GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	8632/1
Permit Holder:	Process Minerals International Pty Ltd
Duration of Permit:	From 12 January 2020 to 12 January 2030

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

PART I - CLEARING AUTHORISED

1. Land on which clearing is to be done

Mining Lease 15/717
Mining Lease 15/1000
Miscellaneous Licence 15/220
Miscellaneous Lease 15/360
Miscellaneous Lease 15/376
Miscellaneous Lease 15/392
Lot 105 on Deposited Plan 40396, Karramindie
Coolgardie-Esperance Highway road reserve (PIN: 11331602), Karramindie

2. Purpose for which clearing may be done

Clearing for the purpose of mineral production and associated infrastructure.

3. Area of Clearing

The Permit Holder must not clear more than 600 hectares of native vegetation. All clearing must be within the areas cross-hatched yellow and cross-hatched red on attached Plan 8632/1.

4. Period in which clearing is authorised

The Permit Holder shall not clear any native vegetation after 12 January 2025.

5. Staged Clearing

The Permit Holder shall not clear native vegetation unless the purpose for which the clearing is authorised is enacted within three months of the clearing being undertaken.

6. 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.

PART II – MANAGEMENT CONDITIONS

7. 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.

8. 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*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
(b) ensure that no *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.

9. Direction of clearing

The Permit Holder shall conduct clearing in a slow, progressive manner from west to east to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

10. Malleefowl management

(a) Prior to undertaking any clearing authorised under this Permit, the Permit Holder shall engage a *fauna specialist* to conduct a *fauna survey* within the area cross-hatched red on Plan 8632/1 to identify *Leipoa ocellata* (malleefowl) mounds and *Leipoa ocellata* (malleefowl) *critical habitat*.

(b) Prior to undertaking any clearing authorised under this Permit, the Permit Holder shall provide the results of the *fauna survey* in a report to the CEO.

(c) The *fauna survey* report must include;

(i) the location of each *Leipoa ocellata* (malleefowl) mound, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees, to the CEO.
(ii) the location of the *Leipoa ocellata* (malleefowl) *critical habitat*, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees, to the CEO.
(iii) the methodology used to survey the Permit Area and to establish the *Leipoa ocellata* (malleefowl) *critical habitat* and identify the mound/s;
(iv) the extent of the *critical habitat* of the *Leipoa ocellata* (malleefowl) shown on a map; and
(v) a description of the *critical habitat* found.

(d) Where *Leipoa ocellata* (malleefowl) mounds are identified under Condition 10(a) of this Permit, the Permit Holder shall ensure that no clearing of *critical habitat* of the identified *Leipoa ocellata* (malleefowl) mounds occurs, unless first approved by the CEO.

11. Revegetation and rehabilitation

Within Lot 105 on Deposited Plan 40396, Karramindie, the Permit Holder shall:

(a) retain the vegetative material and topsoil removed by clearing authorised under this Permit and stockpile the vegetative material and topsoil in an area that has already been cleared;

(b) within six months following clearing authorised under this permit within Lot 105 on Deposited Plan 40396, Karramindie, *revegetate* and *rehabilitate* the areas that are no longer required for the purpose for which they were cleared under this Permit by:

(i) re-shaping the surface of the land so that it is consistent with the surrounding 5 metres of uncleared land;
(ii) laying the vegetative material and topsoil retained under Condition 11(a) on the cleared area; and
(iii) ripping the ground on the contour to remove soil compaction.

(c) within 4 years of undertaking *revegetation* and *rehabilitation* in accordance with Condition 11(b) of this Permit:

(i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
(ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under Condition 11(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.

PART III - RECORD KEEPING AND REPORTING

12. Records to be kept

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

(a) In relation to the clearing of native vegetation authorised under this Permit,

(i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
(ii) the date that the area was cleared;
(iii) the size of the area cleared (in hectares); and
(iv) purpose for which clearing was undertaken.

