project is not at variance to this principle.
Methodology	DAFWA Risk Mapping Shapefiles

4. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The project was determined by DotEE to be a 'Controlled Action' under the *Environment Protection Biodiversity Act* 1999 (EPBC Act) (EPBC referral no. 2016/7665) due to impacts on threatened plants and communities.

A copy of the correspondence from the DotEE is provided in Appendix D.

Table 3 details an assessment of the project against matters NES.

Table 3: Assessment of Existing Environment, Matters of NES and Likely Impact.

Matter of NES	Existing Environment and Likely Impact
Nationally	Two Threatened species were identified in the project area; Carnaby's Black

listed threatened species or ecological communities	Cockatoo (*Calyptorhynchus latirostris*) and Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksii* subsp. *naso*). Baudin's Black Cockatoo (*Calyptorhynchus baudinii*), and Chuditch (*Dasyurus geoffroii*) were also considered likely to occur.
Justification of likely impact	The project is located within the known breeding range of Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), and one breeding Carnaby's Black Cockatoo pair was observed in a hollow within the larger survey area. The project will avoid this hollow. Forest Red-tailed Black Cockatoos (*Calyptorhynchus banksii* subsp. *naso*) were also recorded in the project area. Black Cockatoo roosting habitat is generally found in or near riparian vegetation, close to fresh water and typically is comprised of the tallest trees in these areas (DSEWPaC, 2012a). The majority of the project is within 50 m of freshwater wetlands, rivers or dams, however no confirmed roosting trees were observed in the survey area. A survey of Black Cockatoo potential breeding trees was also undertaken for the project. 7300 potential breeding trees were recorded in the spring surveys, as defined in the *Referral guidelines for three threatened black cockatoo species*. No more than 1360 black cockatoo trees will be cleared for the project, accounting for 18.6% of the trees recorded in the survey area. Of these no more than 94 with hollows will be cleared. It is expected that up to 50% of the trees with hollows in the project area are suitable for current use. Further impacts to Black Cockatoos will be managed in the project EMP by only clearing breeding trees with hollows outside the breeding season wherever possible. Where this is not possible, an assessment of hollows will be made and birds relocated (see EMP). Carnaby's Black Cockatoo feed on seeds, nuts and flowers of a variety of native and exotic plants. Feed plants include the various proteaceous species (e.g. Banksia, Grevillea and Hakea), *Corymbia calophylla* (Marri), Eucalyptus (e.g. Jarrah [*Eucalyptus marginata*]), and seeds from the cones of Pine trees (Pinus sp.). Up to 33 ha of foraging for Carnabys Black Cockatoos will be cleared for the project, of which 59.8% is in Degraded or Completely Degraded condition (Keighery 1994) and 40.2% is in Good or better condition. Red-tailed Black Cockatoos predominantly feed in eucalypt forests, preferring Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) seeds, but also feeding in Blackbutt (*Eucalyptus patens*), Albany Blackbutt (*Eucalyptus staeri*), Karri (*Eucalyptus diversicolor*), Sheoak (*Allocasuarina fraseriana*) and Snottygobble (*Persoonia longifolia*) (Johnstone, 2016 pers. comm.). Up to 6 ha of foraging for the Red-tailed Black Cockatoo will be cleared for the project, 99.9% of which is in Good or better condition. Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) was not recorded during the field survey. Differentiating between Baudin's Black Cockatoo and Carnaby's Black Cockatoo can be difficult in the field, particularly when the birds aren't viewed closely. It is possible that some of the Carnaby's Black Cockatoo records may have been Baudin's Black Cockatoo. Up to 29.5 ha of foraging habitat suitable for Baudins Black Cockatoo will be cleared, 58% of which is in Degraded or Completely Degraded condition, 42% in Good or better condition.

	Chuditch (*Dasyurus geoffroii*), listed as Vulnerable under the EPBC Act and WC Act, was also considered likely to occur. Formerly the Chuditch occurred over nearly 70% of the Australian continent from Western Australia across to Queensland, New South Wales and Victoria (DEC, 2012a). Currently the Chuditch only occurs in areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck & Strahan, 2008). The majority of records are found in the contiguous Jarrah forests of Southwestern Australia (DotEE, 2015). The species is thought to occur in the local area from four records within seven kilometres, the most recent in 2009. A targeted Chuditch survey was undertaken in late 2016 (AECOM 2016b). No indirect evidence of the Chuditch was recorded along transects in any of the vegetation units/habitats searched and no Chuditch were recorded in the project area in camera traps (See Appendix B). No more than 32.5 ha suitable for Chuditch will be removed for the project. Appendix A includes an assessment of the project against the conservation advice (TSSC 2015) for the Wheatbelt Woodland Threatened Ecological Community. Based on this assessment, the project will remove approximately 10 ha of woodland that meets the TEC requirements.
Methodology	DotE Protected Matters Search Report. EPBC Act referral guidelines for three threatened black cockatoo species AECOM 2016a AECOM 2016b

