



## Clearing Permit Decision Report

### 1 Application details and outcome

#### 1.1. Permit application details

<b>Permit number:</b>	CPS 9906/1
<b>Permit type:</b>	Area permit
<b>Applicant name:</b>	Shire of Plantagenet
<b>Application received:</b>	4 October 2022
<b>Application area:</b>	0.69 hectares of native vegetation
<b>Purpose of clearing:</b>	Expansion of waste management facility
<b>Method of clearing:</b>	Mechanical
<b>Property:</b>	Lot 7546 on Deposited Plan 186612
<b>Location (LGA area/s):</b>	Shire of Plantagenet
<b>Localities (suburb/s):</b>	Mount Barker

#### 1.2. Description of clearing activities

The vegetation proposed to be cleared is 0.69 hectares of native vegetation distributed across six separate areas within Lot 7546 on Deposited Plan 186612, Mount Barker (see Figure 1, Section 1.5). The proposed clearing is to facilitate the expansion of a waste management facility.

#### 1.3. Decision on application

<b>Decision:</b>	Granted
<b>Decision date:</b>	7 April 2025
<b>Decision area:</b>	0.69 hectares of native vegetation, as depicted in Section 1.5, below.

#### 1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix F.1), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into account that the purpose of the clearing is for the expansion of a waste management facility and will provide public benefit. The proposed works will also upgrade current emissions management infrastructure and minimise the impact of future emissions and discharges to environmental receptors.

The assessment identified that the proposed clearing will result in:

- the loss of native vegetation that is suitable habitat for five (5) conservation significant fauna and is significant as a remnant of native vegetation in an area that has been extensively cleared (23.58% vegetation remaining)
  - Carnaby's cockatoo (*Zanda latirostris*),
  - Baudin's cockatoo (*Zanda calyptorhynchus*),

- forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*),
- South-western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) and
- western ringtail possum (*Pseudocheirus occidentalis*)
- the area contains suitable black cockatoo habitat trees containing hollows, one of which has old evidence of potential black cockatoo activity.
- the loss of vegetation growing in, or in association with a wetland or watercourse and
- potential land degradation in the form of waterlogging and subsurface acidification.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing may have long-term adverse impacts on environmental values, however the extent of native vegetation in the local area and riparian vegetation that can be minimised and managed to be unlikely lead to an unacceptable risk to environmental values. The applicant has suitably demonstrated avoidance and minimisation measures and has agreed to an offset to counterbalance the significant residual impacts of the clearing on black cockatoo breeding habitat and extensively cleared remnant vegetation (see Section 4).

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds,
- management conditions for western ringtail possums and South-western brush tailed phascogale,
- management of Black Cockatoo habitat,
- offsetting Black Cockatoo hollows through the installation of 5 artificial hollows, and
- biodiversity offsets

## 1.5. Site maps

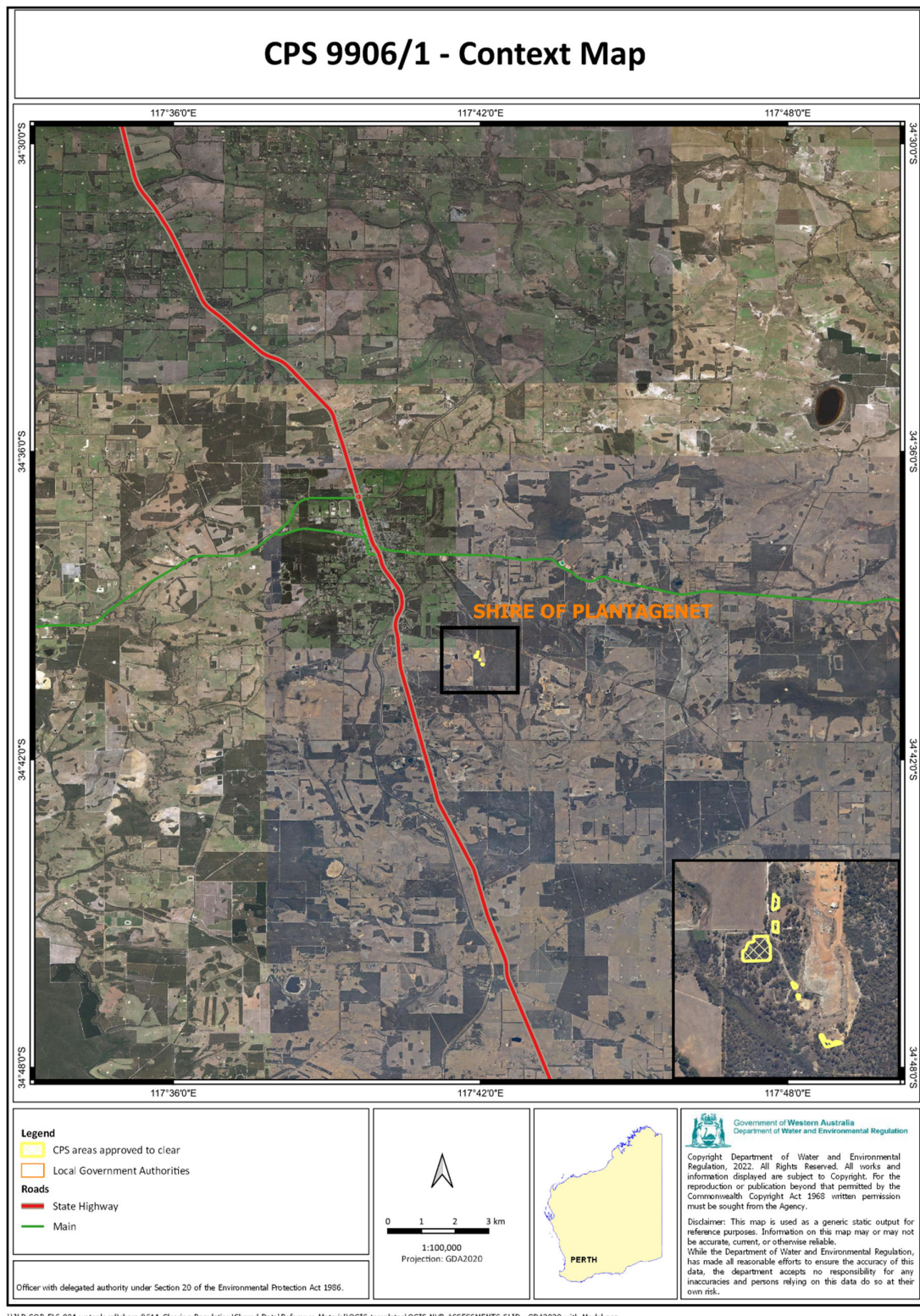


Figure 1. Context map of the application area. The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.



## CPS 9906/1 - Map



Figure 2. Map of the application area. The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.



## 2 Legislative context

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

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the polluter pays principle
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

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

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Environmental Offsets Guidelines* (August 2014)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

## 3 Detailed assessment of application

### 3.1. Avoidance and mitigation measures

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

The Shire has indicated that the proposed clearing cannot be avoided given the necessity of clearing for landfill capacity. The Shire have advised that:

*“Avoidance of native vegetation clearing was a key consideration in the preparation and planning of the Proposal. The 2.45 ha NVCP application area has been restricted to areas of the Development footprint which have been disturbed previously disturbed where practicable.*

*The NVCP application area has a disturbance area of approximately 2.45 ha including 0.69 ha of native vegetation and 1.76 ha of Cleared/ Disturbed (Figure 2, Attachment A). The native vegetation within the NVCP application area was mapped in a Degraded condition and Cleared/ Disturbed areas in Completely Degraded condition (Figure 3, Attachment A).*

*The remainder of the Development footprint is comprised of areas of the following:*

- 4.35 ha of previous landfill area
- 1.88 ha previously subject to DWER clearing permit 4256/1, approved 16/05/2011 and expired 16/05/2013 (Figure 4, Attachment A).” (Shire of Plantagenet 2022)

After consideration of avoidance and mitigation measures, it was determined that an offset is necessary to counterbalance the significant residual impacts to;

- The loss of 0.66 hectares of native vegetation that is considered to be low quality foraging and roosting habitat for all three black cockatoo species.
- The loss of 0.69 hectares of native vegetation that is significant as a remnant within an extensively cleared landscape (local area < 30%).
- The loss of two potential Black Cockatoo breeding trees.

In accordance with the Government of Western Australia's *Environmental Offsets Policy* and *Environmental Offsets Guidelines*, these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided are summarised in Section 4.

### 3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B) identified that the impacts of the proposed clearing present a risk to biological values (fauna), significant remnant vegetation, and impacts associated with clearing riparian vegetation. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

#### 3.2.1. Biological values (fauna) - Clearing Principles (a) & (b)

##### Assessment

Based on evidence provided by the applicant in the form of a fauna survey and black cockatoo habitat assessment (Bio Diverse Solutions 2021; Appendix E), the proposed clearing will result in the loss of 0.66 hectares of native vegetation that is considered to be low quality foraging and roosting habitat for all three black cockatoo species known from the local area (Appendix A).

There was no evidence of Black Cockatoo nesting activity within the survey area and no birds seen or heard during the field survey (Bio Diverse Solutions, 2021). However, two potential Black Cockatoo breeding trees (DBH greater than 500 mm) with hollows are located within the application area. Of these trees, one has a suitable hollow, however there was no recent evidence of nesting or hollow occupation observed during the field survey (Bio Diverse Solutions, 2021).

There was no evidence of Black Cockatoo foraging within the survey area during the field survey (Bio Diverse Solutions, 2021). The application area contains approximately 0.06 ha of potential preferred foraging habitat (*Corymbia calophylla* and *Eucalyptus marginata* woodland) which was in degraded condition (Shire of Plantagenet 2022).