(b) Actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with Condition 7 of this Permit;

(c) Actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with Condition 8 of this Permit;

(d) In relation to the *fauna survey* undertaken for malleefowl management pursuant to Condition 10 of this Permit:

(i) the location of each *Leipoa ocellata* (malleefowl) mound, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees, to the CEO;

(ii) the location of the *Leipoa ocellata* (malleefowl) *critical habitat*, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees, to the CEO;
(iii) the methodology used to survey the Permit Area and to establish the *Leipoa ocellata* (malleefowl) *critical habitat* and identify the mound/s;
(iv) the extent of the critical habitat of the *Leipoa ocellata* (malleefowl) shown on a map; and
(v) a description of the *critical habitat* found.

(e) In relation to the *revegetation* and *rehabilitation* of areas pursuant to Condition 11 of this Permit:

(i) the location of any areas *revegetated* and *rehabilitated*, recorded using a Global Positioning System
(GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
(ii) a description of the *revegetation* and *rehabilitation* activities undertaken; and
(iii) the size of the area *revegetated* and *rehabilitated* (in hectares).

13. Reporting

(a) The Permit Holder must provide to the CEO on or before 31 July of each year, a written report demonstrating adherence to all conditions of this permit, and setting out the records required under Condition 12 of this permit in relation to clearing carried out between 1 July and 30 June of the previous financial year.

(b) If no clearing authorised under this Permit was undertaken between 1 July and 30 June of the previous financial year, a written report confirming that no clearing under this permit has been carried out must be provided to the CEO on or before 31 July each year.

(c) Prior to 12 October 2029, the Permit Holder must provide to the CEO a written report of records required under condition 12 of this Permit where these records have not already been provided under condition 13(a) of this Permit.

DEFINITIONS

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

critical habitat means any part of the Permit Area comprising of the habitat of flora or fauna species and its population, that is critical for the health and long term survival of the flora or fauna species and its population;

direct seeding means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species;

environmental specialist means a person who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the CEO as a suitable environmental specialist;

fauna specialist means a person who holds a tertiary qualification specializing in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the CEO as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016* and Biodiversity Conservation Regulations 2018;

fauna survey means a field-based investigation, including a review of established literature, of the biodiversity of fauna and/or fauna habitat of the Permit Area. Where conservation significant fauna are identified in the Permit Area, the survey should also include sufficient surrounding areas to place the Permit Area into local context;

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

local provenance means native vegetation seeds and propagating material from natural sources within 200 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared;

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;

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

rehabilitate/ed/ion means actively managing an area containing native vegetation in order to improve the ecological function of that area;

revegetate/ed/ion means the re-establishment of a cover of *local provenance* native vegetation in an area using methods such as natural *regeneration*, *direct seeding* and/or *planting*, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area;

weed/s means any plant -
(a) that is declared under the section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
(b) published in a Department of Parks and Wildlife Regional Weed Summary, regardless of ranking; or
(c) not indigenous to the area concerned.

Ryan Mincham
2019.12.13
14:00:23
+08'00'