Migratory species	One Migratory species was recorded in the project area; Rainbow Bee-eater (*Merops ornatus*). Three other migratory species were also considered likely to occur: • Common Sandpiper (*Actitis hypoleucos*) • Fork-tailed Swift (*Apus pacificus*) • Eastern Great Egret (*Ardea modesta*)
Justification of likely impact	The Rainbow Bee-eater was recorded flying over the Project area at four locations. The Rainbow Bee-eater is a common species which occupies numerous habitats including open woodlands with sandy loamy soil, sand ridges, sandpits, riverbanks, road cuttings, beaches, dunes, cliffs, mangroves and rainforests. The Rainbow Bee-eater avoids heavy forest that would hinder pursuit of its insect prey (Morcombe, 2003). The Rainbow Bee-eater is a widespread species found all over Australia that has been previously recorded in the area (AECOM, 2016a). This species can be expected to occur throughout the majority of the project area, utilising sandy/loamy soils for breeding and elsewhere for feeding on insects. Significant impacts are not expected as the project area is not critical habitat for this migratory species. The Common Sandpiper is widespread throughout Australia, with few important sites on the continent. These birds visit Australia during the non-breeding season (July to February). Preferred habitat is coastal wetlands with muddy margins or rocky shores but it has also been recorded in inland wetlands and dams (DotE, 2015). The Common Sandpiper has been recorded nine times within seven kilometres of the survey area, most recently in 2011 (AECOM, 2016a). This species may be expected to occur sporadically within the project area in the river and wetland habitats. Impacts are not expected to be significant. The Fork-tailed Swift is a regular summer migrant to Australia, arriving in

	October and leaving by mid-April. It is generally observed flying high overhead, over open country, semi-arid deserts to coasts and forests (Pizzey & Knight, 2007). The Fork-tailed Swift was last recorded in 2000 within seven kilometres of the survey area (AECOM, 2016a). This species was not observed during the field survey and is unlikely to be supported by any of the habitats within the project area. The Great Egret occupies a wide variety of wet habitats including freshwater wetlands, dams, flooded pastures, estuarine mudflats, mangroves and reefs (Morcombe, 2003). The species is also known to visit shallows of rivers, sewage ponds and irrigation areas (Pizzey & Knight, 2007). Based on numerous recent records from 2013 within seven kilometres of the survey area (AECOM, 2016a), it is likely to occur sporadically in the river and wetland habitats of the project area. Impacts are not expected to be significant.
Methodology	AECOM 2016a DotE Protected Matters Search Report.

Wetlands of International Importance	None
Justification of likely impact	n/a
Methodology	DotE Protected Matters Search Report.

World Heritage Properties	None
Justification of likely impact	n/a
Methodology	DotE Protected Matters Search Report.

National Heritage Places	None
Justification of likely impact	n/a
Methodology	DotE Protected Matters Search Report.

Commonwealth Land or Marine Areas	None
Justification of likely impact	n/a
Methodology	DotE Protected Matters Search Report.

Nuclear Actions	Not relevant to the proposed activity.
Justification of likely impact	No project actions involve nuclear actions. Therefore no project impact on this matter.
Methodology	DotE Protected Matters Search Report.

Water Resource	Not relevant to the proposed activity.
Justification of likely impact	No project actions involve a water resource, only minor waterways. Therefore no project impact on this matter.
Methodology	DotE Protected Matters Search Report.

5. SUMMARY OF BIOLOGICAL SURVEYS

Both Metropolitan and Wheatbelt sections of Toodyay Road were surveyed by AECOM Pty Ltd in spring 2015. This included a fauna assessment plus targeted survey for Black Cockatoos. Significant trees, foraging and roosting habitat were targeted as per the referral requirements (DSEWPaC 2012). A flora assessment was also undertaken to identify threatened and priority flora species, vegetation type and condition, and map ecological communities.

The initial spring survey area included Toodyay Road for both Wheatbelt and Metro regions.

Results of the survey include:

- Three Threatened fauna species were recorded during the field surveys, including the Endangered Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Vulnerable Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii* subsp. *naso*) and the Marine listed Rainbow Bee-eater (*Merops ornatus*).
- Seven other conservation significant fauna species have been assessed as likely to utilise habitats within the survey area, although they were not recorded during the survey. These included Baudin's Black Cockatoo (*Calyptorhynchus baudinii*), Chuditch (*Dasyurus geoffroii*), Common Sandpiper (*Actitis hypoleucos*), Fork-tailed Swift (*Apus pacificus*), Eastern Great Egret (*Ardea modesta*), Western Brush Wallaby (*Macropus irma*) and Peregrine Falcon (*Falco peregrinus*)·
- Nine fauna habitats were mapped within the survey area, these comprised Eucalypt Woodland, Native Shrublands, Heath, Wetland, Planted Vegetation, Rehabilitation, Isolated Trees, River and Cleared.
- 7,235 potential Black Cockatoo breeding trees were recorded in the survey area, containing 278 potentially suitable hollows.
- 90 ha of native vegetation was considered to represent 'Good' quality foraging habitat for Carnaby's Black Cockatoo.
- 82 ha of native vegetation was considered to represent 'Good' quality foraging habitat for the Forest Red-tailed Black Cockatoo.
- Two A Class nature reserves, including Morangup Nature Reserve and one unnamed Recreational Area.
- Two pre-European vegetation associations (Beard 1981) and three Heddle et al. (1980) vegetation complexes are below the 30% threshold for concern.
- Five vegetation communities are considered significant as they support populations of Priority flora species. Furthermore, an additional two communities are significant as they support a unique composition of species in Morangup Nature Reserve.
- Four Declared Pest species were recorded within the survey area including two flora species, Bridal Creeper (*Asparagus asparagoides*) (also a Weed of National Significance) and Narrow Leaf Cotton Bush (*Gomphocarpus fruticosus*). Two pest fauna species, Rabbit and Fox, were recorded.
- Multiple waterways intersect the survey area, including Avon River and Susannah Brook.
- Vegetation mapping showed 22 distinct vegetation communities, including nine Eucalypt woodlands, eight wetlands, one heath community and four disturbed/degraded communities. Of these, five are considered significant (CcXpHh, EaXpBe, EdBn, EwBsLp and EwGtAl) as they support populations of Priority flora.
- Seven Priority flora species were recorded during the Spring 2015 surveys:
    - *Boronia scabra* subsp. *condensata* (Priority 2)