Black cockatoo habitat can be considered in terms of breeding habitat, night roosting habitat, and foraging habitat. Black cockatoos will generally forage up to 12 kilometres from an active breeding site (DSEWPac 2012; DPaW = 2013). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPac 2012; DPaW 2013) but may range up to 20 kilometres (Commonwealth of Australia 2017). Black cockatoo night roosts are usually located in the tallest trees of an area, and near both a food supply and surface water (Commonwealth of Australia 2017). Flocks will use different night roosts, often for weeks, or until the local food supply is exhausted. Flocks show some fidelity to night roosts with sites used in most years to access high-quality feeding sites. However, not all-night roosts are used in every year (DPaW 2013). Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (Commonwealth of Australia 2017). Preferred habitats for three Black Cockatoo species are listed below:



Habitat	Baudin's	Carnaby's	Forest Red-tailed
<b>Breeding</b>	Generally, in woodland or forest, but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of karri <i>Eucalyptus diversicolor</i> , marri <i>Corymbia calophylla</i> , wandoo <i>E. wandoo</i> and tuart <i>E. gomphocephala</i> .	Generally, in woodland or forest, but also breeds in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of salmon gum <i>E. salmonophloia</i> , wandoo, tuart, jarrah <i>E. marginata</i> , flooded gum <i>E. rudis</i> , york gum <i>E. loxophleba</i> subsp. <i>loxophleba</i> , powder bark <i>E. accedens</i> , karri and marri.	Generally, in woodland or forest, but may also breed in former woodland or forest now present as isolated trees. Nest in hollows in live or dead trees of marri, karri, wandoo, bullich <i>E. megacarpa</i> , blackbutt <i>E. patens</i> , tuart and jarrah.
<b>Roosting</b>	Generally, in or near riparian environments or other permanent water sources. Jarrah, marri, flooded gum, blackbutt <i>E. patens</i> , tuart, and introduced eucalypts including blue gum <i>E. globulus</i> , and lemon scented gum <i>Corymbia citriodora</i> .	Generally, in or near riparian environments or natural and artificial permanent water sources. Flat-topped yate <i>E. occidentalis</i> , salmon gum, wandoo, marri, karri, blackbutt, tuart, introduced eucalypts (for example blue gum) and introduced pines.	Tall jarrah, marri, blackbutt, tuart and introduced eucalypt trees within or on the edges of forests.
<b>Foraging</b>	Eucalypt woodlands and forest, and Proteaceous woodland and heath. During the breeding season feed primarily on native vegetation, particularly marri. Outside the breeding season, may feed in fruit orchards (mostly apple and pear, but also persimmon) and tips of <i>Pinus</i> spp.	Native shrubland, Kwongkan heathland and woodland dominated by Proteaceous plant species such as <i>Banksia</i> spp. (including <i>Dryandra</i> spp.), <i>Hakea</i> spp. and <i>Grevillea</i> spp. Forages in pine plantations ( <i>Pinus</i> spp.), eucalypt woodland and forest that contains foraging species. Also, individual trees and small stands of these species.	Jarrah and marri woodlands and forest, and edges of karri forests including wandoo and blackbutt, within the range of the subspecies.
<b>Foraging: common food items</b>	Mostly marri (seeds, flowers, nectar and grubs) and proteaceous trees and shrubs. Also, other native seeds and introduced fruits; insects and insect larvae; pith of kangaroo paw <i>Anigozanthos flavidus</i> ; juice of ripe persimmons; tips of <i>Pinus</i> spp. and seeds of apples and pears.	Seeds, flowers and nectar of native Proteaceous plant species (for example, <i>Banksia</i> spp., <i>Hakea</i> spp., <i>Dryandra</i> spp., and <i>Grevillea</i> spp.), eucalypts and Callistemon. Also seeds of introduced species including <i>Pinus</i> spp., <i>Erodium</i> spp., wild radish, canola, almonds and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons.	Mostly seeds of marri and jarrah, also <i>Eucalyptus caesia</i> , illyarrie, <i>E. erythrocorys</i> and some introduced eucalypts such as river red gum <i>E. camaldulensis</i> and flooded gum <i>E. grandis</i> , <i>Allocasuarina</i> cones, fruits of Snottygobble <i>Persoonia longifolia</i> and mountain marri <i>Corymbia haematoxylon</i> . On the Swan Coastal Plain, often feed on introduced cape lilac <i>Melia azedarach</i> .

(DSEWPac 2012)

The *Corymbia calophylla* (marri) and *Eucalyptus marginata* (jarrah) trees present provide suitable foraging habitat for Black cockatoos. While a survey noted no activity of Black cockatoos within the application area, black cockatoos are known to inhabit vegetation in and around the application area. There are no confirmed or unconfirmed roosting areas within the 10km study or survey area. However, data from the Great Cocky Count (DBCA, 2019) indicate that there is a roosting site approximately 4.5km to the northwest of the survey area.

Consequently, clearing of the marri and jarrah trees from the application area would remove approximately 0.001% of foraging habitat (within 40-kilometre radius) (Shire of Plantagenet 2022). The *EPBC Act 1999* referral guidelines for the three threatened black cockatoo species stipulates that a proposal should be referred for assessment if more

than 1ha of high-quality habitat is to be removed. Given the habitat present is less than 1 ha and is not of high-quality it is unlikely this proposal will need to be referred under the *EPBC Act 1999*.

The vegetation to be cleared includes suitable habitat for *Pseudocheirus occidentalis* (western ringtail possum(s)) and *Phascogale tapoatafa* (southwestern brush-tailed phascogales) (Bio Diverse Solutions 2021; Appendix A & F).

Southwestern brush-tailed phascogales are known to inhabit sclerophyll forests and open woodlands that contain hollow-bearing trees, preferring habitats that are connected patches with good over and understorey coverage. Western ringtail possum prefer habitats in the southern forests includes Jarrah, Marri or Karri dominated forests with connected canopies. The vegetation within the application area, while including suitable vegetation types, lacks the connectedness of vegetation preferred by these species, therefore is unlikely to provide significant habitat for the continuance of these species. No evidence of either species was recorded during a fauna survey of the application area (Bio Diverse Solutions 2021)

#### Conclusion

Based on the above assessment, the proposed clearing will result in a reduction of available habitat for conservation significant species. The proposed clearing cannot be avoided and given the extent of clearing in the local area (Appendix A) the loss of suitable habitat is likely to have a significant residual impact on Black Cockatoo species.

For the reasons set out above, it is considered that the impacts of the proposed clearing on fauna can, in part, be managed by fauna management conditions on the clearing permit. Significant residual impacts to Black Cockatoo species must be offset for an environmentally acceptable outcome.

#### Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Fauna management – western ringtail possums and South-western brush-tailed phascogale
- Fauna management (black cockatoo habitat)
- Installation of artificial hollows
- Offset -conservation of high quality black cockatoo habitat in perpetuity

### **3.2.2. Significant remnant vegetation - Clearing Principles (e)**

#### Assessment

Bio Diverse Solution (2021) indicate the vegetation within the proposed clearing area consists of four different vegetation units (Appendix A), broadly consistent with vegetation mapping which identifies the application area as the Nirrikup (3) IBRA Bioregion (medium jarrah Forrest and mainly jarrah and marri *Eucalyptus marginata*, *Corymbia calophylla*.)

The mapped vegetation types retain approximately 67.10 per cent of the original extent (Government of Western Australia, 2019). Spatial data indicates the local area (20-kilometre radius from the centre of the area proposed to be cleared) retains approximately 23.58 per cent of the original native vegetation cover.

The extent of the mapped vegetation is inconsistent with the national objectives and targets for biodiversity conservation in Australia. Assessment of the vegetation as significant for fauna has been determined under section 3.2.1 above.

#### Conclusion

Based on the above assessment, the proposed clearing will result in the loss of 0.69 hectares of native vegetation that is significant as a remnant within an extensively cleared landscape (local area < 30%).

For the reasons set out above, it is considered that the impacts of the proposed clearing on the extent of vegetation in an extensively clearing area cannot be managed and will have a significant residual impact that requires offsetting.

#### Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Offset - conservation of significant remnant of vegetation in an extensively cleared landscape, in perpetuity



### 3.2.3. Land and water resources (riparian vegetation, land degradation & water quality) - Clearing Principles (f), (g) & (i)

#### Assessment

The vegetation to be cleared includes 0.028 hectares of *Melaleuca cuticularis* [Melcut] Wetland vegetation in completely degraded condition (Bio Diverse Solutions 2021; Appendix A) This vegetation is riparian and part of the hydrological network within the local area which also includes a small perennial waterbody west of the application area, connected at surface level by a non-perennial river line.

Land degradation risk factors are high for waterlogging and subsurface acidification and mapped salinity is moderately high (3000-7000 total dissolved solids milligrams per litre).

Surface water enters the site from the north-eastern corner via a seasonal creek. A large surface water diversion drain carries water from the northern boundary of the site to the west of the landfill, where it enters a small sediment pond. Surface water at the site then drains in a southerly direction to Sleeman Creek in the southern half of the site, and eventually discharging into Blue Gum Creek approximately 23 km south of the site.

Informal channels run north to south down the eastern and western sides of the site to divert surface water in a southerly direction. An on-site sediment pond is currently located in the southwestern corner of the landfill, which collects surface water runoff from the landfill. However, this pond does not function properly due to a lack of formal drains to direct runoff towards this pond. Surface water within this sediment pond is contained and does not appear to be impacting surface water downstream, as the elevated nutrient and metal concentrations are not reflected at this location. However, there is potential for the pond to overflow and result in downstream surface water contamination (Shire of Plantagenet 2022).

New stormwater drains will be constructed along the east and west of the landfill footprint, diverting clean water from the upstream catchment around the landfill and towards the creekline to the south. Water resource impacts are predominately associated with the end land use for clearing and are managed through the applicants Works Approval.

DWER groundwater salinity mapping (DWER-026) indicates that the application area is located in an area with a total dissolved solution concentration of 3000-7000 mg/L (GoWA, 2022) which indicates saline groundwater quality (DER, 2021). The DPIRD soil salinity risk mapping (DPIRD-009) indicates the soil salinity risk within the application area is *"30-50% of map unit has a moderate to high salinity risk or is presently saline"* (GoWA, 2022). DPIRD flood risk mapping (DPIRD-007) indicates that the majority of the application area is mapped as *"10-30% of the map unit has a moderate to high flood risk"* (GoWA, 2022). Site preparation activities, including clearing, have the potential to generate dust from various sources.

