GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 7948/1
Permit Holder:	PMR Quarries Pty Ltd
Duration of Permit:	23 June 2018 – 23 June 2023

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

PART I – CLEARING AUTHORISED

1. **Purpose for which clearing may be done**
   Clearing for the purpose of extractive industry.

2. **Land on which clearing is to be done**
   Lot 2233 on Deposited Plan 119592.

3. **Area of Clearing**
   The Permit Holder must not clear more than 22.553 hectares of native vegetation within the area shaded yellow on attached Plan 7948/1.

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. **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.

PART II – MANAGEMENT CONDITIONS

6. **Wind erosion management**
   The Permit Holder shall not clear native vegetation unless sand extraction begins within three months of the clearing being undertaken.

7. **Dieback and weed control**
   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.

PART III - RECORD KEEPING AND REPORTING

8. Records must be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit, in relation to the clearing of native vegetation authorised under this Permit:

(a) 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;
(b) the date that the area was cleared; and
(c) the size of the area cleared (in hectares).
(d) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 5 of this Permit;
(e) actions taken to manage the risk of wind erosion in accordance with condition 6 of this Permit; and
(f) actions taken to manage the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 7 of this Permit.

9. 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 8 of this Permit; and
  (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding year.
(b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding year, 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 23 March 2018, the Permit Holder must provide to the CEO a written report of records required under condition 8 of this Permit where these records have not already been provided under condition 9(a) of this Permit.

DEFINITIONS

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

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;

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.

Emma Bramwell
A/ MANAGER
CLEARING REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

28 May 2018

Plan 7948/1

Legend

Areas approved to clear cadastre

Cadastre

WANow_Imagery

N

0 100 200 m

MGA 94
Geocentric Datum of Australia 1994

E BRAMWELL Date 28/05/18

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.: CPS 7948/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: PMR Quarries Pty Ltd
Application received date: 15 January 2018

1.3. Property details

Property: Lot 2233 on Deposited Plan 119592
Local Government Authority: Shire of Chittering
Localities: Muchea

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
22.553		Mechanical Removal	Extractive industry

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 28 May 2018
Reasons for Decision: The clearing permit application was received on 15 January 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* (EP Act). It has been concluded that the proposed clearing may be at variance to clearing principle (d) and is not likely to be at variance to the remaining clearing principles.

The Delegated Officer determined that the proposed clearing may impact on vegetation that may be necessary for the maintenance of a threatened ecological community, may impact on adjacent remnant vegetation through the introduction or spread of weeds and dieback, and may cause wind erosion.

In determining to grant a clearing permit subject to conditions to manage these impacts, the Delegated Officer determined that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

2. Site Information

Clearing Description: The application is to clear approximately 22.553 hectares of native vegetation within Lot 2233 on Plan 119592, Muchea, for the purpose of facilitating the extraction of sand resources to support the construction of the Perth to Darwin Highway (Figure 1).

Vegetation Description: The application area has been mapped within the following vegetation associations (Heddle et al 1980):

- Bassendean Complex-North: Vegetation ranges from a low open forest and low open woodland of *Banksia* species *Eucalyptus todtiana* (Pricklybark) to low woodland of *Melaleuca* species and sedgelands which occupy the moister sites (approximately 93.2 per cent / 21.015 hectares of the application area); and
- Bassendean Complex-North Transition: A transition complex of low open forest and low woodland of *Banksia* species – Pricklybark on a series of high sand dunes; the understorey species reflect similarities with both the Bassendean-North and Karrakatta-North vegetation complexes (approximately 6.8 per cent / 1.538 hectares of the application area).

In support of the application, the applicant provided a Biodiversity Management and Closure Plan prepared by Landform Research, which references flora and vegetation assessments conducted within a study area which incorporated the application area on 31 August 2016 and 22 August 2017 (Landform Research 2017). The Biodiversity Management and Closure Plan states that the vegetation within the application area was originally typical of the Bassendean Complex – North, and was originally *Banksia* Shrubland to Woodland and probably had affinities to floristic community types 23a, 22, 21c and 21a (Landform Research 2017). The Biodiversity Management and Closure Plan states that the vegetation has previously been cleared and currently comprises regrowth native vegetation (*Banksia* woodland) along with planted *Pinus pinaster* (Maritime Pine) (Landform Research 2017).

A site inspection of the application area was undertaken by officers from the Department of Water and Environment Regulation (DWER) on 14 December 2017. The site inspection identified the following vegetation community in the application area: an open woodland of *Pinus pinaster*, with emergent *Banksia menziesii* (Firewood Banksia), *Banksia attenuata* (Candlestick Banksia), *Banksia ilicifolia* (Holly-leaved Banksia), and sparse *Nuytsia floribunda* (Australian Christmas Tree) over a disturbed sparse shrubland including *Verticordia nitens* (Morrison Featherflower), *Adenanthos cygnorum* (Common Woollybush), *Beaufortia elegans* (Elegant Beaufortia), *Jacksonia floribunda* (Holly Pea), *Calytrix flavescens* (Summer Starflower), *Xanthorrhoea preissii* (Grass Tree), *Stirlingia latifolia* (Blueboy), *Melaleuca seriata* (Sketch Veg), *Myrtaceae* sp., *Macrozamia* sp., and *Scaevola* sp. (DWER 2017).