- o *Calytrix oncophylla* (Priority 2)
- o *Grevillea candolleana* (Priority 2)
- o *Caladenia integra* (Priority 4)
- o *Hibbertia montana* (Priority 4)

After liaising with DPaW, an additional survey was undertaken in February 2016 for the Wheatbelt section of Toodyay Road. This was to survey areas that were added to the project after the 2015 survey, and to provide additional data as per DPaW requirements regarding rare and priority flora. Additional data provided included the exact population counts of priority flora in the project area, as well as clarification on the absence or presence of the Threatened Ecological Community Woodlands of the Wheatbelt, which was listed in late 2015. Due to an extremely dry summer, the February 2016 survey did not provide robust enough data and many priority plant species were not able to be identified.

An additional spring survey was commissioned for 2016, to provide more robust flora population counts, survey additional areas added to the project design since February 2016, and address habitat data for Red-tailed Black Cockatoos that was missing from the original report. This second survey was for the Wheatbelt section of Toodyay Road only.

The significant findings from this survey include:

- Additional records of Priority flora at both known populations and new populations as follows:
  - o *Boronia scabra* subsp. *condensata* - one new population
  - o *Grevillea candolleana* - three new populations
  - o *Hibbertia montana* - one new population.
- Mapping of Threatened Ecological Community Woodlands of the Wheatbelt. A total of 14.3 ha was recorded in the surveyed area.

Main Roads also commissioned a Chuditch targeted survey for spring 2016 to determine the presence and value of the project area to this species. A memo of survey results has been provided, with the report to follow in January. No Chuditch or evidence of Chuditch was identified in the survey.

6. STAKEHOLDER CONSULTATION

Main Roads invited submissions from specified stakeholders in February and May 2016. Table 2 identifies the stakeholders who were contacted regarding the impacts of the proposed clearing associated with the project.

Table 2: Summary of Submissions Received from Stakeholders

Agency	Submission Received
Shire of Toodyay	No
Conservation Council WA	No
Conservation Commission of WA	Yes
Department of Water	No
Soil and Land Conservation Commission	Yes
Wildflower Society	Yes
Roadside Conservation Committee	No

Copies of the submissions are included in Appendix C.

6.1 Indigenous Consultation

The project was surveyed for Aboriginal archaeological and ethnographic significance, with both the Ballardong and Whaduk groups attending the ethnographic survey. A number of recommendations were made which have been taking into account during project development where possible.

7. SOCIAL AND ECONOMIC COSTS AND BENEFITS

The project will employ 30-50 people and is expected to be constructed in stages, as funding permits. The total cost will be approximately $66.9 million.

The project will increase safety, which is the main impetus; however will also increase freight efficiency and support development in the surrounding region. Congestion is expected to be reduced by 20-50%, safety improved by 10 to 39% (RPS, 2016). It is expected that road fatalities could reduce by up to 60% with the installation of passing lanes. Additionally, a study by the Bureau of Infrastructure, Transport and Regional Economics of 128 road and rail projects in Australia found that the economic return was $2.65 for every $1 invested (RPS, 2016).

The State Government estimates that the Shire's population will increase to approximately 5,750 residents by 2031 which represents an increase of 23.9% from 2014 (RPS, 2016). In 2013/2014, there were 2,540 vehicles per day on Toodyay Road west of Dryandra Road, and 2,000 vehicles per day north of Fernie Road, and between 218 and 348 heavy vehicles per day. An improvement to safety is a key driver and will remain an important issue as the population rises and traffic volumes increase.

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. An Environmental Management Plan has been prepared for this project.

9. REFERENCES

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Appendix A

Biological Assessment

Appendix B

Targeted Chuditch Survey

Appendix C

Stakeholder Submissions

Good afternoon Rochelle,

On 9 May you invited comment about the proposed land clearing to facilitate road safety upgrades on sections of these roads.
Your environmental risk assessment largely focusses on potential biodiversity impacts. Therefore, I did not provide advice on these matters that are outside of DAFWA's responsibilities.

I would however, like to draw your attention to the likelihood of increased soil erosion if these works are implemented.
The grades on the Toodyay road are probably upto 15% for short sections and 4-5% on the other two roads. Soil erosion is evident in the table drains on some sections and I am concerned that the proposed road upgrades will increase the risk of soil erosion.

Working from first principles, the safe maximum velocity for run-off water in a bare earth channel will be in the 0.5 to 1.2 m/s range, depending upon soil type.

The running surface of the road, shoulder and batters generate run off. The threshold for run off is probably less than 5mm of RF.
Table drains associated with these roads are invariably of V shaped cross section.
V shaped channels result in high velocity flows.

From a soil erosion perspective, the safe grade for this type of channel will vary with length of run and amount of run off to be managed (ie spacing between spur drains or culvert) and soil type. The following are a rough guide for clay soils:

Eg : <20m	1.5%
20-50m	1%
50-100m	0.6%
100-200m	0.5%
200-300m	0.4%

Much of the road to be upgraded in this proposal will fall within these grades and it is recommended that the table drains be designed to safely carry the expected increased flows without causing accelerated soil erosion.