Land degradation management measures will be implemented by the applicant as part of their Works Approval, and the clearing of the small extent of native vegetation within the application area is unlikely to contribute to long term land degradation impacts through salinity, sedimentation or dust emissions.

#### Conclusion

Based on the above assessment, the proposed clearing will result in clearing of native vegetation that is riparian and on soils which pose a risk of land degradation if not appropriately managed.

Land degradation risks are often managed through staged clearing requirements however the clearing proposed is spread over 6 separate areas and therefore will naturally occur in stages and therefore management conditions on the permit are not required.

The applicant has committed to the following management and mitigation measures:

- Landfill operations will be undertaken in such a way that contaminated surface water is retained within the active landfill area and not allowed to flow into non-waste areas.
- Progressive construction of stormwater drains to divert un-contaminated surface water away from the active landfill area and directly off site, diverting it around the sediment pond, if possible.
- Progressive rehabilitation of the landfill with intermediate or final capping to reduce the active landfill area and hence the area of exposed waste to generate contaminated surface water.
- Inspections of the landfill cap and stormwater and leachate infrastructure will be completed on a regular basis so that failure of any control measures can be identified and rectified, with additional inspections undertaken immediately before the onset of winter rains and
- immediately after heavy rain events.
  - Maintain a freeboard of 300 mm at all times within the leachate evaporation pond and sediment pond.

- Monitor groundwater, surface water and leachate quality at the premise to detect the potential migration of leachate.
- Management measures are proposed be implemented during construction and operation to manage potential indirect impacts to water courses
- and wetlands downstream of the Proposal.

The Delegated Officer considers that the small extent, condition of vegetation and mitigation and management measures are sufficient to manage the minor environmental risks to riparian vegetation, water quality and land degradation matters associated with the clearing on native vegetation.

### Conditions

No management conditions required.

### 3.3. Relevant planning instruments and other matters

The Shire of Plantagenet is proposing to expand the Mount Barker Waste Management Facility to include additional landfill cells to the west of the current public transfer station and existing landfill footprint, and south of the current liquid waste facility. The primary intent of the landfill expansion is to maximise the operational life of the landfill at the for an additional 29 years. The proposed expansion works are being supported through the staged capping of the completed landfill areas and the construction of stormwater management infrastructure. Previous clearing for the Mount Barker Waste Management Facility were authorised under clearing permit CPS 4256/1.

The Contaminated Sites Branch of the Department advised that the area permitted to be cleared is in proximity to active and historical asbestos disposal areas. They recommended that an appropriate health and safety management plan is used should any asbestos be encountered during the clearing.

A Works Approval ([W6937/2024/1](#)) has been granted for this project by the Department on 30 January 2025 and is valid till 29 January 2030. As part of the Works Approval the applicant is required to develop and adhere to a Construction Environmental Management Plan to manage stormwater and other emissions. The applicant has applied to clear parts of the Premise boundary however the clearing permit application area and premises boundary are not consistent. The Works Approval does not authorise clearing of native vegetation in this instance. Should the Shire wish to clear native vegetation outside of the clearing permit boundary they will need to seek to amend this permit or apply for a separate clearing permit for this vegetation.

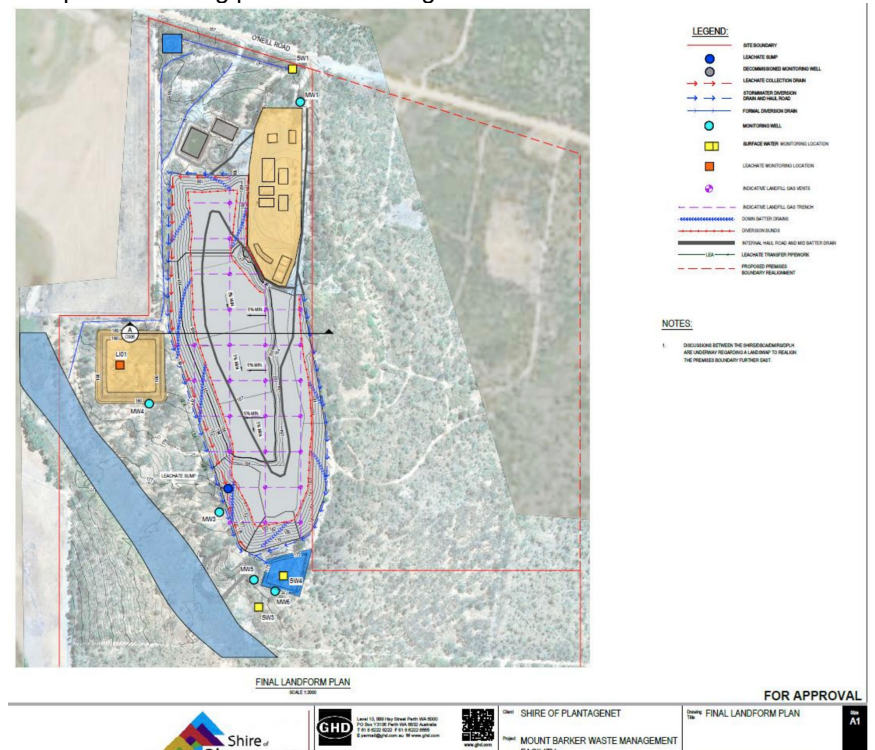


Figure 5: Final landform plan for Mount Barker Waste Management Facility



No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

#### 4 Suitability of offsets

##### Proposal

The Shire of Plantagenet is proposing to clear 0.69 hectares of native vegetation within Lot 7546 on Deposited Plan 186612 (Crown Reserve 23969), Mount Barker, for the purpose of expansion of a waste management facility.

The vegetation proposed to be cleared consists of *Corymbia calophylla* and *Eucalyptus marginata* Woodland, *Eucalyptus occidentalis* open forest, and *Melaleuca cuticularis* wetland in completely degraded to degraded (Keighery, 1994) condition.

##### Necessity of clearing

The purpose of the clearing is for the expansion of a waste management facility within the Shire of Plantagenet and will provide public benefit. The Shire has indicated that the current available airspace at the landfill is likely to reach the final design height in less than five years, requiring the landfill to be reprofiled, capped and closed and an additional landfill area (constructed as three new cells) adjoining the west of the current landfill. The proposed works will also upgrade current emissions management infrastructure and minimise the impact of future emissions and discharges to environmental receptors.

##### Residual impacts

The following significant residual impacts will persist once clearing is undertaken;

- The loss of 0.66 hectares of native vegetation that is low quality foraging and roosting habitat for all three black cockatoo species.
- The loss of 0.69 hectares of native vegetation that is significant as a remnant within an extensively cleared landscape (local area < 30%).

##### Mitigation and avoidance measures

The Shire have advised that the proposed clearing cannot be avoided given the necessity of clearing for landfill capacity. The proposed clearing locations have been selected in areas where previous disturbance has occurred, and native vegetation is in degraded to completely degraded (Keighery 1994) condition.

##### Proposed offset

The offset area is within Lot 350 on Deposited Plan 417644, Mount Barker, which occurs adjacent to the proposed clearing site within Lot 7546 on Deposited Plan 186612 and is part of the greater Crown Reserve 23969.

The offset area comprises 3.04 hectares of *Corymbia calophylla* and *Eucalyptus marginata* woodland, *Eucalyptus occidentalis* woodland, and *Eucalyptus occidentalis* open woodland, in a completely degraded to excellent (Keighery, 1994) condition, which will be designated for conservation under the control and management of the Shire of Plantagenet.

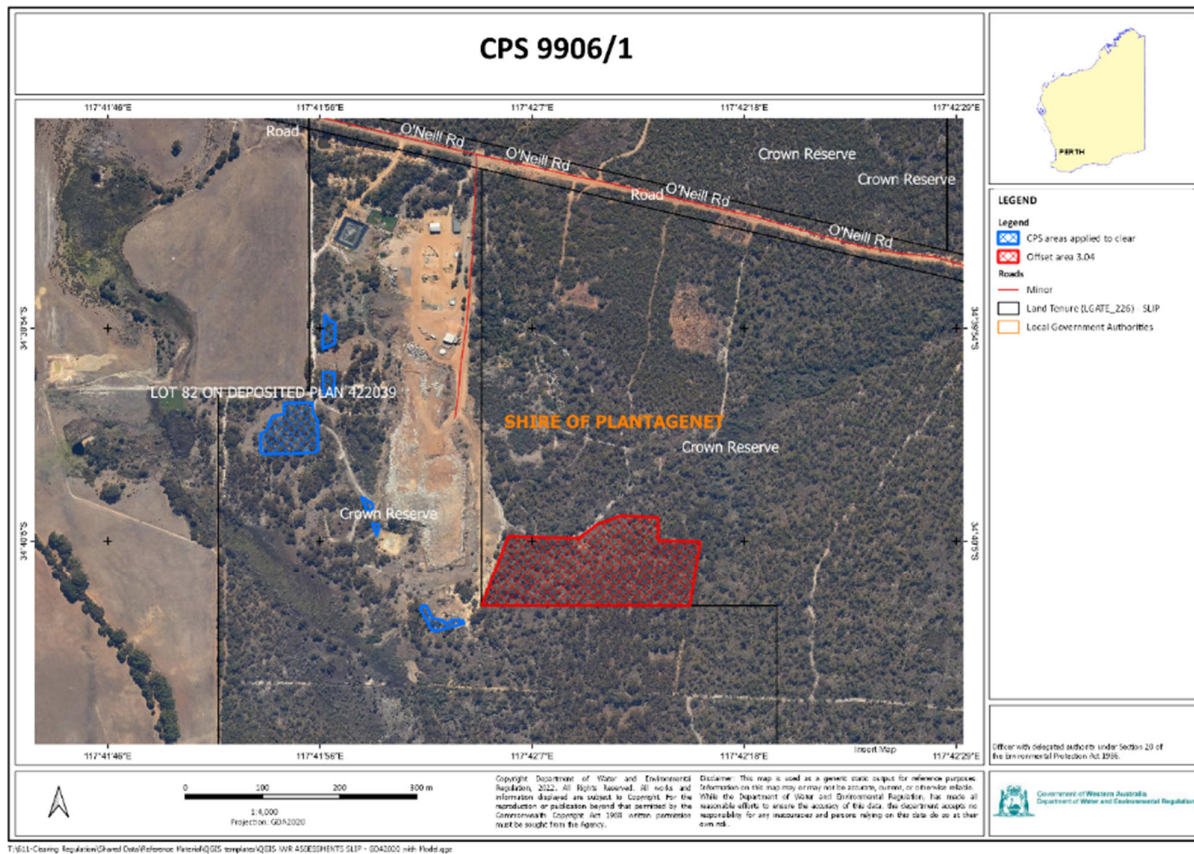


Figure 6: Area applied to be cleared under CPS 9906/1 in comparison to the proposed offset site (cross hatched red)

### Offset Adequacy

Based on the Department's offset calculations, the offset required to counterbalance the significant residual impacts (SRI) of the proposed clearing is:

- 2.82 hectares of native vegetation that provides significant black cockatoo habitat and,
- 1.73 hectares of native vegetation that is significant as a remnant within an extensively cleared landscape.