Vegetation Condition:

The vegetation within the application area is in the following condition:

- Good: Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it (Keighery 1994); to
- Degraded: Basic vegetation structure severely impacted by disturbance. Scope for regeneration, but not to a state approaching good condition without intensive management (Keighery 1994).

The condition of the vegetation was determined from the applicant's Biodiversity Management and Closure Plan (Landform Research 2017), and confirmed during the site inspection (DWER 2017). The site inspection found the vegetation to be predominantly in Degraded (Keighery 1994) condition (DWER 2017).

Soil/Landform type:

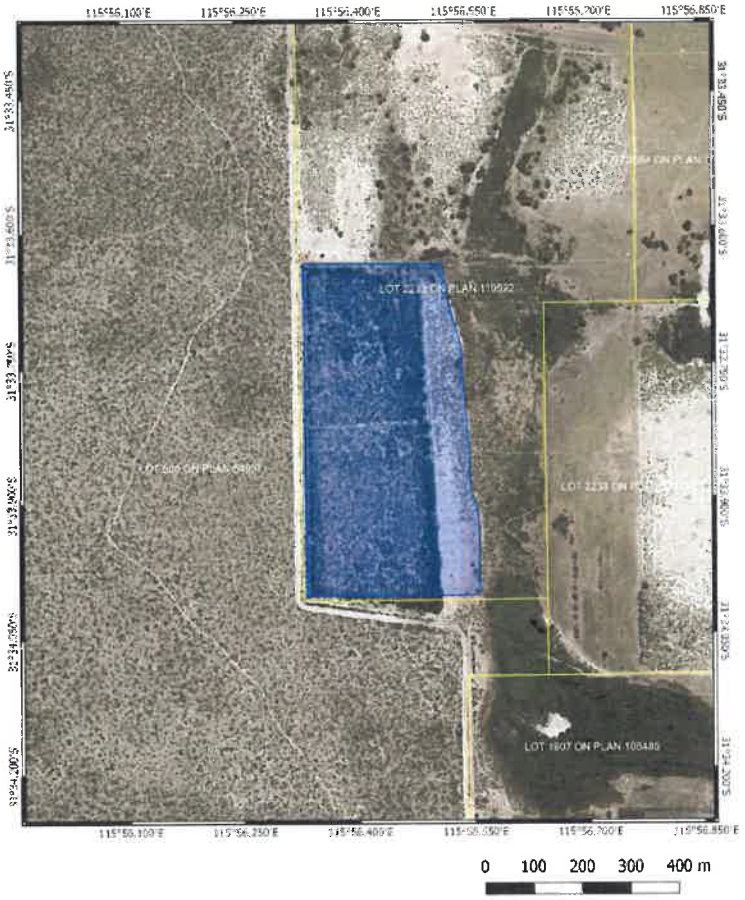
The application area is mapped as occurring within the following land systems (Department of Primary Industry and Regional Development 2017):

- Yanga 14x Phase: Sandy rises on flat to gently sloping plain with occasional low dunes; pale sands overlying siliceous / humic pans, bog iron and clay;
- Yanga 9x Phase: Flat plain with occasional low dunes; subject to seasonal inundation. Humic and peaty sands, wet and semi-wet soils generally underlain by siliceous / humic pans at depth;
- Bassendean, Jandakot Phase: Jandakot low dunes. Slopes <10% and generally more than five metres relief; grey sand over pale yellow sands generally underlain by humic and iron podsols; and
- Bassendean, Jandakot steep phase: Jandakot dune ridges. Slopes <15% and usually more than 10 metres relief; grey medium sand overlying pale yellow sands generally underlain by humic and iron podsols.

Comment:

The local area referred to in this assessment is defined as the area within a 10 kilometre radius of the application area. The local area retains approximately 60 per cent (approximately 20,271 hectares) of native vegetation cover.

Figure1: Overview of the application area (the area cross-hatched blue) in relation to the Lot boundaries (shown in yellow).



