GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8315/1
Permit Holder:	Commissioner of Main Roads Western Australia
Duration of Permit:	1 August 2019 to 1 August 2024

ADVICE NOTE
The funds referred to in condition 8 of this permit are intended for contributing towards the purchase of 3.81 hectares of native vegetation containing similar environmental values to the application area, being; habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*) and vegetation commensurate with the *Banksia* Woodlands of the Swan Coastal Plain threatened ecological community.

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

1. Purpose for which clearing may be done
Clearing for the purpose of road construction or upgrades.

2. Land on which clearing is to be done
Lot 1000 on Plan 13682, Murdoch and Leeming
Lot 50 on Plan 6977, Murdoch
Crown Reserve 39704, Murdoch

3. Area of clearing
The Permit Holder must not clear more than 0.72 hectares of native vegetation within the area cross-hatched yellow on attached Plan 8315/1.

4. Application
This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

5. Type of clearing authorised
This Permit authorises the Permit Holder to clear native vegetation for the activities described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for those activities under the *Main Roads Act 1930* or any other written law.

PART II –MANAGEMENT CONDITIONS

6. Avoid, minimise and reduce the impacts and extent of clearing
In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:
(a) avoid the clearing of native vegetation;
(b) minimise the amount of native vegetation to be cleared; and
(c) reduce the impact of clearing on any environmental value.

7. Dieback and weed management

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
(b) ensure that no *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

8. Monetary contributions to a fund maintained for the purpose of establishing or maintaining vegetation (offset)

Prior to undertaking any clearing authorised under this Permit and no later than 1 August 2020, the Permit Holder shall provide documentary evidence to the CEO that funding of $38,481 has been transferred to the Department of Water and Environmental Regulation for the purpose of establishing or maintaining native vegetation.

9. Wind erosion management

The Permit Holder shall not clear native vegetation unless development commences within three months of the authorised clearing being undertaken.

10. Fauna management – direction of clearing

The Permit Holder shall conduct clearing in a slow progressive manner towards surrounding remnant vegetation to allow fauna to escape the clearing activity.

PART III - RECORD KEEPING AND REPORTING

11. Records must be kept

The Permit Holder must maintain the following records for activities done in pursuant to this Permit:

(a) In relation to the clearing of native vegetation authorised under this Permit:
  (i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings;
  (ii) the date that the area was cleared; and
  (iii) the size of the area cleared (in hectares).
(b) Actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of the Permit.
(c) Actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 7 of the Permit.
(d) The date development commenced in accordance with condition 9 of the Permit;

12. Reporting

(a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
  (i) of records required under condition 11 of this Permit; and
  (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
(b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
(c) Prior to 1 May 2024, the Permit Holder must provide to the *CEO* a written report of records required under condition 11 of this Permit where these records have not already been provided under condition 12(a) of this Permit.

Definitions
The following meanings are given to terms used in this Permit:

CEO: means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

dieback means the effect of *Phytophthora* species on native vegetation;

fill means material used to increase the ground level, or fill a hollow;

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation; and

weed/s means any plant -

(a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
(b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or
(c) not indigenous to the area concerned.

Ryan Mincham
2019.07.02
16:33:21
+08'00'

Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under section 20
of the *Environmental Protection Act 1986*

2 July 2019

Plan 8315/1

Legend

CPS areas approved to clear

base layers

Road Centrelines

Cadastre

Local Government Authorities

Image

N

0 50 100 150 200 m

MGA 94
Geocentric Datum of Australia 1994

Ryan Mincham
2019.07.02
16:32:19 +08'00'

Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

GOVERNMENT OF WESTERN AUSTRALIA

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8315/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Commissioner of Main Roads of Western Australia
Application received date: 21 December 2018

1.3. Property details

Property: Lot 1000 on Plan 13682, Murdoch and Leeming
Lot 50 on Plan 6977, Murdoch
Crown Reserve 39704, Murdoch
Local Government Authority: City of Melville
Localities: Murdoch and Leeming

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.72		Mechanical Removal	Road construction and upgrades

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 2 July 2019

Reasons for Decision:

The clearing permit application was received on 21 December 2018 and has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986*, and it has been concluded that the proposed clearing is at variance to principles (a) and(b), and is not likely to be at variance to the remaining clearing principles.

It is considered that the proposed clearing will result in the following significant residual impacts:

- 0.7 hectares of Banksia Woodlands of the Swan Coastal Plain threatened ecological community (TEC); and
- 0.72 hectares of black cockatoo foraging habitat.