The Shire of Plantagenet proposed the change of vesting of 3.04 hectares as an offset to counterbalance the SRI of the proposed clearing; this area exceeds the offset requirements, with the Shire of Plantagenet have confirmed that they will bank the additional 0.22 hectares for future use. Surveys of the offset area confirm the presence of suitable environmental values to counterbalance the significant residual impacts of clearing (Bio Diverse Solutions, 2021).

Complementary conditions such as requiring a fauna specialist to inspect black cockatoo habitat trees prior to clearing and, installation of artificial nesting hollows within the offset area will also be used to manage risks associated with the clearing and the significant residual impacts. These factors have been taken into consideration when determining the quantum of the offset required.

### Summary

It is considered that the Shire's offset proposal is adequate to counterbalance the significant residual impacts listed above and is consistent with the WA Environmental Offsets Policy (2011) and the WA Environmental Offset Guidelines (2014).

The justification for the values used in the offset calculation is provided in Appendix D.

End



## Appendix A. Site characteristics

### A.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is 0.69 hectares of native vegetation within six separate area in the extensive land use zone of Western Australia. It is adjacent to the O'Neill Road waste management facility and cleared farmland areas.</p> <p>Spatial data indicates the local area (20-kilometre radius from the centre of the area proposed to be cleared) retains approximately 23.58 per cent of the original native vegetation cover.</p>
Ecological linkage	<p>The application area is not attached to any formal ecological linkages; the closest ecological linkage is the south coastal ecological linkage approximately 1 kilometre south of the application area.</p> <p>The proposed clearing is will not sever any ecological linkages.</p>
Conservation areas	<p>DBCA nature reserve (R10003) is approximately 330 meters from the application area. During the application process the reserve was altered. Pursuant to section 6 of the <i>Reserves Act 2023</i>, Lot 350 was excised from Crown Reserve 10003 and vested as a "Rubbish Disposal Site". Section 6 of the <i>Reserves Act 2023</i> was proclaimed and commenced on 27 March 2024.</p>
Vegetation description	<p>Bio Diverse Solution (2021) indicate the vegetation within the proposed clearing area consists of four different vegetation units including:</p> <ol style="list-style-type: none"> <li><b>Cleared/ disturbed: <i>Eucalyptus occidentalis</i> Open Woodland</b>, over <i>*Chamaecytisus palmensis</i> and <i>*Acacia pycnantha</i> thicket, over <i>*Phytolacca octandra</i> Dwarf Scrub C, over <i>*Ehrharta longiflora</i> and <i>*Bromus diandrus</i> Dense Tall Grass, over <i>*Lolium rigidum</i>, <i>*Cenchrus clandestinus</i> and <i>*Lolium arundinaceum</i> Dense Low Grass, over <i>*Raphanus raphanistrum</i>, <i>*Watsonia meriana</i> and <i>*Fumaria capreolata</i> Dense Herb.</li> <li><b><i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> [Corcal Eucmar] Woodland:</b> <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> Woodland, over <i>*Chamaecytisus palmensis</i> Dense Thicket, over <i>*Ehrharta longiflora</i> and <i>*Lolium arundinaceum</i> Open Grass, over <i>*Fumaria capreolata</i> and <i>*Watsonia meriana</i> Open Herb.</li> <li><b><i>Eucalyptus occidentalis</i> [Eucocc] Open Forest:</b> <i>Eucalyptus occidentalis</i> Dense Forest, over <i>Hakea prostrata</i>, <i>Agonis flexuosa</i>, <i>*Chamaecytisus palmensis</i> Scrub, over <i>Acacia extensa</i>, <i>*Paraserianthes lophantha</i> and <i>*Watsonia meriana</i> Low Scrub A and B, over <i>Xanthorrhoea gracilis</i> and <i>Pimelea ciliata</i> open Dwarf Scrub C and D, over <i>Machaerina juncea</i>, <i>Cyathochaeta avenacea</i> and <i>Desmocladius asper</i> Very Open Tall and Low Sedges, over <i>*Sonchus oleraceus</i>, <i>*Arctotheca calendula</i> and <i>*Hypochaeris radiata</i> Herbs, over <i>*Ehrharta longiflora</i> and <i>*Bromus diandrus</i> Tall Grass, over <i>*Lolium rigidum</i>, <i>*Briza maxima</i> and <i>*Briza minor</i> Low Gras.</li> <li><b><i>Melaleuca cuticularis</i> [Melcut] Wetland:</b> <i>Melaleuca cuticularis</i> Open Low Scrub A, over <i>Cyathochaeta avenacea</i> Very Open Tall Sedges, over <i>Isolepis marginata</i> and <i>*Cyperus tenellus</i> Very Open Low Sedges, over <i>*Watsonia meriana</i>, <i>*Raphanus raphanistrum</i> and <i>Stylidium spathulatum</i> Herbs, over <i>*Bromus diandrus</i> Very Open Tall Grass, over <i>*Briza minor</i> and <i>Neurachne alopecuroidea</i> Very Open Low Grass.</li> </ol> <p>Vegetation mapping identifies the application area as the Nirrikup (3) IBRA Bioregion described as a medium jarrah Forrest, pre-European vegetation stats stat that the vegetation is descried as Mainly jarrah and marri <i>Eucalyptus marginata</i>, <i>Corymbia calophylla</i>.</p> <p>The mapped vegetation types retain approximately 67.10 per cent of the original extent (Government of Western Australia, 2019).</p>

Characteristic	Details																		
Vegetation condition	<p>Bio Diverse Solution 2021 indicate the vegetation within the proposed clearing area is mostly ranges from degraded to completely degraded (Keighery, 1994) condition.</p> <table><tr><th>Vegetation type</th><th>Condition rating</th><th>Area (ha)</th></tr><tr><td>Cleared / Disturbed</td><td>Completely Degraded</td><td>1.00</td></tr><tr><td><i>Corymbia calophylla</i> and <i>Eucalyptus marginate</i> [Carcal Eucmar] Woodland</td><td>Degraded</td><td>0.046</td></tr><tr><td><i>Eucalyptus occidentalis</i> [Eucocc] Open Forest</td><td>Degraded</td><td>0.609</td></tr><tr><td><i>Melaleuca cuticularis</i> [Melcut] Wetland</td><td>Completely Degraded</td><td>0.028</td></tr><tr><td>Total</td><td></td><td>1.68</td></tr></table> <p>The full Keighery (1994) condition rating scale is provided in Appendix C. Representative photos are available in Appendix E.</p>	Vegetation type	Condition rating	Area (ha)	Cleared / Disturbed	Completely Degraded	1.00	<i>Corymbia calophylla</i> and <i>Eucalyptus marginate</i> [Carcal Eucmar] Woodland	Degraded	0.046	<i>Eucalyptus occidentalis</i> [Eucocc] Open Forest	Degraded	0.609	<i>Melaleuca cuticularis</i> [Melcut] Wetland	Completely Degraded	0.028	Total		1.68
Vegetation type	Condition rating	Area (ha)																	
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<i>Melaleuca cuticularis</i> [Melcut] Wetland	Completely Degraded	0.028																	
Total		1.68																	
Climate and landform	<p>The climate experienced in the application area is Mediterranean, characterized by hot and dry summers and cool and wet winters. According to the Bureau of Meteorology (2021), an average of 726 millimetres of rainfall is recorded annually from the Mount Barker – BOM rainfall station (no. 009581), which is the closest weather station in operation. The majority of this rainfall is received between the months of June to August (BoM 2022).</p>																		
Soil description	<p>The soil type across the application area is mapped as the Caldyanup Subsystem (254KeCA): Plains with drainage floors and low rises. Yellow solonetzic soils; Hakea scrub, Paperbark woodland. Humus podzols; Kangaroo Grass sedgeland. Reddish yellow earths; Hakea scrub</p>																		
Land degradation risk	<p>The degradation risk factors mapped over the application area are detailed below:</p> <table><tr><th colspan="2">Caldyanup Subsystem: 254KeCA</th></tr><tr><td>Wind erosion</td><td>M1: 10-30% of map unit has a high to extreme wind erosion risk</td></tr><tr><td>Water erosion</td><td>L2: 3-10% of map unit has a high to extreme water erosion risk</td></tr><tr><td>Salinity risk</td><td>M2: 30-50% of map unit has a moderate to high salinity risk or is presently saline</td></tr><tr><td>Phosphorous export</td><td>M1: 10-30% of map unit has a high to extreme phosphorus export risk</td></tr><tr><td>Waterlogging</td><td>H2: &gt;70% of map unit has a moderate to very high waterlogging risk</td></tr><tr><td>Subsurface acidification</td><td>H2: &gt;70% of map unit has a high subsurface acidification risk or is presently acid</td></tr><tr><td>Flooding</td><td>L2: 3-10% of the map unit has a moderate to high flood risk</td></tr></table>	Caldyanup Subsystem: 254KeCA		Wind erosion	M1: 10-30% of map unit has a high to extreme wind erosion risk	Water erosion	L2: 3-10% of map unit has a high to extreme water erosion risk	Salinity risk	M2: 30-50% of map unit has a moderate to high salinity risk or is presently saline	Phosphorous export	M1: 10-30% of map unit has a high to extreme phosphorus export risk	Waterlogging	H2: >70% of map unit has a moderate to very high waterlogging risk	Subsurface acidification	H2: >70% of map unit has a high subsurface acidification risk or is presently acid	Flooding	L2: 3-10% of the map unit has a moderate to high flood risk		
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Waterlogging	H2: >70% of map unit has a moderate to very high waterlogging risk																		
Subsurface acidification	H2: >70% of map unit has a high subsurface acidification risk or is presently acid																		
Flooding	L2: 3-10% of the map unit has a moderate to high flood risk																		
Waterbodies	<p>The desktop assessment and aerial imagery indicated a small perennial waterbody to the west of the application area. Furthermore, the application area overlaps with a small unnamed nonperennial river line (drain).</p>																		
Hydrogeography	<p>The application area is within the Warren-Denmark hydrological zone, Denmark Coast basin and Wilson Inlet Hay River hydrographic catchment.</p> <p>No water protection areas exist over the application area.</p> <p>The salinity of the application area is mapped at 3000-7000 total dissolved solids milligrams per litre.</p>																		
Flora	<p>According to available databases, 83 conservation significant flora species have been recorded within the local area (20-kilometre buffer). Comprising four Priority 1, 18 Priority 2, 23 Priority 3, 21 Priority 4, and 17 threatened flora taxa.</p>																		