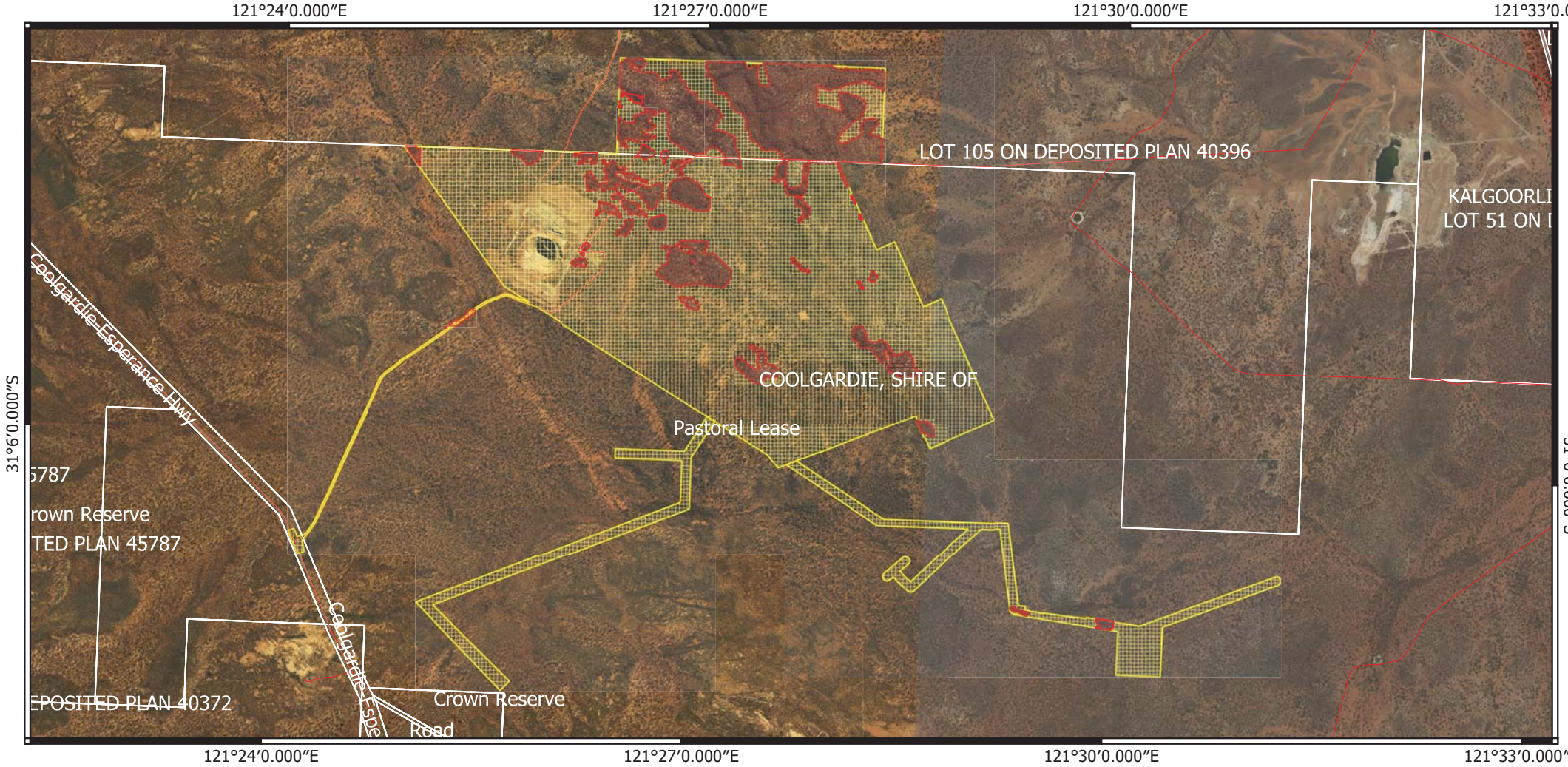
_____

Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

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

13 December 2019

Plan 8632/1



Legend

CPS layers

- CPS areas approved to clear
- CPS subject to conditions

base layers

- Road Centrelines
- Cadastre - LGATE 218

Local Government Authorities

Image

N

0 1 2 3 km

Ryan Mincham
2019.12.13
12:49:08 +08'00'

Officer delegated 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.: 8632/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Process Minerals International Pty Ltd
Application received date: 31 July 2019

1.3. Property details

Property: Coolgardie-Esperance Highway road reserve (PIN: 13331602), Karramindie
Lot 105 on Plan 40396, Karramindie
Mining Lease 15/717
Mining Lease 15/1000
Miscellaneous Lease 15/220
Miscellaneous Lease 15/360
Miscellaneous Lease 15/376
Miscellaneous Lease 15/392

Local Government Authority: Shire of Coolgardie
Localities: Karramindie

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
600		Mechanical Removal	Mineral production

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 13 December 2019

Reasons for Decision:

The clearing permit application was received on 31 July 2019 and has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the *Environmental Protection Act 1986*. It has been concluded that the proposed clearing is at variance with Principle (f), may be at variance with Principles (a), (b) and (g), is not likely to be at variance with Principles (c), (d), (h), (i) and (j), and is not at variance with Principle (e).