After consideration of the above impacts, the Delegated Officer determined that:

- The acquisition and conservation of 3.81 hectares of remnant native vegetation will counterbalance significant residual impacts to black cockatoo foraging habitat and the Banksia Woodlands of the Swan Coastal Plain TEC.

The Delegated Officer also determined that the proposed clearing may increase the spread of weeds and dieback into nearby vegetation and that the proposed clearing may cause appreciable land degradation in the form of wind erosion. Furthermore, the proposed clearing may impact on signficant habitat for ground dwelling fauna species.

To minimise the impact associated with weeds and dieback, a condition has been placed on the permit requiring the implementation of weed and dieback management measures. To minimise the impact of wind erosion, a condition has been placed on the permit requiring development to commence within three months of clearing. To minimise the impact to ground dwelling fauna, a condition has been placed on the permit requiring clearing to be undertaken in a slow progressive manner to allow fauna to move away from the clearing activity.

The Delegated Officer also took into consideration that upgrades to the road will provide a public benefit.

Given the above, the Delegated Officer decided to grant a clearing permit subject to dieback and weed management, wind erosion, fauna management and offset conditions.

2. Site Information

Clearing Description: The application to clear 0.72 hectares within Lot 1000 on Plan 13682, Murdoch and Leeming, Lot 50 on Plan 6977, Murdoch and Crown Reserve 39704, Murdoch, is for the purpose of upgrading approximately 650 metres of the Kwinana Freeway between Farrington Road and Fiona Stanley Hospital. The application area is indicated in Figure 1. The works anticipated for the project include:

- Widening of 650 metres of the Kwinana Freeway;
- Noise and screen walls and other structures;
- Drainage;
- Expansion of existing drainage basins;
- Installation of lighting;
- Modifications to principle shared paths, cycle paths and footpaths;
- Signs (static and electronic) and pavement markings; and
- Landscaping (MRWA, 2018).

The proposed road upgrade is to relieve peak time congestion, improve access to Fiona Stanley Hospital and support ongoing development of the Murdoch Activity Centre (MRWA, 2018).

Vegetation Description: The application area is mapped as Bassendean Complex-Central and South (44), which is described as "Vegetation ranges from woodland of *Eucalyptus marginata* (Jarrah) - *Allocasuarina fraseriana* (Sheoak) - *Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the moister sites. This area includes the transition of *Eucalyptus marginata* (Jarrah) to *Eucalyptus todtiana* (Pricklybark) in the vicinity of Perth" (Heddle and Havel, 1980).

The field survey conducted by AECOM (2010) during September and November 2009, and April 2010, identified the following vegetation types occurring within the application area;

- **BAtS:** Open Woodland of occasional *Eucalyptus marginata* over a Low Open Woodland of *Banksia attenuata* and *Banksia menziesii* over an Open-heath of *Allocasuarina humilis*, *Conostephium minus* and *Eremaea pauciflora* over an open grassland/sedgeland of *Amphipogon turbinatus* and *Mesomelaena pseudostygia* on grey sand;
- **CcEmAf:** Low Woodland of *Corymbia calophylla* and *Eucalyptus marginata* with occasional *Allocasuarina fraseriana*, *Banksia attenuata* and *Banksia menziesii* with occasional #*Melaleuca nesophila* and *Calothamnus quadrifidus* over introduced grasses in brown sand;
- **EmBaS:** Open Woodland of *Eucalyptus marginata* over a Low Open Woodland of *Banksia attenuata* and *Banksia menziesii* over a Low Open Heath of *Allocasuarina humilis*, *Xanthorrhoea preissii* and *Hibbertia hypericoides* over an open sedgeland of *Mesomelaena pseudostygia* in grey-yellow sand; and
- **Rehabilitated:** Rehabilitated area fringed by *Corymbia calophylla*, *Eucalyptus marginata* and *Kunzea ericifolia* subsp. *ericifolia*.

  Where # denotes a non-endemic species.

Vegetation Condition: Excellent: vegetation structure intact; disturbance affecting individual species and weeds are non-aggressive species (Keighery, 1994).

To

Completely Degraded: the structure of the vegetation is no longer intact and the area is completely or almost completely without native species (Keighery, 1994).

Soil and Landform Type: The application area is mapped within the EnvGeol S8 Phase subsystem, which is described as 'sand, very light grey at the surface, yellow at depth, fine to medium grained, sub rounded quartz, moderately well sorted of eolian origin' (Schoknecht et al., 2004).

Comment: The local area considered in the assessment of this application is defined as a 10 kilometre radius around the perimeter of the application area.