Photographs of application area

Figure 2: Typical vegetation within the northern portion

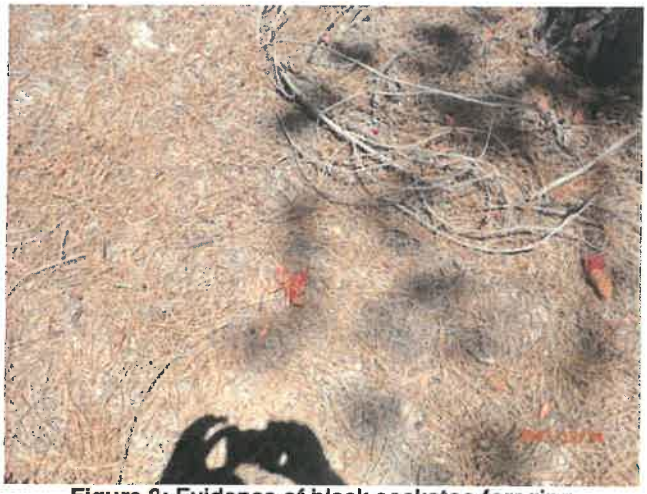


Figure 3: Evidence of black cockatoo foraging

Figure 4: Typical vegetation within the central portion

Figure 5: Typical vegetation within the central portion

Figure 6: Typical vegetation within the southern portion

Figure 7: Typical vegetation within the southern portion

3. Minimisation and mitigation measures

The Biodiversity Management and Closure Plan states that the application area has been located within a Degraded (Keighery 1994) *Banksia* Woodland community which was noted as having a low diversity of native flora species, and that it has been set back approximately 25 metres from the western and southern boundaries for revegetation (Landform Research 2017). The Biodiversity Management and Closure Plan states that weed and dieback management practices will be implemented during the course of the sand extraction activities, that environmental and rehabilitation procedures are proposed, and that management plans have been prepared to minimise potential environmental impacts (Landform Research 2017).

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 not likely to be at variance to this Principle

As discussed in Section 2, the application area is situated in a *Banksia* woodland community in Degraded (Keighery 1994) condition. The site inspection found that the vegetation within the application area comprises *Pinus pinaster* with emergent *Banksia* species over a disturbed sparse shrubland (DWER 2017).

The Biodiversity Management and Closure Plan noted the low flora species diversity apparent within the application area (Landform Research 2017). The Biodiversity Management and Closure Plan states that 646 flora species have been recorded within 10 kilometres of the broader study area, with the highest representation noted in the families Myrtaceae (60), Fabiaceae (49), Proteaceae (41), Stylidiaceae (24), Ericaceae (22), Asteraceae (20) and Poaceae (20), and that 44 conservation significant flora species potentially occur within the local area (Landform Research 2017).

A review of available databases determined that two Priority 1 flora species, eight Priority 2 flora species, 13 Priority 3 flora species and nine Priority 4 flora species have been recorded in the local area (Western Australian Herbarium 1198-). Based on the habitat preferences and ranges of the remaining priority flora species, and noting the soil and vegetation types within the application area, the application area may comprise suitable habitat for the following priority flora species:

- *Anigozanthos humilis* subsp. *chrysanthus* (Priority 4) is known from 57 records from the Avon Wheatbelt, Geraldton Sandplains, Jarrah Forest and Swan Coastal Plain Interim Biogeographic Regionalisation of Australia (IBRA) Regions from various habitats (Western Australian Herbarium 1998-). The nearest recorded occurrence of this species is situated approximately 9.8 kilometres from the application area;
- *Hypolaena robusta* (Priority 4) is known from 46 records from the Geraldton Sandplains, Jarrah Forest and Swan Coastal Plain IBRA regions from various soil types, landscape positions and habitats (Western Australian Herbarium 1998-). The nearest recorded occurrence of this species is situated approximately 6.8 kilometres from the application area;
- *Platysace ramosissima* (Priority 3) is known from 15 records from the Geraldton Sandplains, Jarrah Forest and Swan Coastal Plain IBRA regions from various soil types, landscape positions and habitats. The nearest recorded occurrence of this species is situated approximately 6.4 kilometres from the application area;
- *Schoenus griffinianus* (Priority 4) is known from 38 records the Avon Wheatbelt, Geraldton Sandplains and Swan Coastal Plain IBRA regions from various soil types, landscape positions and habitats. The nearest recorded occurrence of this species is situated approximately 8.8 kilometres from the application area;
- *Styphelia filifolia* (Priority 3) is known from 36 records from the Geraldton Sandplains and Swan Coastal Plain IBRA regions from various soil types, landscape positions and habitats. The nearest recorded occurrence of this species is situated approximately 7.3 kilometres from the application area;
- *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) is known from 16 records from the Swan Coastal Plain IBRA Region from various soil types and landscape positions. The nearest recorded occurrence of this species is situated approximately 1.8 kilometres from the application area; and
- *Verticordia serrata* var. *linearis* (Priority 3) is known from 21 records from the Jarrah Forest and Swan Coastal Plain IBRA Regions from various soil types. The nearest recorded occurrence of this species is situated approximately 2.9 kilometres from the application area.