Characteristic	Details
	Based on the flora and vegetation assessment (Bio Diverse Solutions, 2021), there are no known threatened or priority flora within the application area. The timing of the surveys coincided with the main flowering period of the majority of the conservation significant flora identified in the desktop assessment and therefore the survey effort is considered to be appropriate.
Ecological communities	<p>One threatened (TEC) and priority (PEC) ecological community was identified in the 10km desktop analysis, 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)'. None of the vegetation units present within the survey area are consistent with this ecological community, with only two Proteaceous species were identified within the survey area (Bio Diverse Solutions 2021).</p> <p>Of the TEC/PEC's listed but not occurring within the local area, one was identified with similarities to the vegetation types identified within the survey area; 'Swamp Yate, Eucalyptus occidentalis, woodlands in seasonally inundated clay basins (South Coast)'.  Given the, the condition of the vegetation and the &lt;70% perennial weed coverage over the area, it is unlikely that the vegetation within the application area currently meets the diagnostic criteria for this priority ecological community.</p>
Fauna	<p>According to available databases, 33 conservation significant fauna species have been recorded within the local area comprising of two Priority 2, one Priority 3, six Priority 4, seven endangered, seven vulnerable, two critically endangered, five migratory, and two conservations dependent. fauna taxa. Based on the distance from the application area, the habitat requirements and vegetation type, the following species may have transient habitat within the application area:</p> <ul style="list-style-type: none"> <li>• Baudin's cockatoo</li> <li>• Carnaby's cockatoo</li> <li>• Forest red tailed black cockatoo</li> <li>• Muir's cockatoo</li> <li>• South-western Brush tailed phascogale</li> <li>• Western ringtail possum</li> </ul>

## A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Jarrah Forest	4,506,660.25	2,399,838.15	53.25	1,673,614.25	69.74
Vegetation complex					
Narrikup (3)	2,390,591.54	1,604,101.56	67.10	1,299,263.74	81.00
Local area					
10km radius	127,897.82	30,158.54	23.58	-	-

\*Government of Western Australia (2019a)

\*\*Government of Western Australia (2019b)



**A.3. Fauna analysis table**

Species name	Conservation status	Suitable habitat features?	Suitable vegetation type?	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify?
Baudin's cockatoo ( <i>Zanda baudinii</i> )	EN	Y	Y	2.75	57	Y
Carnaby's cockatoo ( <i>Zanda latirostris</i> )	En	Y	Y	2.24	71	Y
Forest red-tailed black cockatoo ( <i>Calyptorhynchus banksii naso</i> )	Vu	Y	Y	4.58	159	Y
Muir's corella ( <i>Cacatua pastinator pastinator</i> )	CD	Y	Y	4.58	1	Y
South-western brush-tailed phascogale, wambenger ( <i>Phascogale tapoatafa wambenger</i> )	CD	Y	Y	6.33	7	Y
Western ringtail possum, ngwayir ( <i>Pseudocheirus occidentalis</i> )	CR	Y	Y	2.88	26	Y

T: threatened, CR: critically endangered, EN: endangered, Vu: vulnerable, P: priority

**A.4. Ecological community analysis table**

Community name	Conservation status	Suitable habitat features?	Suitable vegetation type?	Suitable soil type?	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify?
Eucalypt woodlands of the Western Australian Wheatbelt	P3	Y	Y	Y	12.04	93	N
Proteaceae dominated kwongan shrublands of the southeast coastal floristic province of Western Australia	P3	Y	Y	Y	12.99	24	N
South Coast Porongurup Range Karri Forest	P1	N	N	N	12.02	1	N
Wet ironstone heath community (Albany District) (all/or portion in EPBC listed Kwongan community)	P1	N	N	Unknown	18.13	1	N

T: threatened, CR: critically endangered, EN: endangered, Vu: vulnerable, P: priority

## Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> “Native vegetation should not be cleared if it comprises a high level of biodiversity.”</p> <p><u>Assessment:</u> The area proposed to be cleared does contain regionally significant fauna habitats. The Application area does not contain habitat that is likely to represent any priority ecological communities.</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> “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.”</p> <p><u>Assessment:</u> The area proposed to be cleared does contain foraging habitat for Carnaby's cockatoo, Baudin's cockatoo, and Forest red-tailed black cockatoo, in addition to critical habitat for the Western ringtail possum.</p>	At variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u> The area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> “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.”</p> <p><u>Assessment:</u> The area proposed to be cleared does not contain species that can indicate a threatened ecological community. A threatened ecological community as defined in the Biodiversity Conservation Act 2016 section 5(1); or (b) any other ecological community listed, designated or declared as threatened, endangered or vulnerable under or for the purposes of a written law; or (c) a listed threatened ecological community as defined in the Commonwealth Environment Act section 528; This community is listed as ‘Endangered’ (etc) under the BC Act;</p>	Not likely to be at variance	No
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><u>Principle (e):</u> “Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</p> <p><u>Assessment:</u> The extent of the mapped vegetation is inconsistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (h):</u> “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.”</p> <p><u>Assessment:</u> Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of the nearby conservation area.</p>	Not likely to be at variance	No
<b>Environmental value: land and water resources</b>		
<p><u>Principle (f):</u> “Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</p> <p><u>Assessment:</u> One minor drainage system bisects the application area from with a small portion of the application area being mapped as <i>Melaleuca cuticularis</i></p>	At variance	Yes <i>Refer to Section 3.2.3, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
[Melcut] Wetland. The proposed clearing may impact on- or off-site hydrology and water quality. Management measures are proposed by the applicant.		
<p><u>Principle (g):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."</p> <p><u>Assessment:</u> The mapped soils are moderately susceptible to wind erosion and salinity risk and are highly susceptible to waterlogging, subsurface acidification. Noting the small extent of the application area, the condition of the vegetation, the proposed clearing may have an appreciable impact on land degradation. Management measures are proposed by the applicant.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<p><u>Principle (i):</u> "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."</p> <p><u>Assessment:</u> Given the application area intersects one small drainage river and the soils are susceptible to salinity, waterlogging and subsurface acidification, the proposed clearing may impact surface or ground water quality however the impacts are likely to be short term. Management measures are proposed by the applicant.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."</p> <p><u>Assessment:</u> The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.</p>	Not at variance	No

### Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

#### Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.



Condition	Description
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

#### Appendix D. Offset calculator value justification

##### Black Cockatoo habitat

Calculation	Score (Area)	Rationale
<b>Conservation significance</b>		
Description	0.68 ha of foraging and roosting habitat for Carnaby's, Baudin's and Forest red-tailed black cockatoo	The application area is located within the known distribution of Carnaby's, Baudin's and forest Red-tailed cockatoo habitat with suitable foraging and future breeding habitat identified within the application area.
Type of environmental value	Species (flora/fauna)	Carnaby's, Baudin's and Forest red-tailed black cockatoo
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's black cockatoo is listed as endangered under the BC Act (state) and EPBC Act (federal).
Landscape-level value impacted	yes/no	No - low quality foraging habitat smaller than 1 ha and fragmented with large areas of surrounding habitat in better quality.
<b>Significant impact</b>		
Description	Application to clear 0.68 hectares of native vegetation which is 'low quality' foraging and roosting habitat for black cockatoo	Application to clear 0.68 hectares of native vegetation which is 'low quality' foraging and roosting habitat for black cockatoo as described in reconnaissance flora and vegetation and basic fauna survey report by BioDiverseSolutions (2021) and GHD (2022) extrapolated areas.
Significant impact (hectares) / Type of feature	0.66	Black Cockatoo roosting and foraging habitat within the application area. – Corral Eucmar – potential Black Cockatoo foraging and roosting habitat (approximately 0.06 ha) – Eucocc – potential Black Cockatoo roosting habitat (approximately 0.62 ha).
Quality (scale) / Number	5.00	Considered Low quality - less than 1ha vegetation in Degraded to Completely Degraded condition. - Known roost sites 5 km away- Known breeding sites 28 km away.
<b>Offset</b>		
Description	Land swap with DBCA managed reserve with High quality foraging habitat	Land is located to the east of the O'Neill Road Waste Management Facility, within 19 ha of land currently in the process of being acquired from the DBCA managed reserve (Reserve 10003) during a land swap with the Shire.
Proposed offset (area in hectares)	2.82	The total area of rehabilitation required to counterbalance the significant residual impacts of the proposed clearing on BC foraging habitat by 100%.