I have noticed that where roads have been upgraded in recent years, the soil erosion risk has increased due to both increased batter areas, increased running surface area and reduced numbers of spur drains constructed. Has there been a change in standards or the best practice road design manual, or is soil erosion risk being overlooked in the planning and construction phases?

Regards

Andrew Watson | Commissioner of Soil and Land Conservation
Biosecurity and Regulation
Department of Agriculture and Food, Western Australia
3 Baron-Hay Court, South Perth WA 6151
t +61 (0)8 9368 3282 | **f** +61 (0)8 93683355 | **m** +61 (0)429 885 662
w agric.wa.gov.au

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WILDFLOWER SOCIETY OF WESTERN AUSTRALIA (Inc)

27th June 2016

Rochelle Lupton
Environment Officer - Wheatbelt
Main Roads Western Australia
Northam Office
PO Box 333
NORTHAM WA 6410

Sent by email to rochelle.lupton@mainroads.wa.gov.au

To Rochelle,

Subject: Toodyay Road Widening and Improvement Works

Thank you for requesting our feedback on this project.

At this early stage, we do not really have the information necessary to provide detailed feedback. As a minimum we would need to see the baseline flora and vegetation report (Aecom, 2015-2016). The information that has been provided to us in the form of the Variance to Clearing Principles form is by your own admission incomplete. It is not comprehensive enough to make a judgment. We really need to see the technical reports and the final alignment including vegetation mapping etc.

You state that you are not sure whether the "Eucalypt Woodlands of the WA Wheatbelt" Threatened Ecological Community (TEC) is present, yet you state that *"approximately 50% of the project is in Vegetation Associations 4 and 352"*. Then you state that association 352 is "Medium Woodland: York Gum". If that is the case then it is highly likely that any remnant vegetation in areas mapped as 352, does represent the TEC. Without more information about distribution and condition on vegetation however, we cannot really comment.

PO BOX 519, FLOREAT WA 6014 TELEPHONE (08) 9383 7979
email: wildflowers@ozemail.com.au website: www.ozemail.com.au/~wildflowers

One thing is clear from what has been provided, that several matters are likely to be at variance with the Clearing Principles. As an organisation, generally speaking we will not support projects that are at variance with the Clearing Principles. There is a reason why that legislation was brought in. We also do not support offsets as a recompense for loss of intact native vegetation, even in normal circumstances. Over and above that, we most definitely cannot support offsets in the Wheatbelt bioregion, where so little intact vegetation remains.

All that being said, we have not been given sufficient information, particularly about the condition, type and distribution of the remnant vegetation to be able to make a balanced judgement.

We suggest that the Variance to Clearing Principles table address the Jarrah Forest and the Wheatbelt components separately. As you are probably aware, the WA Wheatbelt is a special case in that well under 10% of native vegetation is thought to remain. It is one of the most cleared bioregions in Australia, if not the most. And much of that remnant vegetation only occurs on roadsides. Attempting to discuss the Jarrah Forest and Wheatbelt bioregions all jumbled up in one table will not make for easy interpretation.

We can only suggest that for the clearing permit process, that you provide clear and comprehensive technical information. Quality information. Spending more time than should necessary trying to interpret poor quality information is a guaranteed way of antagonising everyone that relies on that information to make informed decisions. Which is obviously not in the interests of MRWA.

Again, we thank you for seeking our opinion on this matter. Should you require any further information please contact Brian Moyle on (08) 9330 1754 or at moyleb@bigpond.com.

Yours sincerely,

Brian Moyle

Brian Moyle
Chair Conservation Subcommittee

Government of Western Australia
Conservation Commission

Conservation
WESTERN AUSTRALIA

Rochelle Lupton
Environment Officer
Main Roads WA-Wheatbelt
PO Box 333
NORTHAM WA 6401

COPY

Enquiries: Carol Shannon, DIRECTOR
Conservation Commission
Tel: 9219 9976
Carol.Shannon@conservation.wa.gov.au

Copy to Kelly Faulkner, Executive Director, Licensing and Approvals, Department of Environment and Regulation

Dear Ms Lupton

TOODYAY ROAD WIDENING AND IMPROVEMENT WORKS: CPS 818/12

Thank you for your letter dated 23 February 2016 (enclosed correspondence). I understand that Main Roads is seeking the Conservation Commission of Western Australia's (Conservation Commission) input as part of conditions for the clearing of native vegetation under CPS 818/12 (the Clearing Permit, enclosed). The Commissioner of Main Roads Western Australia is the holder of the Clearing Permit valid from 12 December 2005 – 30 June 2018.

By Condition 7 of the Clearing Permit (a) the Permit Holder must invite submissions from parties—including (iii) the owner (as defined in section 51A of the *Environmental Protection Act 1986* (EP Act), or occupier (as defined in section 3 of the EP Act), of any land on which the clearing is proposed to be done—about those impacts of the proposed clearing that are likely to be seriously at variance, at variance, or may be at variance with one or more of the clearing principles.

According to the enclosed correspondence, an initial assessment of the project found that the proposed clearing is "likely to be at variance" to Principle (a) Native vegetation should not be cleared if—(a) it comprises a high level of biological diversity; and Principle (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; and "is also at variance" to Principle (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. The enclosed correspondence outlines the following impacts:

- clearing of up to 58 ha of native vegetation including Vegetation Association 4 "Medium Woodland: Marri and Wandoo" and Vegetation Association 352 "Medium Woodland; York gum;
- two Priority Flora species recorded in the area *Grevillea candolleana* and *Hibbertia montana;*
- the proposal area is within the known breeding range of Carnaby's black cockatoo and Forest Red-tailed Black Cockatoos;
- an estimated 13.58 ha of Cockatoo habitat within the project area;
- a total of 7,265 potential breeding habitat trees, 1,304 within the project clearing area and expected to be removed; including 440 trees with hollows ("89 of these are present in the project area");
- potential impact to Chuditch habitat;
- potential impact to Western Brush Wallaby habitat; and
- crossing a number of tributaries of the Swan River.