A review of available databases determined that seven rare flora species occur within the local area (Western Australian Herbarium 1998-). Noting the composition and condition of the vegetation within the application area, it is unlikely that the application area supports rare flora species The Biodiversity Management and Closure Plan states that no threatened or priority flora species were recorded within the application area (Landform Research 2017). Noting this, and the composition and condition of the vegetation within the application area, it is unlikely that the application area supports rare or priority flora species. Rare flora are discussed further under principle (c).

A review of available databases indicates that the application area may contain suitable habitat for two threatened fauna species, one other specially protected fauna species, one Priority 3 fauna species and one Priority 4 fauna species. Noting the presence of large areas of remnant vegetation in the surrounding environment and the condition of the vegetation within the application area, the application area is unlikely to comprise significant habitat for indigenous fauna, including species of conservation significance. Habitat for fauna is discussed further under principle (b).

The application area is adjacent to extensive remnant vegetation on unallocated Crown land which is listed on the Register of the National Estate archive, and which is contiguous with the Gnangara-Moore River State Forest. The Biodiversity Management and Closure Plan reports weed species within the application area (Landform Research 2017). The proposed clearing may impact on the environmental values of adjacent native vegetation through the introduction and spread of weeds and dieback. Weed and dieback management practices will assist in managing these impacts.

According to available datasets, three priority ecological communities (PEC) occur within the local area (Department of Biodiversity, Conservation and Attractions 2007-). These PECs are:

- the Priority 3 '*Banksia* dominated woodlands of the Swan Coastal Plain IBRA region' PEC, mapped within and adjacent to the application area;
- the Priority 2 'Wooded wetlands which support colonial waterbird nesting areas' PEC, situated approximately 6.3 kilometres from the application area; and
- the Priority 2 '*Banksia* woodland of the Gingin area restricted to soils dominated by yellow to orange sands' PEC, situated approximately 6.8 kilometres from the application area.

The application area is within a mapped occurrence of the '*Banksia* Dominated Woodlands of the Swan Coastal Plain IBRA Region' PEC, which is also listed as an 'Endangered' threatened ecological community (TEC) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Approximately 16.5 hectares (73.16 per cent) of the application area is mapped as this PEC. A review of the available databases has determined that approximately 48 per cent of the local area is mapped as being part of this PEC, and the proposed clearing will impact on approximately 0.14 per cent of this mapped extent. The application area does not meet the minimum patch size and condition thresholds to be classified as part of the PEC/TEC. On this basis, the application area is unlikely to be representative of the PEC.

Given the distance between the application area and the remaining two Priority 2 PECs listed above, no impacts to these PECs are expected to result from the proposed clearing. TECs are discussed further under Principle (d).

Noting that the application area is unlikely to include rare or priority flora species, threatened or priority ecological communities or significant habitat for indigenous fauna, and is adjacent to extensive remnant vegetation that is expected to contain vegetation in better condition than that within the application area, it is considered that the application area is not likely to contain comprise a high level of biological diversity. The proposed clearing is not likely to be at variance to this Principle.

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

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

A review of available databases has determined that 12 fauna species of conservation significance have been recorded within the local area (Department of Biodiversity, Conservation and Attractions 2007-). Excluding marine, freshwater aquatic and migratory species whose preferred habitats do not occur within the application area, and noting the ranges of the remaining species, the application area may comprise suitable habitat for the following species:

- Carnaby's Cockatoo (*Calyptorhynchus latirostris*) (Endangered under the *Wildlife Conservation Act 1950* (WC Act), Endangered under the EPBC Act).
- Western Quoll (*Dasyurus geoffroii*) (Vulnerable under the WC Act, Vulnerable under the EPBC Act).
- Peregrine Falcon (*Falco peregrinus*) (Specially protected under the WC Act).
- Southern Brown Bandicoot (*Isoodon obesulus* subsp. *fusciventer*) (Priority 4).
- Black-striped Snake (*Neelaps calonotos*) (Priority 3).

A review of the Protected Matters Search Tool determined that the following fauna species protected under the EPBC Act could potentially occur in the local area (Department of the Environment and Energy 2018a). Excluding marine, migratory and other species whose preferred habitats do not occur within the application area, the application area may also comprise suitable habitat for the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii* subsp. *naso*) (Vulnerable under the WC Act, Vulnerable under the EPBC Act) (Department of the Environment and Energy 2018a).