According to available aerial imagery, approximately 12 per cent native vegetation cover is remaining in the local area. The following surveys have been conducted within the vicinity of the application area:

- The application area was initially surveyed during 12 September, 10 November 2009, and 19 April 2010. This involved a Level 2 flora and vegetation survey and a Level 1 Fauna survey for the Kwinana Third Lane Project which extends from Roe Highway to Leach Highway. The entire application area was covered by this survey (AECOM, 2010).
- A detailed flora and vegetation survey was conducted in June 2017 between Russell Road and Roe Highway (MRIA, 2017). The application area is located outside of this survey area. However as part of this survey, permanent quadrats were established in areas of close proximity to Banksia Woodlands of the Swan Coastal Plain TEC. Two permanent quadrats were established in vegetation adjacent to the application area. The quadrats were scored in June 2017 and re-scored in September 2017 (MRIA, 2017).
- On 6 March 2018, following a change in project scope, a preliminary impact assessment was conducted over the majority of the application area (AECOM, 2018). This survey involved traversing the application area by foot to verify vegetation mapping from the 2010 AECOM report, record additional observations including disturbance and extent of native

vegetation, and determine the occurrence and extent of the Banksia Woodlands of the Swan Coastal Plain TEC and black cockatoo habitat within the application area (AECOM, 2018).

In 2019, the Metropolitan Road Improvement Alliance (MRIA) reviewed the results of these previous surveys and assessed the flora, vegetation and fauna values as applicable to the application area (MRIA, 2019). The vegetation condition of the application area was determined from the MRIA (2019) assessment.

Figure 1: Map of application area (cross-hatched blue)

3. Minimisation and mitigation measures

The applicant provided the following minimisation and mitigation measures on the clearing permit application form:

- Modifications to the drainage basin design has resulted in a smaller basin size to minimise the amount of native vegetation clearing required (MRWA, 2018).

On 18 March 2019, the Department of Water and Environmental Regulation (DWER) wrote to the applicant advising that the proposed clearing had the potential to result in the loss of 0.58 hectares of the Banksia Woodlands of the Swan Coastal Plain TEC (hereinafter referred to as the Banksia Woodlands TEC), loss of black cockatoo foraging habitat and the loss of suitable habitat for threatened flora. The applicant subsequently amended the application by minimising the amount of clearing applied for within the application area from 0.78 hectares to 0.72 hectares.

On 16 May 2019, DWER wrote to the applicant requesting further information on minimisation and mitigation measures considered by MRWA during the development of this proposal. MRWA clarified that the current drainage basin has insufficient capacity to capture road runoff in accordance with road drainage design standards. The upgrades to the drainage system along the freeway is to capture all road runoff and to prevent flooding down gradient at South Street (MRWA, 2019). It is noted that alternatives to avoid and minimise the clearing required for the basin have been considered by MRWA, including:

- Reducing drainage standards and increasing the risk if overtopping;
- Investigating updated modelling and PC Sump software which may have changed the infiltration rate and potentially reduced the basin size;
- Changing the basin capacity by using retaining walls to steepen batters; and
- Investigating whether there was capacity downstream to allow for the overflow to the South Street interchange, which already has drainage overtopping issues.

It is noted that the alternatives above were problematic and the only recourse was to expand the basin as per the current application area (MRWA, 2019).

4. Assessment of application against clearing principles

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

Proposed clearing is at variance to this Principle

The application is to clear up to 0.72 hectares of native vegetation for the purposes of road construction and upgrades as indicated within Figure 1.

According to available databases, ten threatened flora and 44 priority flora species have been previously recorded from the local area (Western Australian Herbarium, 1998–). The closest record is of *Styphelia filifolia* (Priority 3 under the *Biodiversity Conservation Act 2016*), which has been recorded approximately 150 metres from the application area. *Styphelia filifolia* occurs sporadically from Eneabba to the Harvey area, generally in sandy soils of the coastal plain and usually in *Banksia* or Jarrah woodland in low-lying situations (Hislop and Puente-Lelievre, 2017). The centre of its distribution is within the Perth metropolitan area, however despite having a known distribution, this species appears to be nowhere common, which makes its conservation status problematic (DBCA, 2019b). *Caladenia huegelii* (Critically Endangered under the *Biodiversity Conservation Act 2016*) is the closest threatened flora species, located approximately 600 metres from the application area. It is known from 41 records from Wanneroo to Busselton and is found in grey or brown sand, clay loam (Western Australian Herbarium, 1998–). Given this close proximity to the application area, these conservation significant flora species may potentially occur within the application area (DBCA, 2019b; MRIA, 2017).