Block 11, 17 Dick Perry Avenue, Kensington WA 6151
Website: www.conservation.wa.gov.au

The Service Unit of the Conservation Commission appreciates the opportunity to provide comment as part of Main Roads processes to comply with the Clearing Permit and most importantly by virtue of the proximity of the clearing to lands vested in the Conservation Commission under the *Conservation and Land Management Act 1984* (the CALM Act). In this regard, although not identified in the enclosed correspondence, I note the relevance of Principle (h) which states that 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.[1] In this case, nearby conservation areas include the Avon Valley National Park, Morangup Nature Reserve and Woondowing Nature Reserve.

In the absence of information referred to in Condition 7 (d)[2], specifically—(i) a description of the manner in which the Permit Holder has complied with Condition 5 of the Clearing Permit; (ii) a description of the land on which the clearing is to be done; (v) the boundaries of the clearing required for project activities recorded on a map; (vi) the manner the Permit Holder considers that the clearing is likely to be seriously at variance, at variance or may be at variance with one or more of the clearing principles; and (vii) an outline of any rehabilitation, revegetation, or Vegetation Management Plan—the Service Unit of the Commission can only refer to the management objectives articulated in the CALM Act.

I particularly draw your attention to the objectives that the Conservation Commission shall have for achieving or promoting the purpose of Nature Reserves and National Parks under the CALM Act[3] (in this case Morangup Nature Reserve, and the Avon Valley National Park):

- in the case of **national parks** and conservation parks, to fulfil so much of the demand for recreation by members of the public as is consistent with the proper maintenance and restoration of the natural environment, the protection of indigenous flora and fauna and the preservation of any feature of archaeological, historic or scientific interest;
- in the case of **nature reserves** to maintain and restore the natural environment, and to protect, care for, and promote the study of, indigenous flora and fauna, and to preserve any feature of archaeological, historic or scientific interest; and

I also note the Conservation Commission's objective of protecting and conserving the value of the land to the culture and heritage of Aboriginal persons (see CALM Act s56(2)). Thank you for the opportunity to provide comment in accordance with relevant instruments under the EP Act. Please do not hesitate to contact me on 9219 9976 should you have any queries.

Yours sincerely

Carol Shannon—Director
Conservation Commission
23 March 2016

[1] By Schedule 5 of the *Environmental Protection Act 1986* a "***conservation area*** means a conservation park, national park, nature reserve, marine nature reserve, marine park or marine management area within the meaning of the *Conservation and Land Management Act 1984* or any other land or waters reserved, protected or managed for the purpose of, or purposes including, nature conservation."
[2] See Condition 7 (d) of CPS 818/12 available through der.wa.gov.au
[3] See CALM Act s56

Appendix D

Correspondence from Department of the Environment (EPBC referral)

Australian Government
Department of the Environment

EPBC Ref: 2016/7665

Mr Ardeshir Bahmani
Project Manager
Main Roads (Western Australia)
PO Box 333
NORTHAM WA 6401

Dear Mr Bahmani

Decision on referral
Toodyay Road widening and upgrade project, Western Australia

Thank you for submitting a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This letter is to advise you of my decision on the referred action to widen and upgrade Toodyay Road between the straight line kilometres 12.71 and 40.14, in the Shire of Toodyay, Western Australia.

As a delegate of the Minister for the Environment, I have decided under section 75 of the EPBC Act that the proposed action is a controlled action and, as such, it requires assessment and a decision about whether approval for it should be given under the EPBC Act.

The information that I have considered indicates that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- Listed threatened species and communities (section 18 & 18A).

Based on the information available in the referral, the proposed action is likely to have a significant impact on the following matters of national environmental significance, but not limited to:

- The proposed action is likely to significantly impact the endangered Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*),vulnerable Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*), and vulnerable Baudin's Black-Cockatoo (*Calyptorhynchus baudinii*)
- The proposed action has the potential to significantly impact the vulnerable Chuditch (*Dasyurus geoffroii*), and the critically endangered Eucalypt Woodlands of the Western Australian Wheatbelt threatenend ecological community.

Please note that this decision only relates to the potential for significant impacts on matters protected by the Australian Government under Chapter 2 of the EPBC Act.

A copy of the document recording this decision is enclosed.

At this stage, a decision has not been made on the approach that must be used to assess the project. To assist in determining the most appropriate assessment approach the Department will be contacting the WA Department of Environment

GPO Box 787 Canberra ACT 2601 • Telephone 02 6274 1111 • Facsimile 02 6274 1666
www.environment.gov.au

Regulation to confirm whether the assessment bilateral agreement between the Commonwealth Government and the WA Government will be applied to this proposal.

Please note, under subsection 520(4A) of the EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2000* your assessment is subject to cost recovery. A fee schedule will be provided to you once the decision on the assessment approach has been determined. Further details on cost recovery are available on the Department's website at: http://www.environment.gov.au/epbc/cost-recovery.

You may elect under section 132B of the EPBC Act to submit a management plan to be considered during the assessment at any time before an approval decision is made. If a management plan is submitted or revised after approval it may incur additional fees under cost recovery. Please refer to Attachment A for more details.