Current quality of offset site / Start number (of type of feature)	8.00	The fauna habitat types are: – <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> woodland – <i>Eucalyptus occidentalis</i> woodland – <i>Eucalyptus occidentalis</i> open woodland. – Drainage line – drainage line on eastern boundary of the survey area – Cleared – previously cleared areas which may include some scattered native vegetation. Areas of native vegetation within the survey area ranged in condition from Completely Degraded (1.1%), Good (18.6%), Very Good (65.2%) to Excellent (15.1%)
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00	Quality will remain the same as the area is already conservation managed DBCA reserve
Future quality WITH offset (scale) / Future number WITH offset	8.00	Very Good maintain as per DBCA reserve and improved by – Regular removal of windblown waste from the adjacent landfill site – Revegetation of the “Cleared” area with <i>Corymbia calophylla</i> (Marri) and <i>Eucalyptus marginata</i> (Jarrah) – Installation and regular maintenance of artificial Black Cockatoo breeding hollows.
Time until ecological benefit (years)	2.00	2 year - expected length of time to secure offset site
Confidence in offset result (%)	0.95	High confidence expected as area will be retained by the Shire and ultimately form part of a strategic offset area for the Shire.
Duration of offset implementation (maximum 20 years)	20.00	The maximum duration of 20 years is applied as the area will ultimately form part of a strategic offset area for the Shire.
Time until offset site secured (years)	2.00	It is expected that the transfer of the land will occur within 2 year.
Risk of future loss WITHOUT offset (%)	20.0%	The land is currently joined with the rubbish tip
Risk of future loss WITH offset (%)	5.0%	The land will be conserved in perpetuity
Offset ratio (Conservation area only)	N/A	
Landscape level values of offset?	N/A	

#### Remnant vegetation

Calculation	Score (Area)	Rationale
<b>Conservation significance</b>		
Description	Significant remnant vegetation within an area that has been extensively cleared	The proposed clearing will impact on significant remnant native vegetation within an area that has been extensively cleared.
Type of environmental value	Vegetation/habitat	Significant remnant vegetation within an area that has been extensively cleared.
Conservation significance of environmental value	Terrestrial native vegetation complex - <30% extent remaining in the bioregion	The local area (10-kilometre radius from the application area) retains approximately 23.58 percent of its original vegetation extent.

Landscape-level value impacted	yes/no	The impact is to an area of the mapped vegetation complex in hectares.
<b>Significant impact</b>		
Description	Application to clear 0.69 hectares of native vegetation which is significant as a remnant of native vegetation in an extensively cleared local area	0.69 hectares of native vegetation that is significant as a remnant within an area that has been extensively cleared is proposed to be cleared for expansion of the Mount Barker Waste Management facility.
Significant impact (hectares) / Type of feature	0.69	Based on the available information from the reconnaissance flora survey report (Bio Diverse Solutions, 2021) and supporting information (GHD, 2022), the proposed clearing area includes approximately 0.06 hectares of marri and jarrah (Corcal Eucmar) woodland, approximately 0.62 hectares of swamp yate (Eucocc) woodland, and approximately 0.03 hectares of <i>Melaleuca cuticularis</i> (Melcut) wetland. Given the local area falls below the national targets for biodiversity conservation and the application area provides significant foraging and roosting habitat for black cockatoo species, the entire application area (0.69 hectares) is considered to be significant as a remnant within an extensively cleared local area.
Quality (scale) / Number	3.00	Based on the available information from the reconnaissance flora survey report (Bio Diverse Solutions, 2021) and supporting information (GHD, 2022), the application area is in Degraded (95%) to Completely Degraded (5%) (Keighery, 1994) condition. However, the vegetation within the proposed clearing area also contains habitat for black cockatoo species and wetland vegetation.
<b>Offset</b>		
Description	Change in vesting and conservation in perpetuity of native vegetation that is significant as a remnant within an extensively cleared landscape	The Shire has proposed to alter the vesting of an offset area within Lot 350 on Deposited Plan 417644 (Crown Reserve 23969) to Conservation in perpetuity, which contains significant remnant vegetation in the extensively cleared local area.
Proposed offset (area in hectares)	1.73	The area required to be conserved in perpetuity to counterbalance the significant residual impacts to native vegetation that is significant as a remnant within an extensively cleared landscape by 100%.
Current quality of offset site / Start number (of type of feature)	8.00	Based on the black cockatoo habitat assessment of the offset site (GHD, 2023), the fauna habitat types present are: <ul style="list-style-type: none"> <li>– <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> woodland (1.57 hectares),</li> <li>– <i>Eucalyptus occidentalis</i> woodland (0.88 hectares),</li> <li>– <i>Eucalyptus occidentalis</i> open woodland (0.53 hectares),</li> <li>- Drainage line with some native canopy (0.03 hectares), and</li> <li>- Previously cleared area (0.03 hectares).</li> </ul> Areas of native vegetation within the offset area are in Completely Degraded (1.1%), Good (18.6%), Very Good (65.2%), and Excellent (15.1%) (Keighery, 1994) condition.



		The offset area is adjacent to the application area within the local area and also contains suitable foraging, breeding and roosting habitat for black cockatoo species.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	8.00	Given the offset area within Lot 350 on Deposited Plan 417644 (Crown Reserve 23969) contains native vegetation in Completely Degraded to Excellent (Keighery, 1994) condition and is not currently subject to any ongoing management measures or significant threatening processes, it is reasonable to assume no change in quality in the absence of the offset.
Future quality WITH offset (scale) / Future number WITH offset	8.00	Given the offset area within Lot 350 on Deposited Plan 417644 (Crown Reserve 23969) is currently in Completely Degraded to Excellent (Keighery, 1994) condition and the proposed offset consists of conservation of the existing native vegetation in perpetuity with no ongoing land management proposed to improve vegetation quality, it is likely that the quality of significant remnant vegetation will be maintained.
Time until ecological benefit (years)	1.00	As the proposed offset relates to conserving an existing area of native vegetation in perpetuity, the minimum of one year for this field is applied.
Confidence in offset result (%)	0.95	There is a high level of confidence that the offset will be achieved, and that conservation of the offset site (in perpetuity) would successfully mitigate the future risk of loss of the site and maintain its current quality.
Duration of offset implementation (maximum 20 years)	20.00	The offset area within Lot 350 on Deposited Plan 417644 (Crown Reserve 23969) will be vested in Conservation in perpetuity. Therefore, the maximum duration of 20 years is applied.
Time until offset site secured (years)	2.00	It is assumed that the change in vesting to Conservation of the offset area within Lot 350 on Deposited Plan 417644 (Crown Reserve 23969) will occur within two years, noting the excision of this area from Reserve 10003 is being finalised.
Risk of future loss WITHOUT offset (%)	20.0%	The offset area within Lot 350 on Deposited Plan 417644 (Crown Reserve 23969) is currently vested as a Rubbish Disposal Site and adjacent to the existing Mount Barker Waste Facility. The offset area was previously part of Crown Reserve 10003 which was vested in Conservation, but has been excised pursuant to section 6 of the Reserves Act 2023. Therefore, there is currently a moderate risk of loss.
Risk of future loss WITH offset (%)	5.0%	The Shire intend to change the vesting of the offset area within Lot 350 on Deposited Plan 417644 (Crown Reserve 23969) to Conservation and manage the area for conservation long-term, which will reduce the risk of loss.
Offset ratio (Conservation area only)	N/A	
Landscape level values of offset?	N/A	

## Appendix E. Biological survey information excerpts / photographs of the vegetation

Extracts from Bio Diverse Solutions 2021



Reconnaissance flora and vegetation and basic fauna survey – Part Lot 7546, O'Neill Road Waste Receiving Site

### 5. Field Survey Results – Flora and Vegetation

#### 5.1. Flora Diversity

During the survey 62 flora species, consisting of 23 families and 50 genera were found. The most commonly occurring families were Poaceae, Asteraceae and Fabaceae. The list includes 21 native species (refer to Table A10 Appendix D), and 41 introduced / alien species. The vegetation units identified across the survey area are described in Section 5.2. Refer to Figure 7 for vegetation mapping, and Appendix D for full species list.

#### 5.2. Vegetation Units

Four vegetation types were identified during the survey period, vegetation descriptions can be found in the following sections, with relevé data presented in Appendix D. Refer to Figures 3 – 6 for photographs of vegetation units and Figure 7 or extent.

##### 1. Vegetation type: Cleared / Disturbed

Vegetation Description (NVIS): U +/- *Eucalyptus occidentalis* tree\7\bi; M^^ *Chamaecytisus palmensis*, *Phytolacca octandra*, +/- *Acacia pycnantha* shrub\^4,3\; G^^ *Raphanus raphanistrum*, *Fumaria capreolata*, *Ehrharta longiflora*, *Watsonia meriana* forb, grass\^2,1\.

Vegetation Description (Muir): *Eucalyptus occidentalis* Open Woodland, over *Chamaecytisus palmensis* and *Acacia pycnantha* thicket, over *Phytolacca octandra* Dwarf Scrub C, over *Ehrharta longiflora* and *Bromus diandrus* Dense Tall Grass, over *Lolium rigidum*, *Cenchrus clandestinus* and *Lolium arundinaceum* Dense Low Grass, over *Raphanus raphanistrum*, *Watsonia meriana* and *Fumaria capreolata* Dense Herbs.

Area: 1.00 ha

Site description: Flat sites with dark brown sandy soils, with poor drainage. Located in drainage depressions and flat ground / plains.

Condition: Completely Degraded.

Represented in R1, R2, R5 and R7 (refer to Appendix D).



Figure 3: Cleared / Disturbed vegetation unit present within the survey area.





Figure 3 continued.