Noting the habitat preferences of the above species and the habitat and vegetation types found within the application area, the application area may include suitable habitat for the following species:

- The Western Quoll is largely restricted to the south-west of Western Australia, with small numbers in the Midwest, Wheatbelt and South Coast Regions (Department of Biodiversity, Conservation and Attraction 2017). This species survives mostly in Jarrah *Eucalyptus marginata* forests and woodlands, mallee shrublands and heathland (Department of Biodiversity, Conservation and Attraction 2017).
- The Peregrine Falcon is found in a wide array of habitats ranging from woodlands, open grasslands and coastal cliffs (Department of the Environment and Energy 2018b). They are known to nest on coastal cliffs and in woodland environments where there are no nearby cliff formations (Department of the Environment and Energy 2018b);
- The Southern Brown Bandicoot has a patchy distribution through the Jarrah and Karri forests of South Western Australia, the Swan Coastal Plain and as far inland as Hyden (Department of the Environment and Conservation 2012). The Southern Brown Bandicoot has been translocated to a series of nature reserves to aid this species conservation efforts (Department of the Environment and Conservation 2012). This species prefers scrubby, swamp vegetation providing a dense cover up to one metre in height and often feeds in adjacent forest and woodland that is burnt on a regular basis, and in areas of pasture and cropland lying close to dense cover (Department of the Environment and Conservation 2012). On the Swan Coastal Plain, the Southern Brown Bandicoot is often associated with wetlands (Department of the Environment and Conservation 2012); and
- The Black-striped Snake is a burrowing snake found in the *Banksia* woodlands and sandy areas of the Perth region (Museum of Western Australia 2018).

Noting the type and condition of the vegetation within the application area, and the extent of remnant native vegetation remaining in the local area, the application area is not likely to comprise significant habitat for these species.

Black cockatoos breed in large hollow-bearing trees, generally within woodlands or forests or in isolated trees (Commonwealth of Australia 2012). These species nest in hollows in live or dead trees of *Eucalyptus marginata* (Jarrah), *Eucalyptus gomphocephala* (Tuart), *Corymbia calophylla* (Marri), *Eucalyptus diversicolor* (Karri), *Eucalyptus wandoo* (Wandoo), *Eucalyptus salmonophloia* (Salmon Gum), *Eucalyptus rudis* (Flooded Gum), *Eucalyptus loxophleba* (York Gum), *Eucalyptus accedens* (Powder Bark), *Eucalyptus megacarpa* (Bullich) and *Eucalyptus patens* (Blackbutt) (Commonwealth of Australia 2012). No hollow-bearing trees were identified within the application area during both the flora and vegetation assessment (Landform Research 2017) and the inspection of the application area undertaken by DWER (DWER 2017).

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* spp., *Hakea* spp. and *Grevillea* spp. (Commonwealth of Australia 2012). Both the Biodiversity Management and Closure Plan (Landform Research 2017) and the site inspection (DWER 2017) identified the presence of native flora species utilised by black cockatoo species for foraging in the application area (Figure 3). Consequently, the application area likely comprises suitable foraging habitat for these species. However, It should be noted that most evidence of black cockatoo foraging in the application area found during the site inspection determined these species were preferentially selecting the fruiting bodies of Maritime Pine. Given the condition of the vegetation in the application area, the preferential selection of Maritime Pine in the application area by black cockatoo species and the widespread occurrence of the '*Banksia* woodlands of the Swan Coastal Plain IBRA Region' ecological community adjacent to the application area which is expected to offer higher quality foraging habitat for black cockatoo species than that found in the application area, the application area is unlikely to comprise significant habitat for these species.

Based on the above, the application area is unlikely to comprise the whole or a part of, or be necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia, including conservation significant species. The proposed clearing is not likely to be at variance to this Principle.

(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

A review of available databases has determined that seven rare flora species have been recorded in the local area (Western Australian Herbarium 1998-). Based on the habitat preferences and ranges of these species, and the habitat and vegetation types found within the application area, the application area may comprise suitable habitat for four rare flora species:

- The first species is known from 17 records from the Swan Coastal Plain IBRA Region from dry white and grey sand, dry yellow-brown and yellow-orange gravel-sands on slopes (Western Australian Herbarium 1998-). The closest recorded occurrence of this species is approximately 8.5 kilometres from the application area (Western Australian Herbarium 1998-).
- The second species is known from 10 records from the Swan Coastal Plain IBRA Region from various habitat types and landscape positions (Western Australian Herbarium 1988-). The closest recorded occurrence of this species is approximately 8.5 kilometres from the application area (Western Australian Herbarium 1998-).
- The third species is known from 41 records from the Jarrah Forest and Swan Coastal Plain IBRA Regions from various habitat types and landscape positions (Western Australian Herbarium 1988-). The closest recorded occurrence of this species is approximately 14.7 kilometres from the application area.
- The fourth species is known from 6 records from the Geraldton Sandplains and Swan Coastal Plain IBRA Regions from dune topography with dry white sand, low woodland, *Banksia* sp. woodlands and sandy rises with moist grey sand (Western Australian Herbarium 1998-). The closest recorded occurrence of this species is approximately 12.5 kilometres from the application area.

The Biodiversity Management and Closure Plan states that no threatened flora species were recorded within the application area (Landform Research 2017). Noting this, and the composition and condition of the vegetation within the application area, it is unlikely that the application area supports these rare flora species.