The Department considers that your project may be suitable for the application of outcomes-based conditions in accordance with the draft *Outcomes-based Conditions Policy 2015*. The Department may seek further information through the assessment process to allow outcomes-based conditions to be applied, in the event that your project is approved with conditions. Please call your project manager if you wish to discuss what outcomes-based conditions involve, or if you are concerned about your capability and willingness to comply with outcomes-based conditions

Please also note that once a proposal to take an action has been referred under the EPBC Act, it is an offence under section 74AA to take the action while the decision making process is on-going (unless that action is specifically excluded from the referral or other exemptions apply). Persons convicted of an offence under this provision of the EPBC Act may be liable for a penalty of up to 500 penalty units. The EPBC Act is available on line at: http://www.environment.gov.au/epbc/about/index.html

The Department has recently published an *Environmental Impact Assessment Client Service Charter* (the Charter) which outlines the Department's commitments when undertaking environmental impact assessments under the EPBC Act. A copy of the Charter can be found at: http://www.environment.gov.au/epbc/publications/index.html.

If you have any questions about the referral process or this decision, please contact the project manager, Justin Williams, by email to justin.williams@environment.gov.au, or telephone (02) 6275 9492 and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

Bruce Edwards
Assistant Secretary
Assessments (WA, SA, NT) and Air Branch
8 April 2016

2

Australian Government
Department of the Environment

Notification of
REFERRAL DECISION AND DESIGNATED PROPONENT – controlled action
Toodyay Road widening and upgrade project, Western Australia
(EPBC 2016/7665)

This decision is made under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

proposed action	To widen and upgrade Toodyay Road between the straight line kilometres 12.71 and 40.14, in the Shire of Toodyay, Western Australia [See EPBC Act referral 2016/7665].
decision on proposed action	The proposed action is a controlled action. The project will require assessment and approval under the EPBC Act before it can proceed.
relevant controlling provisions	• Listed threatened species and communities (sections 18 & 18A)
designated proponent	Main Roads ABN: 50 860 676 021
assessment approach	To be advised.
Decision-maker	
Name and position	Bruce Edwards Assistant Secretary Assessments (WA, SA, NT) and Air Branch
Signature	
date of decision	8 April 2016

Appendix E

Bed and Banks Permit

File No: RF4119-03

Government of Western Australia
Department of Water

Instrument No. PMB183007(1)

PERMIT TO OBSTRUCT OR INTERFERE (S17)

Granted by the Minister under section 17 of the Rights in Water and Irrigation Act 1914

Permit Holder(s)	Main Roads	
Description of Water Resource	Avon River Catchment Avon River Catchment	
Location of Water Source	Toodyay Road - SLK 12.71 to SLK 40.14	
Authorised Activities	**Activity**	**Location of Activity**
	Modification of Toodyay Road by widening and putting in passing lanes, including clearing of vegetation and upgrading or replacing bridges and culverts	Toodyay Road - SLK 12.71 to SLK 40.14
Duration of Permit	From 14 July 2016 to 30 November 2018	

This Permit is subject to the following terms, conditions and restrictions:

1 The permit holder shall ensure that the proposed works does not act as an artificial barrier or levee, causing water to pond upstream.

2 The permit holder must undertake the works authorised by this permit with minimal disturbance to vegetation and the bed and banks.

End of terms, conditions and restrictions

This Permit is granted subject to the Rights in Water and Irrigation Regulations 2000

Appendix F

Dieback Assessment

Appendix G
Environmental Management Plan
TOODYAY ROAD WIDENING SLK 12.75 TO 40.30

Introduction
This Environmental Management Plan (EMP) has been developed for the project following the completion of the Impact Assessment and Matters of National Environmental Significance (MNES) Report. The aim of this EMP is to minimise the environmental impacts associated with the proposed works as well as to identify areas of responsibilities required for the implementation of management strategies. This EMP includes vegetation management measures.

This EMP addresses specific issues that were identified during the impact assessment. The project management measures identified within this EMP are in addition to the standard environmental management contract specifications used for Category 2 projects. Main Roads' standard environmental contract specifications (Specifications 203, 204, 301, 302 and 304) are to be adhered to where appropriate.

The areas that require special management will be addressed in terms of:

- the timing of the management actions;
- the topic (e.g. vegetation);
- the actions that are necessary to minimise the impact; and
- the responsible party for implementing the action.

Communication Plan
Environmental issues specific to the Wheatbelt and the project will be communicated as follows:

Method	Frequency	Participants	Record
Induction	Prior to construction	Project Personnel	Induction records
JSEA	Prior to construction	Project Personnel	JSEA paperwork
Toolbox Meetings	Weekly	Project Personnel	Minutes of Meeting
Prestart Meetings	As required	Project Personnel	Minutes of Meeting
Department of Environment Regulation	As required	Main Roads' Project Manager and Contractor Project Manager	Minutes of meeting

External Communication and Complaints
A complaints register shall be maintained. All complaints received shall be forwarded to the Main Roads' Project Manager for action. Serious complaints shall be investigated within 24 hours of the complaint being received.

Contingency Measures
Should any significant non-conformance issues arise, the appropriate Department will be notified and contingency measures discussed.

Auditing
Auditing will be undertaken for this project, and will include one (or several) of the following:

- Project Manager auditing compliance with this EMP based on the Compliance Checklist, which will be provided by the Environment Officer once all approvals are received and shall be based on this EMP, plus any additional measures required by the regulator/s.
- The project will also be audited by the Environment Officer at designated intervals as required in the EMP e.g. checking of the clearing line prior to clearing.
- Main Roads may choose to have the project audited by an external third party to ensure that any Contractor EMPs are compliant with approvals and permit conditions (desktop audit) , or to ensure that construction activities are in compliance with approvals and permit conditions (on-ground audit).