## 2. Vegetation type: *Corymbia calophylla* and *Eucalyptus marginata* [Corcal Eucmar] Woodland

Vegetation Description (NVIS): U<sup>AA</sup> *Corymbia calophylla*, *Eucalyptus marginata* \tree\7i; M<sup>AA</sup> *Chamaecytisus palmensis* \shrub\4\; G<sup>AA</sup> *Fumaria capreolata*, *Watsonia meriana*, *Ehrharta longiflora*, *Lolium arundinaceum* \herb, grass\2,1\.

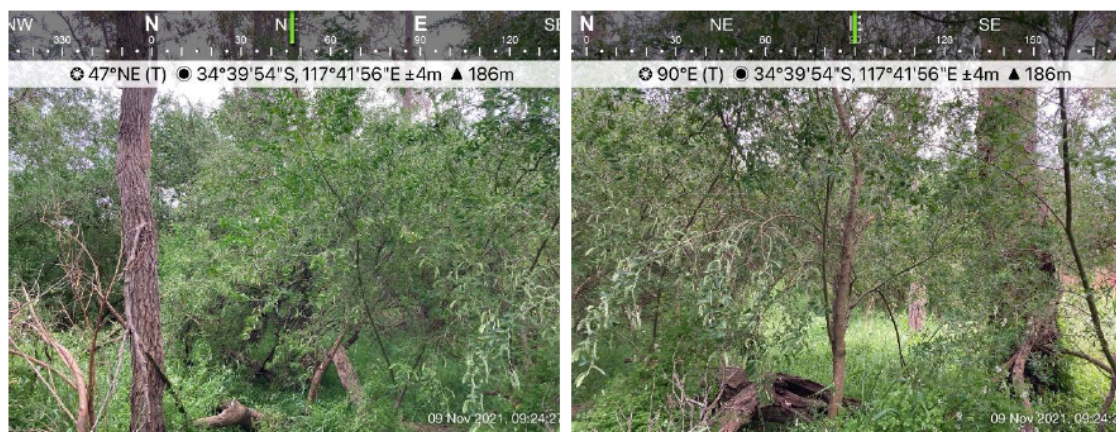
Vegetation Description (Muirs): *Corymbia calophylla* and *Eucalyptus marginata* Woodland, over *Chamaecytisus palmensis* Dense Thicket, over *Ehrharta longiflora* and *Lolium arundinaceum* Open Grass, over *Fumaria capreolata* and *Watsonia meriana* Open Herbs

Area: 0.046 ha.

Site description: Flat site in located adjacent to existing landfill area, with dark brown sandy soils that have poor drainage.

Condition: Degraded.

Represented in R3 (refer to Appendix D).

Figure 4: *Corymbia calophylla* and *Eucalyptus marginata* [Corcal Eucmar] Woodland vegetation unit present within the survey area.

## 3. Vegetation type: *Eucalyptus occidentalis* [Eucocc] Open Forest

Vegetation Description (NVIS): U<sup>AA</sup> *Eucalyptus occidentalis*, +/- *Corymbia calophylla* \tree\7\; M<sup>AA</sup> *Xanthorrhoea gracilis*, *Chamaecytisus palmensis*, *Paraserianthes lophantha* \shrub\3\; G<sup>AA</sup> *Watsonia meriana*, *Ehrharta longiflora*, *Briza maxima* \forb, grass\1\.

Vegetation Description (Muirs): *Eucalyptus occidentalis* Dense Forest, over *Hakea prostrata*, *Agonis flexuosa*, *Chamaecytisus palmensis* Scrub, over *Acacia extensa*, *Paraserianthes lophantha* and *Watsonia meriana* Low Scrub A and B, over *Xanthorrhoea gracilis* and *Pimelea ciliata* open Dwarf Scrub C and D, over *Machaerina juncea*, *Cyathochaeta avenacea* and





*Desmodium asper* Very Open Tall and Low Sedges, over *\*Sonchus oleraceus*, *\*Arctotheca calendula* and *\*Hypochaeris radiata* Herbs, over *\*Ehrharta longiflora* and *\*Bromus diandrus* Tall Grass, over *\*Lolium rigidum*, *\*Briza maxima* and *\*Briza minor* Low Grass.

Area: 0.609 ha.

Site description: Flat plains, with dark brown sandy soils and poor drainage.

Condition: Completely Degraded.

Represented in R4, R8 and R9 (refer to Appendix D).

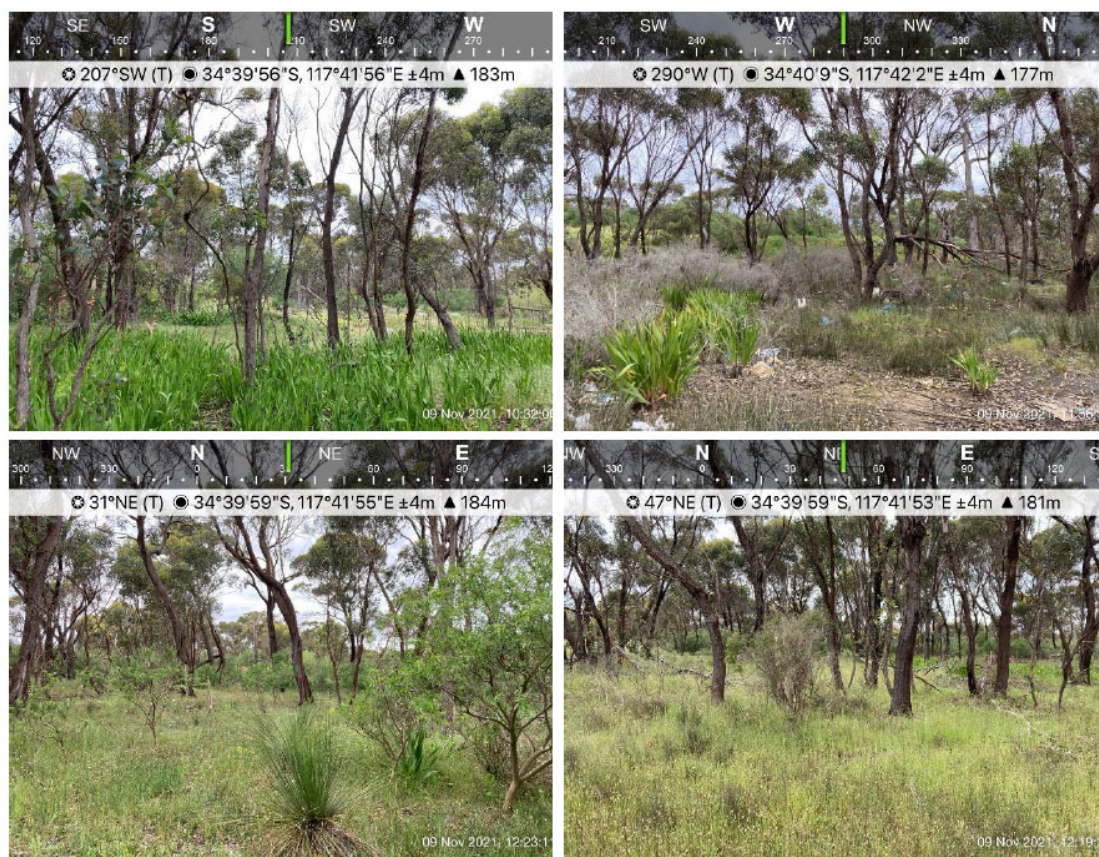


Figure 5: *Eucalyptus occidentalis* [Eucooc] Open Forest vegetation unit present within the survey area.

#### 4. Vegetation type: *Melaleuca cuticularis* [Melcut] Wetland

Vegetation Description (NVIS): U *Melaleuca cuticularis* shrub\4\; G^ ^*Watsonia meriana*, +/-*Bromus diandrus*, *Cyathochaeta avenacea* herb, grass, sedge\1\c

Vegetation Description (Muir): *Melaleuca cuticularis* Open Low Scrub A, over *Cyathochaeta avenacea* Very Open Tall Sedges, over *Isolepis marginata* and *\*Cyperus tenellus* Very Open Low Sedges, over *\*Watsonia meriana*, *\*Raphanus raphanistrum* and *Stylidium spathulatum* Herbs, over *\*Bromus diandrus* Very Open Tall Grass, over *\*Briza minor* and *Neurachne alopecuroides* Very Open Low Grass.

Area: 0.028 ha.

Site description: Flat drainage depression with dark brown sandy soils with poor drainage.

Condition: Degraded.

Represented in R6 (refer to Appendix D).





Figure 6: *Melaleuca cuticularis* [Melcut] vegetation unit present within the survey area.

### 5.3. Vegetation Condition

The vegetation condition for the survey area (Table 6) has been mapped using the condition rating scale (adapted from Keighery 1994) outlined in *EPA Flora and Vegetation Survey Technical Guidance* (2016).

The vegetation ranged from Degraded to Completely Degraded condition throughout the survey area. These classification levels are related to degradation of structure and vegetation integrity by processes such as clearing, fire, weeds, *Phytophthora* Dieback and vehicle tracks. The 'Cleared / Disturbed' and 'Melcut Wetland' units are classified as being in Completely Degraded condition, the 'Corcal Eucmar Woodland' and 'Eucocc Open Forest' are classified as being in Degraded condition. See Table 6 below for condition rating and size of each vegetation unit.

Table 6: Vegetation condition rating.