Through assessment it has been determined that the proposed clearing may impact habitat for malleefowl (*Leipoa ocellata,* Vulnerable under the *Biodiversity Conservation Act 2016*) and cause appreciable land degradation via wind erosion. A malleefowl management condition requiring targeted surveys prior to clearing will minimise impacts to malleefowl. The implementation of one-directional clearing to allow fauna to move into adjacent habitat will assist in mitigating impacts to fauna species. A condition requiring clearing to occur not more than three months prior to the implementation of the proposed land use will mitigate the potential for wind erosion.

The assessment identified that the proposed clearing will impact on vegetation growing in association with a watercourse. These impacts are not likely to be significant.

The applicant has avoided and minimised impacts through design and utilising existing cleared areas where possible to minimise the requirement for additional clearing.

Given the above, the Delegated Officer decided to grant a clearing permit subject to staged clearing, weed management, fauna management and revegetation and rehabilitation conditions.

2. Site Information

Clearing Description

The application is to clear 600 hectares of native vegetation for the purpose of mineral production, within the properties listed under Section 1.3, of which 150 hectares has previously been approved under CPS 6770/2 (Figure 1).

Vegetation Description

There are five Beard vegetation associations mapped within the application area:

- 9: Medium woodland; coral gum (*Eucalyptus torquata*) & Goldfields blackbutt (*Eucalyptus lesouefii*);
- 128: Bare areas; rock outcrops;

- 522: Medium woodland; redwood (*Eucalyptus transcontinentalis*) & merrit (*Eucalyptus flocktoniae*);
- 936: Medium woodland; salmon gum; and
- 1413: Shrublands; Acacia, Casuarina & Melaleuca thicket (Shepherd et al., 2001).

Six flora and vegetation surveys were undertaken from 2012 to 2018 by Native Vegetation Solutions (NVS), each survey covering a different section of the survey area encompassing approximately 6,326.61 hectares (NVS, 2019). Vegetation groups mapped by NVS within the survey area are as follows (NVS, 2019):

- Transitional Eucalyptus woodland over mixed shrubland (a)
- *Eucalyptus oleosa* and *Eucalyptus lesouefii* over *Melaleuca sheathiana* and *Cratystylis conocephala* (aa)
- *Eucalyptus oleosa* over *Eremophila interstans* over sclerophyll shrubland (ab)
- *Eucalyptus oleosa* over *Triodia scariosa* (ac)
- *Eucalyptus salubris* woodland (ad)
- Mixed Eucalyptus woodland over sclerophyll shrubland on undulating hills (b)
- *Acacia acuminata* shrubland with emergent *Eucalyptus griffithsii* (c)
- Open *Eucalyptus salmonophloia* woodland (d)
- *Eucalyptus salmonophloia* woodland over *Maireana sedifolia* shrubland (e)
- *Eucalyptus salmonophloia* woodland over mixed shrubland (f)
- *Eucalyptus lesouefii* and *E. gracilis* woodland on rocky hill slopes (g)
- Mixed Eucalyptus woodland over *Melaleuca sheathiana* shrubland (h)
- *Eucalyptus ravida* woodland (i)
- *Eucalyptus stricklandii* over Acacia and sclerophyll shrubland (j)
- Mixed Eucalyptus woodland over sclerophyll shrubland with *Diocirea acutifolia* (P3) on undulating hills (k)
- *Melaleuca sheathiana* shrubland with *Eucalyptus oleosa* over *Cratystylis conocephala* (l)
- *Eucalyptus lesouefii* woodland (m)
- *Eucalyptus gracilis* woodland (n)
- *Eucalyptus stricklandii* woodland over Tecticornia open shrubland (o)
- *Eucalyptus transcontinentalis* and *E. campaspe* woodland over *Melaleuca sheathiana* shrubland (p)
- *Casuarina pauper* shrubland with *Eucalyptus lesouefii* over mixed shrubland across greenstone hills (q)
- *Eucalyptus griffithsii* woodland (r)
- *Eucalyptus campaspe* and *E. gracilis* woodland (s)
- *Eucalyptus stricklandii* and *E. lesouefii* woodland over *Beyeria sulcata* (t)
- Transitional Eucalyptus woodland over *Diocirea acutifolia* (u)
- *Acacia gibbosa* shrubland over *Prostanthera grylloana* (w)
- *Acacia quadrimarginea* over Allocasuarina shrubland (x)
- Revegetation Shrubland (y)
- *Eucalyptus oleosa* and *E. griffithsii woodland* (z)

