



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9518/1
Permit Holder:	Process Minerals International Ltd
Duration of Permit:	25 November 2022 to 25 November 2034

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 exploration.

2. Land on which clearing is to be done

Lot 105 on Deposited Plan 40396, Karramindie.

3. Area of clearing

The Permit Holder must not clear more than 200 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 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. Period in which clearing is authorised

The Permit Holder shall not clear any *native vegetation* after 25 November 2027.

6. 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.

PART II – MANAGEMENT CONDITIONS

7. Avoid, minimise and reduce the impacts and extent of clearing

The Permit Holder must apply the following principles in relation to clearing authorised under this Permit, 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* where it is reasonably practicable to do so.

8. Weed control

When undertaking any clearing 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 known *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. 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 yellow in Figure 1 of Schedule 1 to identify *Leipoa ocellata* (malleefowl) *active 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, delineated as either an *active mound* or inactive mound, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), 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 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees, to the *CEO*.
 - (iii) the methodology used to survey the area cross-hatched yellow on Figure 1 of Schedule 1 to establish the *Leipoa ocellata* (malleefowl) *critical habitat* and identify the mound/s;
 - (iv) the extent of the *critical habitat* of *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 9(a) of this Permit, the Permit Holder shall ensure that no clearing of *Leipoa ocellata* (malleefowl) *active mounds*, or *critical habitat* of the identified *Leipoa ocellata* (malleefowl) *active mounds* occurs, unless first approved by the *CEO*.

10. Threatened and priority flora management

- (a) Prior to undertaking any clearing authorised under this Permit, the Permit Holder shall engage a *botanist* to conduct a *targeted flora survey* of the area cross hatched yellow in Figure 1 of Schedule 1 for the presence of *priority flora* listed under the *Biodiversity Conservation Act 2016*.
- (b) Where *priority 1* flora are identified under condition 10(a) of this Permit, the Permit Holder shall not cause or allow:
 - (i) clearing of the identified *priority 1* flora; and
 - (ii) clearing within 20 metres of the identified *priority 1* flora
- (c) Where *priority 2, 3* and *4* flora are identified under condition 10(a) of this Permit, the Permit Holder shall not cause or allow:
 - (i) clearing of the identified *priority 2, 3* or *4* flora, unless approved by the *CEO*; and
 - (ii) clearing within 10 metres of the identified *priority 2, 3* and *4*, unless approved by the *CEO*.
- (d) Within two months of undertaking any clearing authorised under this Permit within the area cross hatched yellow in Figure 1 of Schedule 1, the Permit Holder shall provide the results of the *targeted flora survey* in a report to the *CEO*.
- (e) If *priority flora* are identified within the area cross hatched yellow in Figure 1 of Schedule 1, the *targeted flora survey* report must include the following:
 - (i) the location of each *priority flora*, identified under condition 10(a) of this Permit, either as the location of individual plants, or where this is not practical, the areal extent of the population and an estimate of the number of plants, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the species name of each *priority flora* species identified under condition 10(a) of this Permit; and
 - (iii) the methodology used to survey the area cross hatched yellow in Figure 1 of Schedule 1.

11. Directional clearing

The Permit Holder must conduct clearing authorised under this Permit in a slow, progressive manner to allow a reasonable time for fauna present within the area cross hatched yellow in Figure 1 of Schedule 1, to move into adjacent *native vegetation* ahead of the clearing activity.

12. Revegetation and rehabilitation

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, and no later than 25 May 2028, *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 12(a) on the cleared area; and
 - (iii) ripping the ground on the contour to remove soil compaction;
 - (iv) 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

- (v) ensuring only *local provenance* seeds and propagating material are used to *revegetate* and *rehabilitate* the area.
- (c) Within 36 months of undertaking *revegetation* and *rehabilitation* in accordance with Condition 12(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 12(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.
- (d) where additional *planting* or *direct seeding* of native vegetation is undertaken in accordance with condition 12(c)(ii) of this Permit, the Permit Holder shall repeat condition 12(c)(i) and 12(c)(ii) within 36 months of undertaking the additional *planting* or *direct seeding* of native vegetation.
- (e) where a determination by an *environmental specialist* that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in condition 12(c)(i) and (ii) of this Permit, that determination shall be submitted for the *CEO*'s consideration. If the *CEO* does not agree with the determination made under condition 12(c)(ii), the *CEO* may require the Permit Holder to undertake additional *planting* and *direct seeding* in accordance with the requirements under condition 12(c)(ii).

13. Vegetation community management

The Permit Holder must not clear any of the granite outcrop vegetation community, recorded as Vegetation Type 04 (VT04), as identified in the 'GHD (2018) Westgold. Location 53 West. Flora and Fauna Assessment'.