Vegetation type	Condition rating	Area (ha)
Cleared / Disturbed	Completely Degraded	1.00
<i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> [Corcal Eucmar] Woodland	Degraded	0.046
<i>Eucalyptus occidentalis</i> [Eucocc] Open Forest	Degraded	0.609
<i>Melaleuca cuticularis</i> [Melcut] Wetland	Completely Degraded	0.028
Total		1.68 ha

## 6.2. Targeted Black Cockatoo Assessment

### 6.2.1. Breeding habitat

A total of six significant trees were identified within and directly adjacent to the survey area, three of these were *Corymbia calophylla*, two were *Eucalyptus marginata* and one was *Eucalyptus occidentalis*. Of these six trees, Tree 1 and 4 were the only two trees recorded inside the survey area. Tree 1 had brushtail possum activity up the trunk, and showed some evidence of historical cockatoo or corella activity, consisting of old chew marks around the entrance of the main hollow. This may have been investigatory chewing. No recent evidence of cockatoo nesting or hollow occupation was observed. Tree 4 also had brushtail possum activity up the trunk, and contained a smaller sized hollow (6 x 8 cm) which is not currently considered suitable for black cockatoos. This tree is considered to have future suitable hollow forming potential for black cockatoos. Of the other remaining four trees, Tree 5 contained a potentially suitable black cockatoo hollow, and the remaining trees contained hollows that are too small and unlikely to develop into suitable hollows due to their location in small branches which limits their internal dimensions. None of the hollows that were considered suitable for cockatoos were occupied by cockatoos at the time of this survey. Please refer to Figure 9 for black cockatoo habitat identified, Table 8, for hollow assessment details and Figure 10 in for images of corresponding trees with hollows.

The vegetation in the 'Corcal and Eucmar Woodland' vegetation unit is considered Degraded, as it almost exclusively consists of an overstorey of Marri and Jarrah with no native mid or understorey present. All three species of black cockatoos are known to breed in hollows in both Marri and Jarrah within dense woodland and forest as well as isolated trees (DEC, 2008; DSEWPaC, 2012; DPaW, 2013). This vegetation unit contains a small number of suitable breeding hollows for all three black cockatoo species. However, for breeding habitat to be suitable, it needs to be proximate to high quality feeding resources and permanent water.

Of the trees surveyed, four (Tree 1, 2, 4, 6) were assessed as being occupied by brushtail possum or a small arboreal mammal (mardo) due to the presence of chew marks, rubbing and general activity around and up to the hollow entrance or visual observation of scats on or nearby to trees containing hollows.

### 6.2.2. Foraging and roosting habitat

During this survey, no evidence of feeding events (chewed nuts) was observed within the survey area. The mature Marri and Jarrah trees within the 'Corcal Eucmar Woodland' vegetation unit provide a potential food source for the three species of black cockatoo, but this is considered low quality due to the degraded nature of the vegetation. No other vegetation within the survey area contains suitable foraging habitat for black cockatoos. The foraging habitat available for black cockatoos equates to approximately 0.049 ha which is 7.53% of the black cockatoo habitat identified within the survey area (see Table 8).

There was no evidence of black cockatoos roosting within the survey area, as assessed through the presence of accumulated feathers and faecal material. However, there is potential roosting habitat present within the 'Corcal Eucmar Woodland' and 'Eucocc Open Forest' vegetation units. The potential roosting habitat available for black cockatoos equates to approximately 0.606 ha which is 95.51% of the black cockatoo habitat identified within the survey area (see Table 8).

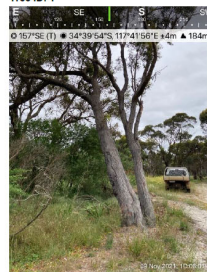


Table 9: Significant trees (&gt;500mm DBH) containing hollows or with hollow bearing potential identified.

Tree ID	Species	DBH (mm)	Crown Senescent	Hollows Present	Location	Size of Entrance	Type of Entrance	Height Above Ground	Rubbing or Chewing Around Entrance	Comments	Eastings	Northing
1	<i>Corymbia calophylla</i>	581	No	Yes	Trunk	18 x 16	Chimney	12	Yes	Brushtail possum activity up trunk. Two additional hollows in trunk & branch. Potential Black Cockatoo & Corella hollow with past but no recent evidence of occupation.	-34.66517293	117.6991561
2	<i>Eucalyptus marginata</i>	482	No	Yes	Branch	4 x 5	Chimney	8	No	Possible small arboreal mammal hollow (likely <i>Antechinus flavipes</i> ), brushtail possum activity up trunk. Not a suitable Black Cockatoo hollow.	-34.66518846	117.6989425
3	<i>Eucalyptus marginata</i>	507	Yes	Yes	Branch	3 x 4	Elbow	10	No	Not a suitable Black Cockatoo hollow. Tree has hollow base, long-term stability / viability questionable.	-34.6650384	117.6989827
4	<i>Corymbia calophylla</i>	747	No	Yes	Branch	6 x 8	Chimney	12	No	Brushtail possum activity up trunk, with additional hollow forming in lower branch. Future potential Black Cockatoo hollow.	-34.6658119	117.6990853
5	<i>Eucalyptus occidentalis</i>	599	Dead	Yes	Trunk	12 x 15	Side	10	No	Potentially suitable Black Cockatoo hollow, no recent or past evidence of use. Dead tree.	-34.66904883	117.7003989
6	<i>Corymbia calophylla</i>	1020	No	Yes	Branch	15 x 12	Elbow	9	Yes	Occupied by brushtail possum, heavy track leading up to hollow. Multiple hollows forming. Not suitable for Black Cockatoo due to limited internal dimensions.	-34.66465142	117.6989721



Tree ID: 1

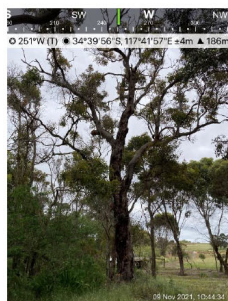


Tree ID: 2

Figure 10: Significant trees and hollow images identified during the survey period.



Tree ID: 3

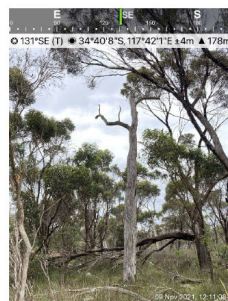


Tree ID: 4



Tree ID: 6

Figure 10 continued.

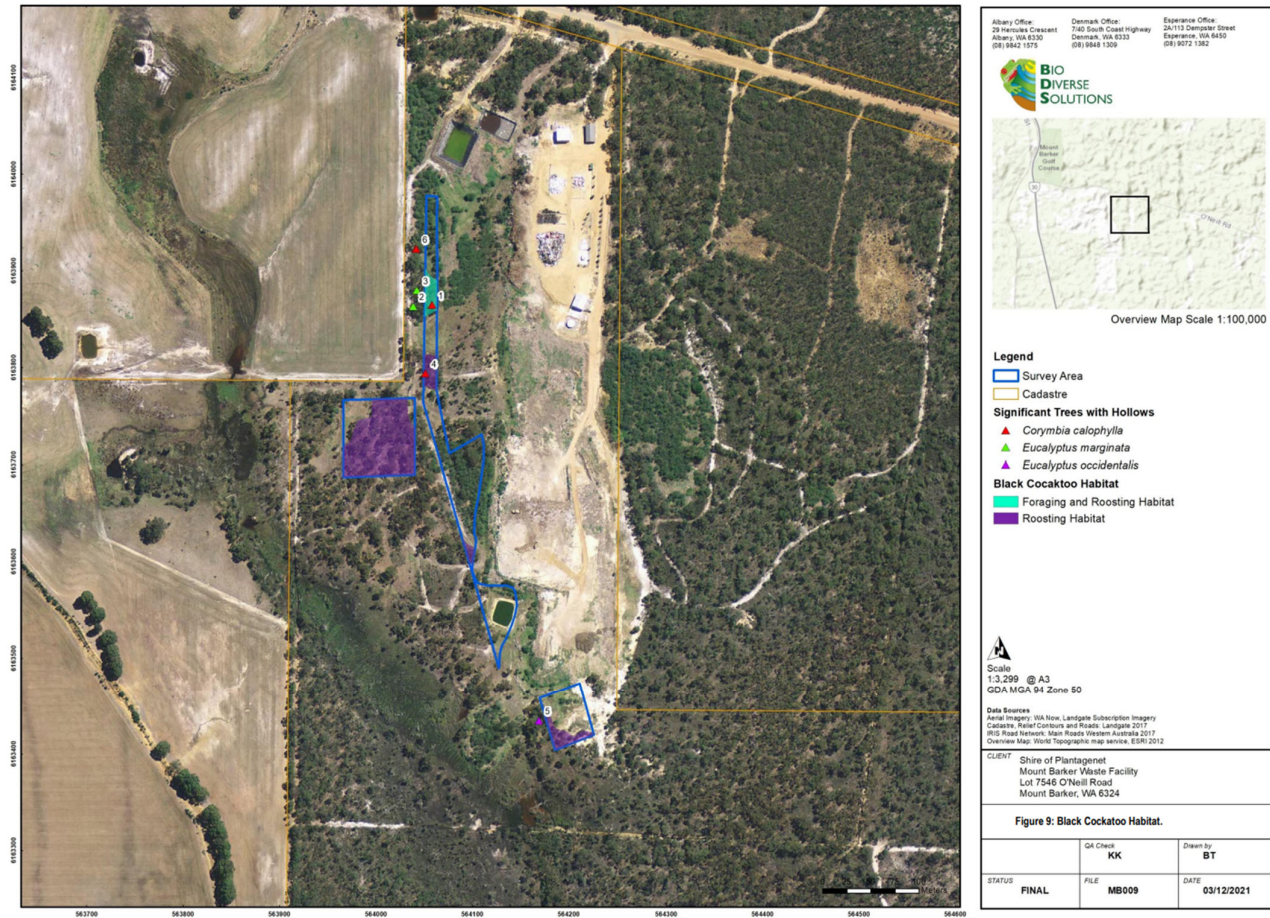


Tree ID: 5



\*Note only trees 1 and 4 are within the application area CPS 9906/1













Hollow bearing tree ID 1: *Corymbia calophylla*. Brushtail possum activity up trunk. Two additional hollows in trunk & branch. Potential Black Cockatoo & corella hollow with past but no recent evidence of occupation. Chew marks around the entrance. Size of entrance is 18 x 16.





Hollow bearing tree ID 1.



Hollow bearing tree ID 4: *Corymbia calophylla*. Brushtail possum activity up trunk, with additional hollow forming in lower branch. Future potential Black Cockatoo hollow. No chewing around the hollow entrance.

## Appendix F. Sources of information

### F.1. GIS databases

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://www.data.wa.gov.au)):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)



- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

#### Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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