Vegetation Condition

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

To

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

Soil type

The application area is mapped within the following soil systems:

- My154: Undulating country on acid volcanic rocks and sedimentary materials;
- BB5: Rocky ranges and hills of greenstones-basic igneous rocks;
- Mx42: Broad flat to undulating valleys with isolated granitic rock outcrops and some low escarpments; some seasonal lakes and claypans; and
- Mx43: Gently undulating valley plains and pediments; some outcrop of basic rock.

Comment

The vegetation condition was determined via flora and vegetation surveys conducted within the application area (NVS, 2019). The application area includes previously cleared areas currently used for mineral production activities.

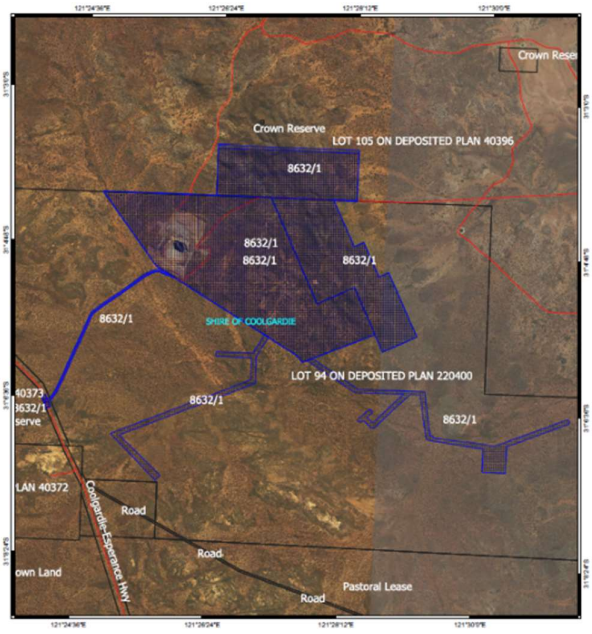


Fig 1: Application area (outlined in blue)

3. Assessment of application against clearing principles

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

Proposed clearing may be at variance with this Principle

The application area occurs in the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. This bioregion is comprised of mallees and shrublands on sandplains, and is rich in endemic eucalypts on low greenstone hills, valley alluvials and calcareous plains, and endemic acacias in the east (Grant et al., 2002). Flora and vegetation surveys conducted by NVS of the application area and its surroundings (the flora survey area) recorded a total of 38 families, 84 genera and 198 species (NVS, 2019). Thirty major vegetation groups were recorded in the flora survey area, and all were considered to be common, widespread and well represented in the Eastern Goldfields subregion (NVS, 2019).

The flora and vegetation surveys undertaken by NVS recorded 28 populations of Priority 3 flora species *Diocirea acutifolia* (NVS, 2019). This species is both widespread and occurs in large numbers throughout the local and regional area, and is well documented from previous flora surveys (NVS, 2019). Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs. Priority 3 flora species are poorly known but do not appear to be under imminent threat, and the proposed clearing is therefore not likely to impact the conservation of *Diocirea acutifolia*.