One field survey which covered an area between Leach Highway and Roe Highway recorded a total of 328 flora species from 182 genera and 63 families (AECOM, 2010). This survey also involved a targeted survey for *Caladenia huegelii* (AECOM, 2010). In June 2017, two permanent quadrats were established immediately adjacent (within 10 metres) to the application area, and a total of 59 native flora species from 46 genera and 25 families were recorded (MRIA, 2017). The surveys did not record any priority or threatened flora species from within the application area or in the immediate vicinity (AECOM, 2010; MRIA, 2017). However, confirmed that the application area may provide suitable habitat for *Caladenia huegelii* and does contain suitable habitat for *Styphelia filifolia*.

In 2018, the application area was revisited to review the vegetation type and condition mapping of previous surveys (AECOM, 2018). The field survey determined that the vegetation types previously published by AECOM (2010) were an accurate representation of on-ground conditions. No threatened or priority flora species were observed during this site assessment (AECOM, 2018).
The application area occurs within the mapped Banksia Woodlands TEC, which is based on the Commonwealth's 'likely to occur' areas and incorporates broad-scale mapping of areas most likely to contain the TEC. The Banksia Woodlands TEC is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Banksia Woodlands TEC is restricted to areas in and immediately adjacent to the Swan Coastal Plain IBRA bioregion, including the Dandaragan plateau. This coastal plain stretches from around Jurien Bay in the north, to Dunsborough in the south (DotEE, 2016). This TEC has undergone a decline of approximately 60 per cent in its original extent, and almost all that remains occurs as highly fragmented patches less than 10 hectares in size (DotEE, 2016).

This TEC has a dominant *Banksia* component, which includes at least one of four key species - *Banksia attenuata* (candlestick banksia), *Banksia menziesii* (firewood banksia), *Banksia prionotes* (acorn banksia) and/or *Banksia ilicifolia* (holly-leaved banksia) (DotEE, 2016). It provides habitat for many native plants and animals that rely on *Banksia* woodlands for refuge and foraging opportunities. Remaining patches of the ecological community provide important wildlife corridors and refuges in a mostly fragmented landscape (DotEE, 2016).

Three vegetation types were recorded within the survey area, BAtS, EmBaS, CcEmAf, of which all were representative of the Banksia Woodlands TEC (AECOM, 2010; AECOM, 2018; MRIA, 2019). The survey identified approximately 6.4 hectares of the Banksia Woodlands TEC in a good to excellent (Keighery, 1997) condition (AECOM, 2018).

The applicant has advised that 0.7 hectares of the surveyed Banksia Woodlands TEC is located within the application area and is proposed to be cleared (MRWA, 2019). A review of condition mapping indicates that the area of Banksia Woodlands TEC within the application area ranges from a good to excellent (Keighery, 1994) condition, with the majority being in good to very good (Keighery, 1994) condition (AECOM, 2018; MRIA, 2019).

A total of five weed species were recorded during the 2017 survey (MRIA, 2017). The proposed clearing may increase the risk of introduction or spread of weeds and dieback into nearby remnant vegetation. The implementation of weed and dieback management will assist in managing this risk.

According to available databases, 359 terrestrial fauna species have been recorded in the local area (Department of Biodiversity, Conservation and Attractions, 2007-). Of these, 43 are of conservation significance, comprising one Priority 1 fauna species, three Priority 3 fauna species, seven Priority 4 fauna species, one fauna species classified as specially protected, 21 fauna species protected under international agreement, and nine threatened fauna species (Department of Biodiversity, Conservation and Attractions, 2007-). Five species of conservation significance were determined to likely occur within the application area, based on the vegetation types present, BAtS, EmBaS and CcEmAf, which contain suitable fauna habitat features (AECOM, 2010):

- Carnaby's Cockatoo (*Calyptorhyncus latirostris*) – Endangered;
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable;
- Black-striped Snake (*Neelaps calonotos*) – Priority 3;
- Lined Skink (*Lerista lineata*) – Priority 3; and
- Quenda (*Isoodon obesulus fusciventer*) – Priority 4.

One of the above fauna species, Carnaby's cockatoo, was observed during the 2010 field survey (AECOM, 2010). A black cockatoo habitat assessment conducted over the application area did not locate any breeding trees (>500 millimetres diameter at breast height) for black cockatoos. However, the entire application area (0.72 hectares) contains suitable black cockatoo foraging habitat (MRWA, 2019).

The application area contains vegetation in a good to excellent (Keighery, 1994) condition, a TEC and significant habitat for black cockatoos. Therefore, the application area contains a high level of biodiversity and is at variance to this Principle.