14. Fauna management – retain habitat trees

- (a) Prior to undertaking any clearing authorised under this Permit, the Permit Holder must identify and record any *habitat trees* containing hollows in the intended clearing area, within the larger approved clearing area shown on Figure 1 of Schedule 1.
- (b) The applicant must retain all *habitat trees* containing hollows as identified under condition 14(a).
- (c) On the completion of clearing authorised under this Permit, the Permit Holder must record the locations of the *habitat trees* retained under condition 14(b).

15. Watercourse management

- (a) The Permit Holder shall not clear native vegetation within 50 metres of any *watercourse* or *drainage line*, except for the purpose of a crossing, unless first approved by the *CEO*.
- (b) Where a *watercourse* or *drainage line* is to be impacted by clearing for a crossing, the Permit Holder shall ensure that surface flow is maintained, or is reinstated downstream into existing natural drainage lines.

PART IV - RECORD KEEPING AND REPORTING

16. Records that must be kept

The Permit Holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken in accordance with condition 6; (f) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 7; (g) actions taken to minimise the risk of the introduction and spread of weeds in accordance with condition 8; (h) flora management actions taken in accordance with condition 10; (i) actions taken in accordance with condition 11; (j) vegetation community management actions taken in accordance with condition 13; and (k) watercourse management actions taken in accordance with condition 15.
2.	In relation to the fauna survey undertaken for malleefowl management pursuant to condition 9 of this Permit	<ul style="list-style-type: none"> (a) the location of each <i>Leipoa ocellata</i> (malleefowl) mound, delineated as either an <i>active mound</i> or inactive mound, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees, to the <i>CEO</i>; (b) the location of the <i>Leipoa ocellata</i> (malleefowl) critical habitat, recorded using a GPS unit set to GDA94/2020,

No.	Relevant matter	Specifications
		<p>expressing geographical coordinates in Eastings and Northings or decimal degrees, to the <i>CEO</i>;</p> <p>(c) the methodology used to survey the Permit Area and to establish the <i>Leipoa ocellata</i> (malleefowl) critical habitat and identify the mound/s;</p> <p>(d) the extent of the critical habitat of the <i>Leipoa ocellata</i> (malleefowl) shown on a map; and</p> <p>(e) a description of the <i>critical habitat</i> found.</p>
3.	In relation to the <i>revegetation</i> and <i>rehabilitation</i> of areas pursuant to condition 12 of this Permit	<p>(a) the location of any areas revegetated and rehabilitated, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;</p> <p>(b) a description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken; and</p> <p>(c) the size of the area revegetated and rehabilitated (in hectares).</p>
4.	In relation to retention of hollow bearing <i>habitat trees</i> pursuant to condition 14 of this Permit	<p>(a) the location of all hollow bearing <i>habitat trees</i> retained, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994/2020 (GDA94/2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees.</p>

17. Reporting

- (a) The Permit Holder must provide to the *CEO*, on or before 30 June of each calendar year, a written report containing:
 - (i) the records required to be kept under condition 16; and
 - (ii) records of activities done by the Permit Holder under this Permit between 1 January and 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit has been undertaken, a written report confirming that no clearing under this Permit has been undertaken, must be provided to the *CEO* on or before 30 June of each calendar year.
- (c) The Permit Holder must provide to the *CEO*, no later than 90 calendar days prior to the expiry date of the Permit, a written report of records required under condition 16, where these records have not already been provided under condition 17(a).

DEFINITIONS

In this Permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
active mound/s	means mounds which appear to exhibit characteristics associated with normal nesting activity. This may include a nest mounded up, litter trails leading to mound, extensive soil and litter disturbance, and/or birds seen actively digging.
botanist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of two (2) years' work experience in Western Australian flora identification and undertaking surveys of flora native to the bioregion being inspected or surveyed, or who is approved by the CEO as a suitable botanist for the bioregion, and who holds a valid flora licence issued under the <i>Biodiversity Conservation Act 2016</i> .
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this Clearing Permit is subject under section 51H of the EP Act.
critical habitat	means any part of the Permit area comprising of habitat for <i>Leipoa ocellata</i> (malleefowl) and its population, that is critical for the health and long term survival of <i>Leipoa ocellata</i> (malleefowl) and its population;
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
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.
drainage line	means a natural depression that carries surface water runoff.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
fauna specialist	means a person who holds a tertiary qualification specialising 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 <i>Biodiversity Conservation Act 2016</i> .
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 and where conservation significant fauna are identified in the Permit area, also includes a fauna survey of surrounding areas to place the Permit area into local context.
fill	means material used to increase the ground level, or to fill a depression.
habitat trees	means trees with a diameter at breast height of 300 millimetres or greater
local provenance	means native vegetation seeds and propagating material from natural sources within 50 km and the same 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.