A review of previous fauna assessments within the application area and its surroundings conducted by Bamford Consulting Ecologists (BCE) identified eight fauna habitats within the area (BCE, 2019). Fauna surveys of the application area have recorded 85 species, including one frog, 10 reptiles, 59 birds, nine native mammals and six introduced mammals (BCE, 2019). The malleefowl, a conservation significant fauna species, has been recorded within the application area based on the finding of mounds. Mounds are most likely to be constructed in shrublands and thickets where dense vegetation provides leaf litter for the mounds, and where the soil is free-draining to some extent (BCE, 2019). Suitable habitat for malleefowl mounds occurs in three of the eight fauna habitats recorded:

- Mixed Eucalypt Woodland on Greenstone hills;
- Dense Acacia shrubland in gullies and slopes of Greenstone hills; and
- Mixed Eucalyptus woodland over sclerophyll shrubland with *Diocirea acutifolia* on undulating hills.

The fauna habitats suitable for malleefowl mounds cover 336.31 hectares of the application area, of which 155.69 hectares are proposed to be undisturbed (BCE, 2019). Potential impacts to malleefowl may be minimised by the implementation of targeted surveys prior to clearing activities, ensuring that critical habitat for this species is not cleared.

No priority or threatened ecological communities (PEC/TEC) have been recorded within the local area (20 kilometre radius). Flora and vegetation surveys conducted by NVS (2019) within the application area did not record any PECs or TECs.

Based on the size of the application area (600 hectares within a footprint of approximately 1,891 hectares) which encompasses numerous vegetation types and fauna habitats, the presence of priority flora species and the potential occurrence of conservation significant fauna species, the proposed clearing may be at variance with 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.

Proposed clearing may be at variance with this Principle

A desktop assessment and review of previous fauna assessments within the application area and its surroundings was undertaken by Bamford Consulting Ecologists (BCE) (2019). Eight fauna habitats were identified within the application area (BCE, 2019):

- Mixed Eucalypt Woodland on Greenstone hills;
- Dense Acacia shrubland in gullies and slopes of Greenstone hills;
- Eucalypt Woodland over mixed shrubs on clay-loam flats;
- Mixed Eucalypt woodland over *Melaleuca sheathiana* on gravelly rises;
- Dense Mallee and Eucalypt woodland associated with minor drainage lines;
- Dense Acacia and Allocasuarina shrubland on sandy clay flats;
- Mixed Eucalyptus woodland over sclerophyll shrubland with *Diocirea acutifolia* on undulating hills; and
- *Casuarina pauper* shrubland with *Eucalyptus lesouefii* over mixed shrubland across greenstone hills.

Most of the application area comprises of intact Eucalypt woodland or mallee over a range of understorey types, ranging from Melaleuca and Acacia thickets, Eremophila shrublands or sparsely vegetated. The habitats recorded within the application area provide fauna habitat and the Eucalypt woodland in particular would provide connectivity between the surrounding woodlands, with fauna being likely to move across the landscape. The implementation of one-directional clearing to allow fauna to move into adjacent habitat will assist in mitigating impacts to fauna species.

Based on a desktop assessment and the findings of the previous fauna assessments, 289 vertebrate fauna species have been identified as potentially occurring in the application area. These fauna species include five frogs, 85 reptiles, 164 birds, 25 native and ten introduced mammals. Fauna surveys of the application area have recorded 85 species including one frog, 10 reptiles, 59 birds, nine native mammals and six introduced mammals (BCE, 2019). The fauna surveys indicate that the area is not noted for high biodiversity relative to the surrounding region (BCE, 2019).

The malleefowl (*Leipoa ocellata*) has been recorded within the application area based on several old to very old mounds (BCE, 2019). The nature of these mounds suggest that malleefowl may no longer nest in the application area, however, the area may be used for foraging (BCE, 2019). As assessed within Principle (a), three of the eight fauna habitats recorded within the area may be suitable for malleefowl mounds. Potential impacts to malleefowl may be minimised by the implementation of targeted surveys prior to clearing activities, ensuring that critical habitat for this species is not cleared.

Roads within the application area may limit movement of small, terrestrial fauna species. However, these effects are localised within the application area and impacts are expected to be negligible to minor.

Given the above, the proposed clearing may be at variance with this Principle.