Taking into account the applicant's avoidance and minimisation measures (outlined in Section 3 of this assessment), it is considered that a suitable offset (outlined in Section 5 of this assessment) will counterbalance impacts to biodiversity. The applicant has advised that the proposed offset will consist of land acquisition.

(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.

Proposed clearing is at variance to this Principle

As discussed in Principle (a), 359 terrestrial fauna species including 43 conservation significant fauna species have been recorded within the local area. The three vegetation types, BAtS, EmBaS and CcEmAf that occurs within the application area provide fauna habitat values that support conservation significant fauna species including the Carnaby's cockatoo, Forest Red-tailed black cockatoo, Black-striped Snake, Lined Skink and Quenda (AECOM, 2010).

The Lined Skink is found in the southern areas of the Swan Coastal Plain, and it is noted that this species has been recorded from the nearby Fiona Stanley Hospital Site (AECOM, 2010). The Black-striped Snake inhabits dunal areas, supporting heathlands and *Banksia/*Eucalypt woodlands. The Black-striped Snake is restricted and only found on the Swan Coastal Plain between Mandurah and Lancelin (AECOM, 2010). These species were not recorded during the fauna survey, however the application area is likely to provide suitable habitat for these species.

The Quenda are widely distributed near the south coast from Guilderton north of Perth to east of Esperance. On the Swan Coastal Plain, Quenda are often associated with wetlands (DEC, 2012). The application area does not contain any wetlands or vegetation growing in association with a wetland. However, the Quenda Wetland Reserve occurs approximately 810 metres northwest of the application area. This reserve provides an important fauna habitat within the City of Melville, and is part of the regional ecological linkage throughout the Swan Coastal Plain, linking adjacent wetlands such as the Piney Lakes Reserve to the north, and North Lake and Bibra Lake to the south (City of Melville, 2016). The application area is not mapped as part of this ecological linkage surrounding the Quenda Wetland Reserve. However, given the close proximity and the occurrence of remnant vegetation in mostly good to very good (Keighery, 1994) condition within a highly cleared landscape, it may provide opportunities for dispersal.

The vegetation within the application area supports marri trees suitable for black cockatoo foraging (AECOM, 2010; AECOM, 2018). The Carnaby's cockatoo is listed as Endangered and Forest Red-tailed black cockatoo is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Black cockatoo's breed in large hollow-bearing trees, within woodlands or forests or in isolated trees (Commonwealth of Australia, 2012). These species nest in hollows in live or dead trees of karri, marri, wandoo, tuart, salmon gum, jarrah, flooded gum, York gum, powder bark, bullich and blackbutt (Commonwealth of Australia, 2012). Black cockatoos have a preference for foraging habitat that includes jarrah and marri woodlands and forest heathland, and woodland dominated by proteaceous plant species such as *Banksia* sp., *Hakea* sp. and *Grevillea* sp. (Commonwealth of Australia, 2012).

A black cockatoo assessment was conducted over a portion of the application area, and did not identify any potential breeding trees. A total of 0.83 hectares of suitable foraging habitat for Carnaby's Cockatoo and 0.54 hectares of suitable habitat for Forest Red-tailed Black Cockatoo occurs within the surveyed area. It is noted that in total, the application area contains 0.72 hectares of black cockatoo foraging habitat (MRWA, 2019).

The application area forms part of a narrow corridor of remnant vegetation in an extensively cleared landscape. Approximately 0.7 hectares of the 0.72 hectares applied to be cleared is representative of the Banksia Woodlands TEC (MRIA, 2019). The Approved Conservation Advice for the Banksia Woodlands TEC (2016) states "*patches that provide corridors or linkages within a largely modified landscape are particularly important as wildlife habitat and to the viability of biota within those patches of the ecological community into the future, provided that threats are adequately managed*" (DoTEE, 2016). Therefore, the proposed clearing may be significant, as it involves further clearing of already narrow remnants that may provide an ecological linkage in a highly cleared landscape.

Given the above and noting that the application area provides significant foraging habitat for black cockatoos and may provide an ecological linkage between patches of remnant vegetation within a highly cleared landscape, the proposed clearing is at variance to this Principle.

Taking into account the applicant's avoidance and minimisation measures (outlined in Section 3 of this assessment), it is considered that a suitable offset (outlined in Section 5 of this assessment) will counterbalance impacts to black cockatoos. The applicant has advised that the proposed offset will consist of land acquisition.

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

Proposed clearing is not likely to be at variance to this Principle

According to available databases, ten threatened flora species have been recorded in the local area (Western Australian Herbarium, 1998–). The closest record is of *Caladenia huegelii*, located approximately 600 metres of the application area (Western Australian Herbarium, 1998–).