Given the above, the application area is unlikely to include, or be necessary for the continued existence of, rare flora. 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 may be at variance to this Principle

According to available datasets, four TECs occur within the local area (Department of Biodiversity, Conservation and Attractions 2007-). These TECs are:

- 'Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)' TEC (critcially endangered), situated approximately three kilometres from the application area;
- 'Shrublands and woodlands on Muchea Limestone' TEC (critcially endangered), situated approximately 3.6 kilometres from the application area;
- '*Banksia attenuata* woodlands over species rich dense shrublands' TEC (endangered), situated approximately 8.8 kilometres from the application area; and
- 'Herb rich saline shrublands in clay pans' TEC (vulnerable), situated approximately 9.2 kilometres from the application area.

As discussed under Principle (a), the majority of the application area is within the Commonwealth-listed TEC '*Banksia* Dominated Woodlands of the Swan Coastal Plain IBRA Region'.

The Approved Conservation Advice for this TEC specifies a number of criteria for vegetation to be considered representative of this TEC (Threatened Species Scientific Committee 2016). These criteria include the situation of the vegetation on sandplain landforms, a structure of low woodland or forest, the presence of a dominant Banksia component which includes at least one of Candlestick Banksia, Firewood Banksia, *Banksia prionotes* (Acorn Banksia) and/or *Banksia ilicifolia* (Holly-leaved Banksia), with/without the presence of emergent medium-height trees comprised of species including *Eucalyptus* spp. or *Allocasuarina* spp., with a species-rich schlerophyllous understorey and a herbaceous ground layer (Threatened Species Scientific Committee 2016). These criteria also specify minimum patch sizes and condition ratings, which stipulate a requirement that a patch should meet at least a 'Good' (Keighery 1994) condition rating, and a minimum patch size of two hectares for vegetation in 'Good' (Keighery 1994) condition (Threatened Species Scientific Committee 2016).

As outlined in Section 2, the vegetation community identified within the application area includes Candlestick Banksia, Firewood Banksia and Holly-leaved Banksia over a mixed shrubland on a sandy soil. On this basis, the application area appears to meet the key diagnostic requirements for the '*Banksia* Dominated Woodlands of the Swan Coastal Plain IBRA Region' TEC in regard to soil and landform, structure, and vegetation composition. However, on the basis of the proportion of the application area that comprises patches of vegetation in 'Good' (Keighery 1994) condition, the application area does not meet the minimum patch size and condition thresholds to be classified as part of the TEC. Notwithstanding, as discussed in Principle (a), the application area is situated adjacent to mapped occurrences of the '*Banksia* Woodlands of the Swan Coastal Plain IBRA Region' TEC. Noting this, the application area may be necessary for the maintenance of an adjacent occurrence of this TEC.

Given the above, the application area is not likely to comprise the whole or a part of a TEC, however may be necessary for the maintenance of a TEC. The proposed clearing may be at variance to this Principle. Weed and dieback management practices will assist in managing impacts to the adjacent vegetation.

(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 national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001).

As indicated in Table 1, the Swan Coastal Plain bioregion, the Shire of Chittering and the mapped vegetation association are above the recommended 30 per cent retention threshold. As outlined in Section 2, the local area retains approximately 60 per cent (approximately 20,271 hectares) of native vegetation cover. The application area represents less than 0.2 per cent of the current extent of remnant native vegetation within the local area.

As discussed under Principles (a), (b), (c) and (d), the application area may comprise a high level of biological diversity, however is unlikely to comprise significant habitat for indigenous fauna including conservation significant species, or be necessary for the maintenance for rare flora species, or comprise a TEC (although it may be necessary for the maintenance of a TEC). The application area is adjacent to remnant native vegetation in similar or better condition than that found within the application area (Figure 1).

Given the above, the application area is unlikely to be significant as a remnant of native vegetation in an area that has been extensively cleared. The proposed clearing is not likely to be at variance to this Principle.

Table 1: Vegetation Extents

	Pre-European	Current Extent	Remaining	Current Extent in DCBA Managed Lands	
	(ha)	(ha)	(%)	(ha)	(%)
IBRA Bioregion					
Swan Coastal Plain	1,501,221.93	578,997.37	38.57	222,766.51	38.47
Local government authority					
Shire of Chittering	121,834.30	45,355.32	38.05	5,250.44	11.33
Heddle vegetation complex in IBRA Region					
Bassendean Complex-North	79,057.35	56,575.80	71.56	30,546.00	38.64
Bassendean Complex-North Transition	20,856.54	18,527.58	88.83	11,275.64	54.06

(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 a review of avalaible databases, no surface water features occur within the application area. The absence of surface water features in the application area was confirmed during the site inspection (DWER 2017). Noting the composition of the vegetation within the application area, it is considered that the proposed clearing impacts typically terrestrial flora species that occur within a variety of habitats and are not reliant on the presence of wetlands or watercourses.