EMP Accountability

Persons name	Persons Role	Contact details
Rochelle Lupton	Environment Officer	0435 042 502
Barry Hackett	Site Supervisor	08 9622 4717

ENVIRONMENTAL MANAGEMENT PLAN				
Project Component	**Management Action**	**Record Keeping/ Monitoring**	**Responsible Person**	**Completion Timeframe**
Standard Record Keeping Management				
Record Keeping and Inductions	• Ensure standard record keeping requirements are completed within 1 month of completion of the project activities.	Post-construction record maintenance.	Site Supervisor	Within 1 month of completion of the project activities.
	• All construction crew will be inducted into the EMP and the crew trained to identify particular native fauna and flora. • Weekly toolbox will raise areas of concern, including dieback management procedures and no-go zones. • At prestart the requirements of the EMP will be reviewed with contractors. • Any tasks required by construction crew in relation to areas with Priority flora will be included in the JSA.	Induction notes and Toolbox meeting minutes and attendance records	Site Supervisor	Prior to works
Project Specific Aspects				
Vegetation	• The approved clearing boundary will be pegged to prevent impacts to adjacent Priority flora that are outside the limitations of clearing. • Priority flora within 5 m of the project will be flagged so as to prevent any accidental impacts. • Morangup Reserve will be pegged as a no-go area on the cadastral boundary. • The clearing area will be checked by the Environment Officer or Roadside Management Officer prior to commencement of clearing.	One surveillance monitoring will occur prior to clearing.	Site Supervisor Environment Officer	Prior to clearing commencing
	• Topsoil will be stockpiled and respread after works.	One surveillance monitoring will occur within two weeks once clearing has been completed.	Site Supervisor Environment Officer	Within two weeks once clearing has been completed
	• Mulched vegetation will be spread over the backslopes to retain seed bank.	One surveillance monitoring will occur within two weeks once clearing has been completed.	Site Supervisor Environment Officer	Within two weeks once clearing has been completed
	• Burning of cleared vegetative materials or burning within the road reserve shall not be permitted under any circumstances	One surveillance monitoring will occur within two weeks once clearing has been completed.	Site Supervisor	Within two weeks once clearing has been completed

ENVIRONMENTAL MANAGEMENT PLAN				
Project Component	**Management Action**	**Record Keeping/ Monitoring**	**Responsible Person**	**Completion Timeframe**
	• Revegetation will be undertaken where possible to improve water quality along waterways and replace vegetation removed for the project. This will be undertaken as part of yearly regional revegetation as funding permits and only in locations where the road reserve is wide enough for revegetation not to impact road safety.		Roadside Management Officer	As funding permits
	• Clearing activities must be completed in accordance with Main Roads Specifications: 204 (Environment), 301 (Clearing), 302 (Earthworks).		Site Supervisor	
Avoid and manage impacts to fauna.	• Fauna are not to be fed or intentionally harmed or killed.	Any fauna injured or killed on site will be recorded as an incident.	Site Supervisor Environment Officer	Project lifespan/ ongoing
	• In the event that sick, injured or orphaned native wildlife are found on the project site, the WILDCARE Helpline (08) 9474 9055) will be contacted for assistance.	Any sick, injured or orphaned native wildlife found on site will be recorded as an incident.	Site Supervisor	Project lifespan/ ongoing
	• Restrict movement of machines and other vehicles to the limits of the areas cleared.		Site Supervisor	Project lifespan/ ongoing
	• A 'soft start' will be implemented prior to clearing to allow animals in the area to move away before clearing activities commence.		Site Supervisor Environment Officer	Prior to clearing
	• The project area will be checked by a qualified ecologist prior to clearing. Mammals, echidnas, large terrestrial reptiles and nesting birds will be relocated outside the clearing area.	Relocation and monitoring records	Ecologist Environment Officer	Prior to clearing
Avoid and manage impacts to fauna -Black Cockatoos	• Clearing of trees with hollows suitable for current use by black cockatoos, will be undertaken outside breeding season (July to January) where possible. • If clearing cannot be undertaken outside breeding season, trees that have suitable hollows will be checked by a qualified ecologist and any chicks found will either be relocated, or the tree will remain so as to allow chicks to fledge before clearing. • If relocation is required, a Relocation Plan will	Relocation Plan (as required)	Site Supervisor Environment Officer Contractor	Project lifespan/ ongoing As required