As discussed in Principle (a) the application area was surveyed in 2009 which included a targeted survey for *Caladenia huegelii* (AECOM, 2010), and again in 2018 to review the vegetation type and condition mapping of previous surveys (AECOM, 2018). The area immediately adjacent to the application area was also surveyed in June and September 2017 (MRIA, 2017). The 2018 survey determined that the vegetation types previously published by AECOM (2010) were an accurate representation of on-ground conditions. No threatened flora species were observed during the 2009, 2017 and 2018 surveys (AECOM, 2010; AECOM, 2018; MRIA, 2017). The proposed clearing is not likely to significantly impact upon habitat required for the continued existence of threatened flora species.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

(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.

Proposed clearing is not likely to be at variance to this Principle

The 'Herb rich shrublands in clay pans' TEC is the nearest State listed TEC to the application area, located approximately 8.2 kilometres northeast. This ecological community is listed as Vulnerable under the *Biodiversity Conservation Act 2016*.

This TEC occurs on clay pans and represented by floristic community type 8 (Department of Parks and Wildlife, 2015), of which both characteristics are not present within the application area (AECOM, 2010; AECOM, 2018; MRIA, 2017; MRIA, 2019).

Given the above, the proposed clearing is not likely to be at variance to this 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.

Proposed clearing is not likely to be at variance to this Principle

The application area is located within the Swan Coastal Plain IBRA bioregion. This bioregion has approximately 38.62 per cent of its pre-European vegetation extent remaining (Government of Western Australia, 2019a). The application area is also mapped as Bassendean Complex-Central and South, which retains approximately 26.9 per cent pre-European extent (Government of Western Australia, 2019b). The local area retains approximately 12 per cent native vegetation.

The National Objectives and Targets for Biodiversity Conservation 2001-2005 include a target to have clearing controls in place that prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750 (Commonwealth of Australia 2001). The mapped vegetation complex and the local area fall below the threshold level of 30 per cent and therefore the application area is located within an area that has been extensively cleared. In the Perth Metropolitan and Bunbury regions, the Environmental Protection Authority (EPA) has a modified objective to retain at least 10 per cent of the pre-clearing extent of vegetation complexes for defined constrained areas (intensely developed) (EPA, 2015; EPA, 2003; Government of Western Australia, 2000).

The application area contains vegetation in completely degraded to excellent (Keighery, 1994) condition, a TEC and significant habitat for black cockatoos. Therefore the application area is a significant remnant, however as the application is located within a constrained area it is not considered to be a significant remnant in an area that has been extensively cleared.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

Table 1: Vegetation extents

	Pre-European extent (ha)	Current extent (ha)	% remaining*	Current extent in all DBCA managed land (ha)	% Current Extent in all DBCA managed land (proportion of Pre-European extent)
IBRA Bioregion:*					
Swan Coastal Plain	1,501,221	579,813	38.62	222,916	14.85
Beard vegetation association in Bioregion:*					
1001	57,410	12,660	22.05	1,796	3.13
South Coastal Plain vegetation complex:**					
Bassendean Complex-Central and South (44)	87,476	23,508***	26.87***	4,377	5

*Government of Western Australia. (2019a)

**Government of Western Australia. (2019b)
***Current extent and % remaining statistics are provisional until remnat vegetation at Keralup is field validated (Government of Western Australia, 2018).

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

Proposed clearing is not likely to be at variance to this Principle

According to available databases, there are no watercourses or wetlands within the area proposed to clear. The vegetation associations recorded within the application area were not determined to be growing in, or in association with, an environment associated with a watercourse or wetland.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle

The majority of the application area has been mapped within the following soil type (Schoknecht et al., 2004):

Land Degradation Risk Category	EnvGeol S8 Phase: Sand - very light grey at surface, yellow at depth, fine to medium-grained, sub-rounded quartz, moderately well sorted of eolian origin
Water Erosion	<3% of map unit has a high to extreme water erosion risk
Wind Erosion	>70% of map unit has a high to extreme wind erosion risk
Waterlogging	3-10% of map unit has a moderate to very high waterlogging risk
Flooding	<3% of the map unit has a moderate to high flood risk
Salinity risk	30-50% of map unit has a moderate to high salinity risk or is presently saline

The application area has a high to extreme wind erosion risk and moderate to high risk of salinity. Given the proposed clearing is along an existing major road, it is not likely that the proposed clearing will significantly increase salinity and cause appreciable land degradation. The application area may potentially be impacted by wind erosion if clearing is not managed appropriately. The potential impacts of wind erosion may be mitigated by the implementation of a staged clearing condition.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

(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.