The application area is adjacent to a mapped 'Resource Enhancement' dampland and sumpland, which is contiguous with portions mapped as 'Multiple Use' wetlands. A review of aerial photography of the application area and its surrounds has found that distincitive vegetation communities are associated with the dampland and sumpland, however the proposed clearing is located further upslope and is not likely to directly impact on the vegetation growing in association with them.

Notwithstanding, the proposed clearing, whilst not directly impacting the vegetation associated with the adjacent wetland, could lead to edge effects and the introduction and spread of weeds and dieback into the riparian vegetation. On this basis, the proposed clearing may impact on vegetation growing in association with a wetland. The proposed clearing may be at variance to this Principle. Weed and dieback management measures will assist in managing impacts to the adjacent vegetation.

(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

As outlined under Section 2, the application area is situated within the Bassendean Jandakot Phase, Bassendean Jandakot Steep Phase, Yanga 14x Phase and Yanga 9x Phase land systems (Department of Primary Industry and Regional Development 2017). These land systems have a moderate to high risk of wind erosion, water logging, water repellence, subsurface acidification, phosphorous export and flooding, a moderate risk of soil salinity, a low to moderate risk of water erosion and a low risk of subsurface compaction (Department of Primary Industry and Regional Development 2017).

Approximately 95.1 per cent of the application area is situated within the Bassendean Jandakot Steep Phase land system. This land system has a high risk of wind erosion, water repellence and phosphourous export, a moderate risk of salinisation and a low risk of waterlogging, water erosion, subsurface compaction and acidification and flooding (Department of Primary Industry and Regional Development 2017).

The site inspection did not identify any evidence of existing land degradation impacts within the application area (DWER 2017).

Noting the extent of the proposed clearing extent, the sandy soils present across the majority of the application area, and the risk of wind erosion associated with the Bassendean Jandakot Steep Phase land system, the proposed clearing may result in wind erosion. Noting the position of the application area between land cleared for agricultural purposes and remnant vegetation, alongside the condition of the vegetation within the application area, and having regard for the purpose of the proposed clearing, any wind erosion resulting from the proposed clearing is expected to be short-term. Notwithstanding, limiting the length of time soils are left exposed will assist in managing this risk.

While the application areas soils experience a high risk of water repellence and phosphourous export and a moderate risk of salinisation, the sand mining activities will remove the sand-dune landform the application area is situated on, leaving the underlying soils for the establishment of pasture flora species (Landform Research 2017). The inspection of the study area undertaken by DWER did not identify any evidence of land degradation resulting from past clearing campaigns (DWER 2017).

Given the above, the proposed clearing may result in wind erosion in the short-term, however is unlikely to cause appreciable land degradation. 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 is situated approximately three kilometres northwest of an unnamed nature reserve, 4.2 kilometres east of the Gnangara-Moore River State Forest, 6.3 kilometres south-southwest of the Chandala Nature Reserve, nine kilometres southwest of the Barracca Nature Reserve, 9.4 kilometres north of the Neaves Road Nature Reserve and nine kilometres northwest of the Bullsbrook Nature Reserve. A number of privately-managed conservation areas occur within the local area, the nearest of these being approximately three kilometres from the application area.

Noting the separation distances and the presence of remnant native vegetation and existing agricultural land uses between the application area and these conservation areas, the proposed clearing is not likely to impact on the environmental values of these conservation areas. Noting the extent of remnant native vegetation in the local area, the application area is also not likely to be crucial to the interconnectivity of these conservation areas, and the proposed clearing is unlikely to impact upon the biodiversity and species recruitment of these conservation areas.

Based on the above, the proposed clearing is unlikely to impact on the environmental values of any conservation areas. 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

As discussed in Principle (g), the Bassendean Jandakot Steep Phase Land System has a low risk of water erosion, which can lead to the sedimentation of surface water flows (Department of Primary Industry and Regional Development 2017). Furthermore, as discussed in Principle (f), the application area is devoid of surface water features. Noting the above and in consideration of the knowledge that the sandy soils will be removed during the sand mining campaign, the potential for the sedimentation of surface water flows to result from the proposed clearing is expected to be minimal. On this basis, the proposed clearing is unlikely to result in any significant long-term deterioration in surface water quality.

Noting the extent of native vegetation cover in the local area and the presence of existing cleared areas on the property for agricultural activities, the proposed clearing is not anticipated to cause deterioration in the quality of underground water resources.

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

As discussed in Principle (g), the Bassendean Jandakot Steep Phase Land System shows a low potential for flooding (Department of Primary Industry and Regional Development 2017). The sandy soils found in the application area are also known to disperse rainfall into the underlying soil profile and exhibit low water holding capacity (Landform Research 2017). In addition, a review of the application area and its surrounds using aerial photography did not identify any evidence that previous clearing activities on the property the subject of this clearing permit application have changed the local areas flooding regime.