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

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

According to available databases, there are no known records of Threatened flora within the application area. The flora and vegetation surveys of the application area and surroundings did not record any species of Threatened flora listed under the *Biodiversity Conservation Act 2016* (NVS, 2019).

The vegetation groups recorded in the application area were all considered to be common, widespread and well represented in the Eastern Goldfields subregion (NVS, 2019). The vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened flora.

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

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

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

According to available databases, there are no State listed threatened ecological communities (TECs) within the local area (20 kilometre radius). The vegetation surveys did not identify any vegetation communities considered to be a TEC within the application area (NVS, 2019).

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

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

Proposed clearing is not at variance with 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).

The application area lies within the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 98 per cent of the pre-European vegetation remains (Government of Western Australia, 2018). The vegetation of the application area has been broadly mapped as Beard vegetation associations 9, 128, 522, 936 and 1413. These vegetation associations have not been extensively cleared at both a State and bioregional level (Government of Western Australia, 2018). While a number of clearing permits have been granted for the purpose of mineral exploration and production within the local area (20 kilometre radius), the local area has not been extensively cleared and the application area is not likely to be a significant remnant of native vegetation.

Given the above, the proposed clearing is not at variance with this Principle.

Table 1: Vegetation extents (Government of Western Australia, 2018)

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed lands (ha)	Current Extent remaining in all DBCA managed lands (proportion of Pre-European extent) (%)
IBRA bioregion					
Coolgardie	12,912,204.35	12,648,491.39	97.96	2,114,349.37	16.37
Beard vegetation association in WA					
9	240,509.33	235,161.94	97.78	18,984.28	7.89
128	329,836.19	288,813.54	87.56	69,081.92	20.94
522	709,714.81	709,228.05	99.93	39,342.70	5.54
936	698,752	676.689.18	96.84	28,010.13	4.01
1413	1,679,916.32	1,286,855.48	76.60	222,015.35	13.22
Beard vegetation association in IBRA bioregion					
9	240,441.99	235,100.97	97.78	18,984.28	7.90
128	184,549.90	183,891.19	99.64	34,672.13	18.79
522	688,406.97	687,920.22	99.93	39,342.70	5.72
936	586,792.23	584,336.14	99.58	18,103.64	3.09
1413	1,061,212.28	1,042,553.77	98.24	192,883.70	18.18
Local area					
	190,814.4	187,555.4	98.29	-	-

(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 at variance to this Principle

There are no permanent watercourses within the application area. There are five minor, non-perennial watercourses which intersect the application area. Vegetation associated with the minor, non-perennial watercourses is not confined to the application area and not growing exclusively in association with the watercourses (NVS, 2019).

Based on the presence of native vegetation within mapped watercourses within the application area, the proposed clearing is at variance with this Principle. However, given that the watercourses within the application area are minor and non-perennial, the proposed clearing of vegetation associated with watercourses is not likely to have a significant environmental impact.

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

Proposed clearing may be at variance with this Principle

The application area is mapped within the following soil systems:

- My154: Undulating country on acid volcanic rocks and sedimentary materials;
- BB5: Rocky ranges and hills of greenstones-basic igneous rocks;
- Mx42: Broad flat to undulating valleys with isolated granitic rock outcrops and some low escarpments; some seasonal lakes and claypans; and
- Mx43: Gently undulating valley plains and pediments; some outcrop of basic rock.

Land degradation risk has not been mapped over the application area, however, the surrounding area is associated with the Graves, Gumland and Moriarty land systems, which may be susceptible to wind and water erosion if vegetative cover is removed, especially within watercourses (Pringle et al., 1994).

Given the above, the proposed clearing may be at variance with this Principle. A condition requiring the cleared area to be used for the purpose of mineral production within three months of the clearing, will decrease the risk of land degradation via wind erosion.