Proposed clearing is not likely to be at variance to this Principle

The application area does not occur within or adjacent to any conservation areas. The closest conservation area is a freehold parcel of land located approximately 40 metres south of the application area. A Bush Forever Site (244) is also located approximately 1,222 metres from the application area. The application area may provide an ecological linkage between conservation areas within the local area.

As the application area is separate from any conservation areas due to the presence of existing main roads, the proposed clearing is not likely to have a direct significant impact on any conservation areas.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

(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.

Proposed clearing is not likely to be at variance to this Principle

Groundwater salinity within the application area is mapped <500 total dissolved solids, milligrams per litre. This level of groundwater salinity is classified as 'fresh'. Given the clearing proposed is alongside an existing major road, the proposed clearing is not likely to increase groundwater salinity.

As discussed in Principle (f), there are no wetlands or watercourses intersected by the application area. Given that the application area does not contain any areas of surface water, the proposed clearing is not likely to degrade the quality of surface water.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle

Less than three per cent of the mapped soil unit has a moderate to high flood risk, and 3 to 10 per cent of the mapped soil unit has moderate to very high waterlogging risk (Schoknecht et al., 2004). Based on this relatively low risk of flooding and waterlogging, the proposed clearing is not likely to cause or exacerbate, the incidence or intensity of flooding.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

Planning instruments and other relevant matters.

The applicant has not referred this road widening project to the Commonwealth Department of the Environment and Energy (DotEE) (MRWA, 2018).

No Aboriginal Sites of Significance have been mapped within the application area.

On 15 March 2019, DWER wrote to the applicant advising the significant residual impact of the proposed clearing within the Banksia Woodlands TEC, and the requirement for an offset. In response to DWER's letter, the applicant provided an offset proposal following the *WA Environmental Offsets Guidelines*.

The clearing permit application was advertised on the DWER website on 22 January 2019 with a 21 day submission period. Two public submissions have been received in relation to this application. In summary, the submission raised the following matters:

- The proposed clearing is inconsistent with the end land-use as consulted with the public during the time of construction of Fiona Stanley Hospital;
- The clearing of the endangered Banksia Woodlands TEC is against accepted published conservation advice and will have an adverse impact on the survival of this TEC;
- The proposed clearing may impact on the habitat of threatened flora and fauna species, and involve the loss of native vegetation that is significant as a remnant within an extensively cleared landscape; and
- The loss of vegetation will detract from the landscape and aesthetic value of the Principal Shared Use Path (Submission, 2019).

Concerns relating to the Banksia Woodlands TEC and conservation significant flora and fauna species have been addressed under Principles (a), (b), (c) and (d) above and under section 5 below.

In regard to the first dot point, MRWA has advised that they were not aware of any restriction on road construction around the Fiona Stanley Hospital. The application area is within the Primary Region Road reserve and MRWA was not party to any commitments made during the public consultation process undertaken for the Fiona Stanley Hospital project (MRWA, 2019).

The City of Melville indicated that no planning approvals would be required. In regard to the environmental impacts, the City of Melville noted the importance of retaining the Banksia Woodlands TEC within the application area, as it provides ideal foraging places for both Carnaby's Cockatoo and Forest Red-Tailed Cockatoo. The City of Melville requests the opportunity to translocate and collect specimens/seeds from the site prior to the commencement of clearing (City of Melville 2019).

5. Suitability of Proposed Offset

After avoidance, minimisation and mitigation (outlined in Section 3 of this report), it is considered that the proposed clearing will result in the following significant residual impacts:

- 0.72 hectares of foraging habitat for black cockatoos; and
- 0.7 hectares of Banksia Woodlands TEC.

The applicant had proposed an offset, to counterbalance the significant residual impacts listed above, consisting of:

- Montery contribution for the land acquisition of 4 hectares to counterbalance impacts to Banksia Woodlands TEC.

In assessing whether the proposed offset is adequately proportionate to the significant environmental values listed above, DWER undertook a calculation using the Commonwealth Offsets Assessment Guide. DWER's calculations determined that 3.81 hectares was required to offset the signficant residual impacts associated with black cockatoo habitat and the Banksia Woodlands TEC. These areas were calculated using values agreed upon between DWER and Main Roads. A quality score of 6 was used to reflect the good to very good (Keighery, 1994) condition of the vegetation within the application area.

In an email of 26 June 2019, Main Roads formally accepted DWER offset calculations.

6. References

AECOM Australia Pty Ltd (AECOM) (2010). Kwinana Freeway Third Lane - Flora and Fauna Survey. Unpublished report for Main Roads Western Australia prepared by AECOM Australia Pty Ltd, Western Australia, September 2010 (DWER Ref: A1753054).