Term	Definition
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
priority flora	means those plant taxa described as priority flora classes 1, 2, 3, or 4 in the <i>Department of Biodiversity, Conservation and Attractions Threatened and Priority Flora List for Western Australia</i> (as amended).
regenerate/ed/ion	means revegetation that can be established from in situ seed banks contained either within the topsoil or seed-bearing mulch.
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 <i>local provenance</i> native vegetation in an area using methods such as natural <i>regeneration</i> , <i>direct seeding</i> and/or <i>planting</i> , so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
targeted flora survey	means a field-based investigation, including a review of established literature, of the biodiversity of flora and vegetation of the Permit area, focusing on habitat suitable for flora species that are being targeted and carried out during the optimal time to identify those species. Where target flora are identified in the Permit area, the survey must also include a minimum of a 10 metre radius of the surrounding areas to place the Permit area into local context.
threatened flora	means those plant taxa listed as threatened flora under the <i>Biodiversity Conservation Act 2016</i> .
watercourse	has the meaning given to it in section 3 of the <i>Rights in Water and Irrigation Act 1914</i> ;
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; 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.
wetland	means an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary.

END OF CONDITIONS



Meenu Vitarana
 MANAGER
 NATIVE VEGETATION REGULATION

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

2 November 2022

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

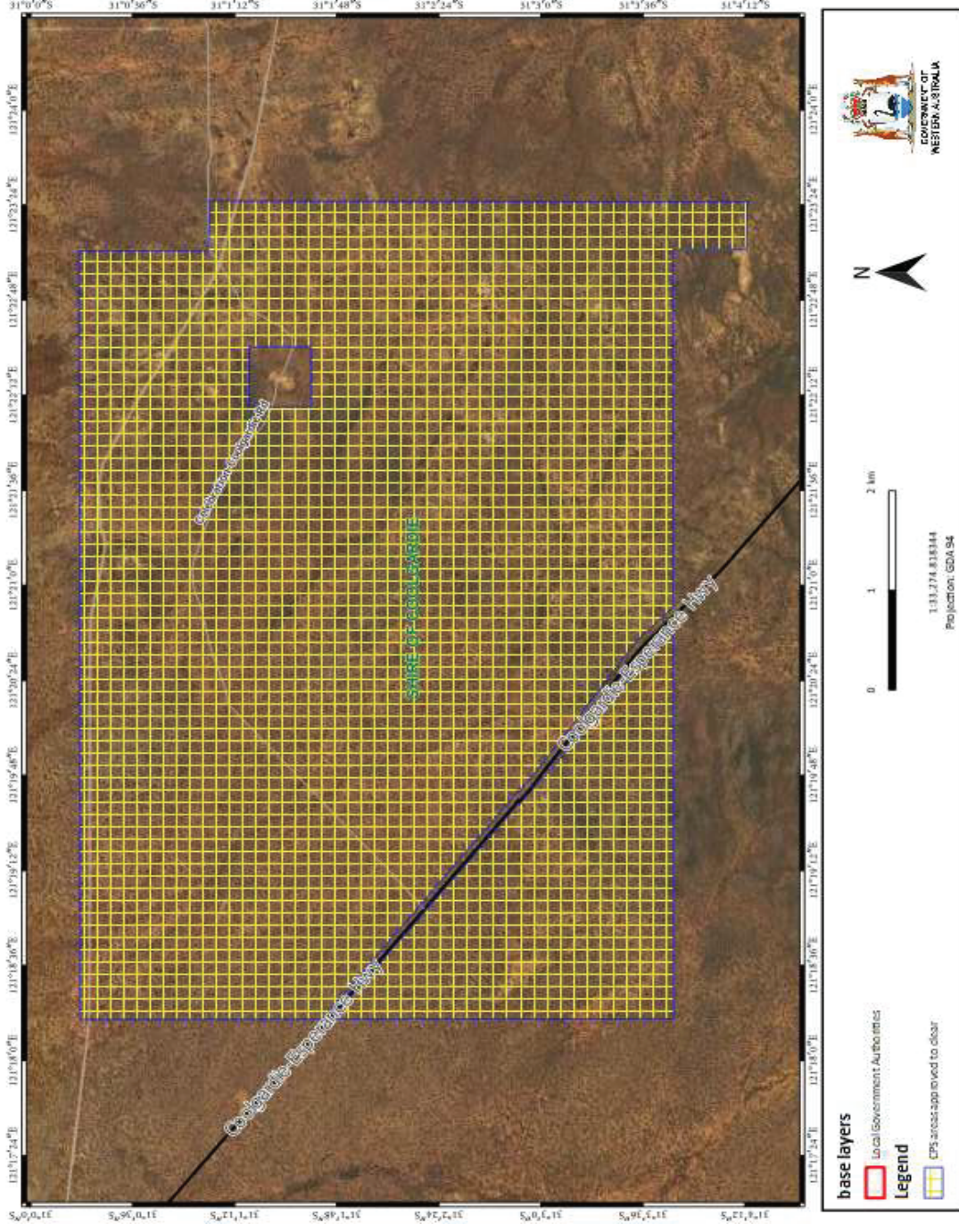


Figure 1: Map of the boundary of the area within which clearing may occur



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9518/1
Permit type:	Purpose permit
Applicant name:	Process Minerals International Ltd
Application received:	10 December 2021
Application area:	200 hectares of native vegetation
Purpose of clearing:	Exploration works
Method of clearing:	Mechanical
Property:	Lot 105 on Plan 40396
Location (LGA area/s):	Coolgardie
Localities (suburb/s):	Karramindie

1.2. Description of clearing activities

The application is to selectively clear up to 200 hectares of native vegetation within a much larger footprint area comprising 5,215.3 hectares. The entirety of Lot 105 is vegetated, and forms a largely contiguous area of native vegetation. The application area borders Karramindie State Forrest on the northeast corner of the Lot and Yallari Timber Reserve to the south. The local area (20 km radius surrounding the application area) retains around 94 per cent native vegetation cover.

The proposed clearing is for exploration works, initially to investigate potential lithium mining. The applicant has advised that it is committed to limit clearing to existing pads, tracks and sumps and will exclude any requirement for the clearing of extensive contiguous areas (Mineral Resources Limited, 2021). The exploration works are expected to be temporary and progressive rehabilitation of affected areas is proposed by the applicant (Mineral Resources Limited, 2021).

1.3. Decision on application

Decision:	Granted
Decision date:	2 November 2022