As discussed in Principle (f), the application area is devoid of surface water features. A review of the topographic contours of the local area found that the local area has relatively consistent topography. The sand dune on which the application area is situated on is proposed to be excavated, and the resulting topography would be consistent with the surrounding farmland (Landform Research 2017). Noting these factors, it is expected that surface water accumulation within, and runoff outside, of the application area as a result of the proposed clearing will be limited, and that there will be no changes to the local flooding regime.

Given the above, the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding. The proposed clearing is not likely to be at variance to this Principle.

Planning instruments and other relevant matters.

The application area was originally included in an application to clear 57.4 hectares of native vegetation (reference CPS 7806/1). During assessment of application CPS 7806/1, the applicant requested that the application be revised to exclude a 22.6 hectare portion of that application area (which is the subject of the current application) due to identified potential environmental values within that portion which required more detailed assessment.

The application area is situated within the Basic Raw Materials Policy boundary area, designated by the Western Australian Planning Commission in *Statement of Planning Policy 2.4: Basic Raw Materials.* The objectives of this policy are to:

- identify the location and extent of known basic raw material resources;
- protect Priority Resource Locations, Key Extraction Areas and Extraction Areas from being developed for incompatible land uses which could limit future exploitation;
- ensure that the use and development of land for the extraction of basic raw materials does not adversely affect the environment or amenity in the locality of the operation during or after extraction; and
- provide a consistent planning approval process for extractive industry proposals including the early consideration of sequential land uses.

According to the broad mapping contained in the above policy, the application area is not situated within a designated 'Priority Resource Location' or a 'Key Extraction Area', however appears to be identified as an 'Extraction Area' (WAPC 2000). The policy states that Extraction Areas "are existing extractive industries operating under the *Mining Act 1978*, the *Local Government Act 1996*, a regional planning scheme or a town planning scheme" and "should be protected in the short term but will eventually be replaced by other uses or reserves" (WAPC 2000).

The Biodiversity Management and Closure Plan states that the proposed final landuse of the application area post sand mining is to support pasture species used for cattle grazing (Landform Research 2017). The Biodiversity Management and Closure Plan states that the proposed sand mining operation will reduce the soil profile over the local groundwater resources to between 0.5 and one metres above the winter water table, increasing the area's potential for pasture species culitvation, that the floor of the application area will be graded and deep ripped to gradients between 1:5 and 1:10 to faccilitate productive agricultural use, and that the final landform and land eleveation will be consistent with other areas on the property (Landform Research 2017). The Biodiversity Management and Closure Plan states "Sand will be removed in a sequence with vegetation cleared, topsoil pushed to the perimeter for later use and perimeter bunds formed from the small thickness of overburden.

As outlined in Section 3, the Biodiversity Management and Closure Plan states that a 25 metre buffer of replanted native vegetation will be established along the western and southern boundaries of the application area to buffer adjacent remnant vegetation (Landform Research 2017). This area is proposed to be replanted with trees and shrubs established within two rows approximately three metres apart to a density of 1,000 stems per hectare, using the native species *Allocasuarina fraseriana* (Sheoak), Marri, Jarrah, Pricklybark, Candlestick Banksia, Firewood Banksia, Holly-leaved Banksia, *Acacia pulchella* (Prickly Moses), *Acacia saligna* (Orange Wattle), *Kunzea glabrescens* (Spearwood), *Jacksonia furcellata* (Grey Stinkwood), *Jacksonia sternbergiana* (Stinkwood) and *Hakea prostrata* (Harsh Hakea) (Landform Research 2017).

The applicant provided a copy of the 'Planning Consent Application – Extractive Industry', dated 28 June 2017, received from the Shire of Chittering (PMR Quarries Pty Ltd 2018). Condition 16 of this document states that the applicant "is to obtain a Clearing Permit from the Department of Environment and Regulation (now DWER) prior to an extractive industry licence being granted". The grant of a clearing permit does not absolve the applicant from the requirements of other laws administered by Local, State or Federal Government.

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the DWER website on 5 March 2018 with a 21 day submission period. No public submissions have been received in relation to this application.

5. References

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GIS Databases:

- Aboriginal Sites of Significance
- Department of Biodiversity, Conservation and Attractions, Tenure
- Hydrography, Basins
- Hydrography, Geodata
- Hydrography, Hierarchy
- Hydrography, Hydro Lines
- Hydrography, Swan Waterbodies
- Hydrography, Swan Drainage Lines
- Hydrography, Geomorphic Wetlands Swan Coastal Plain (Classification)
- Hydrography, Linear
- Remnant Vegetation
- SAC bio datasets
- Soils, Statewide
- Swan Contours (50m)