AECOM Australia Pty Ltd (2018). Kwinana Freeway Northbound Widening – Farrington Road to Fiona Stanley Hospital, Letter from AECOM to Main Roads Western Australia Western Australia, March 2018. (DWER Ref: A1753060).

City of Melville (2016). Quenda Wetland Reserve Strategic Management Plan, published report prepared by the City of Melville, Western Australia, August 2016.

City of Melville (2019). Response to direct interest request received 6 February 2019. (DWER Ref: A1762877).

Commonwealth of Australia (2001). National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.

Commonwealth of Australia (2012). EPBC Act referral guidelines for three threatened Black Cockatoo species. Department of Sustainability, Environment, Water, Populations and Communities, Canberra.
Department of Biodiversity, Conservation and Attractions (DBCA) (2019a). Species and Communities response to advice request received 4 February 2019 (DWER Ref: A1763121).
Department of Biodiversity, Conservation and Attractions (DBCA) (2019b). Swan Coastal Region response to regional advice request received 13 March 2019 (DWER Ref: A1772002).
Department of the Environment and Energy (DotEE) (2016). Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (s 266B). Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community.
Department of Parks and Wildlife (2015). Interim Recovery Plan 2015-2020 for Clay pans of the Swan Coastal Plain (Swan Coastal Plain community types 7, 8, 9 and 10a) and Clay pans with mid dense shrublands of *Melaleuca lateritia* over herbs. Interim Recovery Plan No. 354, Department of Parks and Wildlife, Perth.
Environmental Protection Authority (EPA) (2003). Bulletin 1108 – Greater Bunbury Region Scheme, Report and recommendations of the Environmental Protection Authority, Environmental Protection Authority, Perth.
Environmental Protection Authority (EPA) (2008). Guidance Statement 33: Environmental Guidance for Planning and Development, Environmental Protection Authority, Perth.
Environmental Protection Authority (EPA) (2015). Perth and Peel @ 3.5 million - Environmental impacts, risks and remedies, Interim strategic advice of the Environmental Protection Authority to the Minister for Environment under section 16(e) of the Environmental Protection Act 1986. Environmental Protection Authority, Perth.
Government of Western Australia (2019a). 2018 South West Vegetation Complex Statistics. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth, https://catalogue.data.wa.gov.au/dataset/dbca.
Government of Western Australia (2019b). 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics.
Heddle, E. M., Loneragan, O. W., and Havel, J. J. (1980). Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
Hislop, M., and Puente-Lelievre, C. (2017). Five new species of *Styphelia* (Ericaceae: Epacridoideae: Styphelieae) from the Geraldton Sandplains, including notes on a new, expanded circumscription for the genus. Nuytsia, vol. 28, pp. 95-114.
Keighery, B.J. (1994). Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
Main Roads Western Australia (MRWA) (2018). Clearing permit application CPS 8315/1 and supporting information. (DWER Ref A1753062).
Main Roads Western Australia (MRWA) (2019). Additional information provided in relation to clearing permit application CPS 8315/1. (DWER Ref A1797918).
Metropolitan Road Improvement Alliance (MRIA) (2017). Detailed Flora and Vegetation Assessment - Kwinana Freeway Northbound Widening Project - Russell Road to Roe Highway. Unpublished report for Main Roads Western Australia prepared by Metropolitan Road Improvement Alliance, Western Australia, October 2017. (DWER Ref:
Metropolitan Road Improvement Alliance (MRIA) (2019). Flora, Vegetation and Fauna Assessment - Kwinana Freeway Widening - Farrington Road to Fiona Stanley Hospital. Report for Main Roads Western Australia, Unpublished report prepared by Metropolitan Road Improvement Alliance, Western Australia, April 2019. (DWER Ref:
Schoknecht, N., Tille, P. and Purdie, B. (2004). Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs' Resource Management Technical Report No. 280. Department of Agriculture.
Submission (2019). Submissions for Clearing Permit Application CPS 8315/1. Received on 11 February 2019 (DWER Ref: A1764081 and A1764077).
Western Australian Herbarium (1998–). FloraBase—the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. https://florabase.dpaw.wa.gov.au/. Accessed May 2019.

GIS Databases:

- Aboriginal Sites of Significance
- DBCA Managed Estate
- Directory of Important Wetlands
- Geomorphic Wetlands Swan Coastal Plain
- Groundwater salinity
- Hydrography, hierarchy
- Hydrography, linear
- Land Degradation datasets
- SAC Bio Datasets
- Soils, Statewide
- Topographic contours
- Vegetation Complexes Swan Coastal Plain