ENVIRONMENTAL MANAGEMENT PLAN				
Project Component	**Management Action**	**Record Keeping/ Monitoring**	**Responsible Person**	**Completion Timeframe**
	be developed and approved by DPaW. Relocations will only be undertaken by a qualified ecologist with appropriate licences.			
Dieback and weed management.	• All equipment and machinery to arrive clean on site. • Drainage has been designed to prevent the spread of dieback around the Morangup Nature Reserve. Dieback control measures are to be discussed at weekly Toolbox so all staff understand the requirements around the reserve. • Dieback free zone to be marked with appropriate signage. • All vehicles must be clean upon entering the dieback free zone. • No vehicles are to go outside the approved clearing area for the project, so as to prevent the spread of dieback. • At the dieback free location, drains are to be constructed first so as to prevent any infection of the reserve from construction materials with uncertain dieback status. • Works are to be undertaken in the dry season for the dieback free zone where possible. • Weeds will be sprayed yearly as required. • Weed control will be included in revegetation undertaken on Toodyay Road.	Vehicle cleaning records Evidence of no go flagging and compliance during audit Toolbox meeting minutes Yearly weed spray program	Contractor Environment Officer Roadside Management Officer	Prior to mobilisation During works Yearly
Aboriginal Heritage Sites	• Ensure on-site construction personnel are aware of the location of the Heritage Sites and the requirement to report any artefacts if found. • In the event that human skeletal material is discovered, work will cease immediately and the Police will be contacted. If the skeletal remains are determined to be of Aboriginal origin, the Department of Aboriginal Affairs will be contacted as soon as practicable. • In the event that artefacts or material of Aboriginal origin is discovered, work will cease within 25 metres of the material and a qualified archaeologist will investigate the item(s) and take appropriate actions.	Incident reporting	Site Supervisor Contractor	Project lifespan/ Ongoing As required

ENVIRONMENTAL MANAGEMENT PLAN				
Project Component	**Management Action**	**Record Keeping/ Monitoring**	**Responsible Person**	**Completion Timeframe**
	• Impacts to waterways will be minimised as far as practicable.			
Waste and pollution	• All waste materials from the project area will be removed from the site upon completion of the project and to the satisfaction of the Project Manager or Site Superintendent. • Construction waste and other rubbish will be contained in bins with lids (where practicable) and removed regularly. • Written Pollution and wastage control measures and accidental response procedures are to be recorded.	Construction and post-construction maintenance Evidence of correct procedures at audit	Contractor	Completion of works
Hazardous Materials and Hydrocarbons	• Bulk fuel and hazardous material storage areas will be bunded and managed in compliance with applicable Australian Standards. • MSDS are to be on site. • Fuel pods are to be double bunded. Refuelling pods to be stored adequately overnight. Fuel can be stored offsite to prevent theft. • Regular vehicle servicing will be undertaken at designated areas, at least 50 m away from watercourses. • No refuelling within 50 m of the watercourse and refuelling will only be undertaken at the designated refuelling location by a person trained in refuelling. Refuelling activities must be covered by a SHEWMS. • Auto greaser to be set to correct setting so as not to drip grease. • Hydraulic hoses to be fastened to prevent risk of hydraulic hose tear. • Refuelling of stationary plant such as generators shall be undertaken in a mobile bunded area, or alternatively a bunded generator may be used. If refuelling of stationary equipment adjacent to the watercourse, this shall be done by hand with limited amounts of hydrocarbons to reduce the risk and impact of a spill.	Environmental Audit	Contractor Project Manager Environment Officer	Project lifespan

ENVIRONMENTAL MANAGEMENT PLAN				
Project Component	**Management Action**	**Record Keeping/ Monitoring**	**Responsible Person**	**Completion Timeframe**
	• Site personnel shall be trained in the use of emergency fire suppressant equipment. • Spill trays will be available near fuel storage or refuelling areas. Spill kits to be present with adequate supplies. • All hazardous material spills will be reported according to statutory requirements and to the Principal immediately. • Bunded area to be used for concrete washdown. • Hazardous materials will be disposed of at an approved and certified facility. • Temporary storage of bitumen, asphalt, concrete or aggregate shall occur at designated depots or controlled hardstands located within the project area, and not within 50 m of the watercourse. • Oxy-acetylene gas bottles securely stored • Diesel-fuelled power generators on site are self bunded			
Dust	• Surface watering, spreading of hydromulch or similar will be used to protect loose surfaces or cleared areas. • Apply dust suppression techniques to sealed roads on or near the project site that are affected by excessive dust. • Water tankers will be made available to dampen exposed surfaces within construction and laydown areas, particularly during ground disturbing activities. • Minimise or cease project activities during periods of high wind or when excessive dust is generated. • Apply water, road sweeping and signage for suitable speed limits during vehicle movements.	Audit Complaints register	Site Supervisor	During works
Surface Drainage	• Disturbed areas will be stabilised soon after construction activities are completed. Stabilisation will be undertaken using bunds, sediment traps or similar, as required. • Erosion and sedimentation control plans to protect sensitive areas are to be developed	Audit	Site Supervisor	During works

ENVIRONMENTAL MANAGEMENT PLAN				
Project Component	**Management Action**	**Record Keeping/ Monitoring**	**Responsible Person**	**Completion Timeframe**
	and measures installed prior to commencing with earthworks • • No on-site storage of fuel, oils and other contaminant materials will be permitted within 50 m of a watercourse or wetland. • Existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted during project construction. • Drainage, dams and waterways impacted by the works will be reconstructed as required. • Vehicle and equipment wash down areas will be located away from environmentally sensitive areas including the Morangup Nature Reserve and waterways • Works will be undertaken during the dry season where possible, so as not to impact surface water flows.			
Groundwater	• All chemical and/or hydrocarbon spills will be contained immediately and removed within 24 hours to minimise the potential for contaminants to enter groundwater.	Incident reports	Site Supervisor Environment Officer	As required
Fire	• No fires shall be lit within the project area. • Machinery will be fitted with approved spark arresting exhaust systems. • All vehicles, plant and equipment to be fitted with fire extinguishers and restricted to designated cleared areas. • All hot works will be undertaken in accordance with standard safety procedures • Construction personnel will extinguish and report fires occurring within the project area.	Incident Reports	Site Supervisor	During works

Figure 3 - Dieback free zone - Toodyay Road Widening SLK 12.75 to 40.3