(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 with this Principle

The application area is not located within any conservation areas. The closest conservation area, the Yallari Timber Reserve (the Reserve), occurs to the west of the application area, approximately 3.8 kilometres from the proposed mine disturbance footprint. The Reserve is located on the western side of the Coolgardie-Esperance Highway, while the access road to the Mt Marion lithium mine is on the eastern side. The Reserve has a gazetted reserve area of 6,075 hectares, and while it is in close proximity to the access road, the proposed clearing is not likely to further impact the environmental values of the Reserve beyond

those impacts attributed to the current disturbance from the Coolgardie-Esperance Highway. A weed management condition may assist in managing potential impacts to the environmental values to the Reserve.

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

As assessed within Principle (e), the local area retains approximately 98 per cent native vegetation. The application area is characterised by saline groundwater of between 14,000 to 35,000 milligrams/litre total dissolved solids. Given the extent of native vegetation within the local area and the hypersaline nature of groundwater in the area, the proposed clearing is not likely to deteriorate the quality of groundwater.

As assessed within Principle (f), no significant watercourses or wetlands are present within the application area. Given the minor and non-perennial nature of the watercourses within the application area, the proposed clearing is not likely to impact on the quality of surface water.

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

The nearest weather station to the application area is located at Coolgardie, approximately 25 kilometres from Karramindie. Climate statistics from the Bureau of Meteorology (BoM, 2019) show that the region receives an average annual rainfall of 270 millimetres, with rainfall spread throughout the year and each month receiving between 13 and 29 millimetres of rainfall. Given the low likelihood of extreme rainfall events and the presence of permeable sandy and loamy soils mapped within the application area (DPIRD, 2019), the proposed clearing is not likely to cause or increase the incidence or intensity of flooding.

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

Planning instruments and other relevant matters.

The Mt Marion lithium mine currently operates under clearing permit CPS 6770/2, which allows the clearing of 450 hectares for mineral production. The current clearing permit application (CPS 8632/1) includes 150 hectares previously approved under CPS 6770/2, with 450 hectares of proposed new clearing to support future development and mine expansion. Relevant approvals for the proposed activity have been obtained under the *Mining Act 1978, Environmental Protection Act 1986* and *Rights in Water and Irrigation Act 1914* (PMI, 2019).

There are no native title claims over the application area. The tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the Act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*. No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the DWER website on 27 August 2019 with a 21 day submission period. No public submissions have been received in relation to this application.

4. References

Bamford Consulting Ecologists (2019) Review of fauna assessments within the Mt Marion Lithium Application area. Unpublished report prepared by Bamford Consulting Ecologists for Mineral Resources Limited, 3 July 2019.

BoM (2019) Climate statistics for Australian locations, Coolgardie. Bureau of Meteorology.

Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.http://www.bom.gov.au/climate/averages/tables/cw_012018.shtml (Accessed December 2019).

Department of Primary Industries and Regional Development (DPIRD) (2019) NRMInfo (Natural Resource Management) Portal. Department of Agriculture and Food Western Australia. URL: http://maps.agric.wa.gov.au/nrminfo/. Accessed November 2019.

Government of Western Australia (2018) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth.

Grant, M., Comer, S., Gilfillan, S., Tiedemann, K. and Barrett, S. (2002) Coolgardie 1 (COO1 - Mardabilla subregion). In A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002 (eds J. E. May & N. L. McKenzie). Department of Conservation and Land Management, WA.

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

NVS (2019) Reconnaissance Flora and Vegetation survey for the Mt Marion Application area. Unpublished report prepared by Native Vegetation Solutions for Minerals Resources Ltd, June 2019.

PMI (2019) Clearing permit application and supporting documents for CPS 8632/1. DWER ref: A1810804.

Pringle, H.J.R., Van Vreeswyk, A.M.E., & Gilligan, S.A. (1994) An inventory and condition survey of rangelands in the northeastern Goldfields, Western Australia. Department of Agriculture, South Perth.

GIS databases:

- Aboriginal sites of significance
- Conservation areas
- Flora – WAHerb and TPFL
- Groundwater salinity
- Hydrography, linear
- Native titles - determination
- Pre-European Vegetation
- Remnant vegetation
- Threatened and Priority Ecological Communities