Decision area:	200 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 public submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix H.1), the findings of a flora and fauna assessment (GHD, 2018), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments, and any other matters considered relevant to the assessment (see Section 3).

In particular, the Delegated Officer has considered the following:

- the application area provides suitable habitat for malleefowl (*Leipoa ocellata*) (VU), and the proposed clearing may result in direct impacts to this species should it occur onsite during clearing
- the application area contains several trees containing hollows which provide suitable habitat for other non-conservation significant fauna species
- the application area provides potentially suitable habitat for 11 priority flora species, and the proposed clearing may result in direct impacts to these species should they occur within the application area
- the soils in the application area are prone to wind erosion and the proposed clearing may exacerbate this risk
- the proposed clearing will increase the risk of sedimentation of a minor non-perennial watercourse which intersects the application area
- the proposed clearing may introduce and spread weeds into adjacent conservation areas
- the proposed clearing may impact on 5.02 hectares of a regionally and locally restricted granite outcrop vegetation community, recorded as Vegetation Type VT04 within the flora survey of the application area

The Delegated Officer also took into consideration that the proposed clearing is largely for temporary works relating to geotechnical investigations, and that the applicant has committed to revegetating temporarily cleared areas post clearing.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that the following requirements will be conditioned on the clearing permit to manage and address the impacts of clearing:

- avoid and minimise measures to reduce the impacts and extent of clearing
- mining exploration activities must occur within three months of clearing to reduce the exposure time of bare sandy soils and minimise the risk of wind erosion
- take hygiene steps to minimise the risk of the introduction and spread of weeds into adjacent conservation areas
- avoid the clearing of any hollow bearing trees with a diameter at breast height of greater than 300 millimetres
- avoid clearing within 50 metres of the non-perennial watercourse intersecting the application area, unless for the purpose of a crossing
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- engage a fauna specialist prior to clearing to identify malleefowl (*Leipoa ocellata*) nesting mounds. The applicant must avoid active nesting mounds and surrounding mound habitat that is critical for the health and long-term survival of malleefowl
- engage a botanist to undertake a flora survey of the application area for the presence of priority flora. If found the applicant must avoid priority flora species and provide a 20 metre buffer around priority 1 species, and a 10 metre buffer around all other priority species, unless otherwise approved by the CEO
- avoid the granite outcrop vegetation community, recorded as Vegetation Type VT04 within the flora survey of the application area
- undertake revegetation of temporary cleared areas, to achieve the same species composition, structure and density of those areas pre-clearing.

Noting that the above conditions will manage and address the environmental impacts of clearing, the Delegated Officer determined that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

1.5. Site map

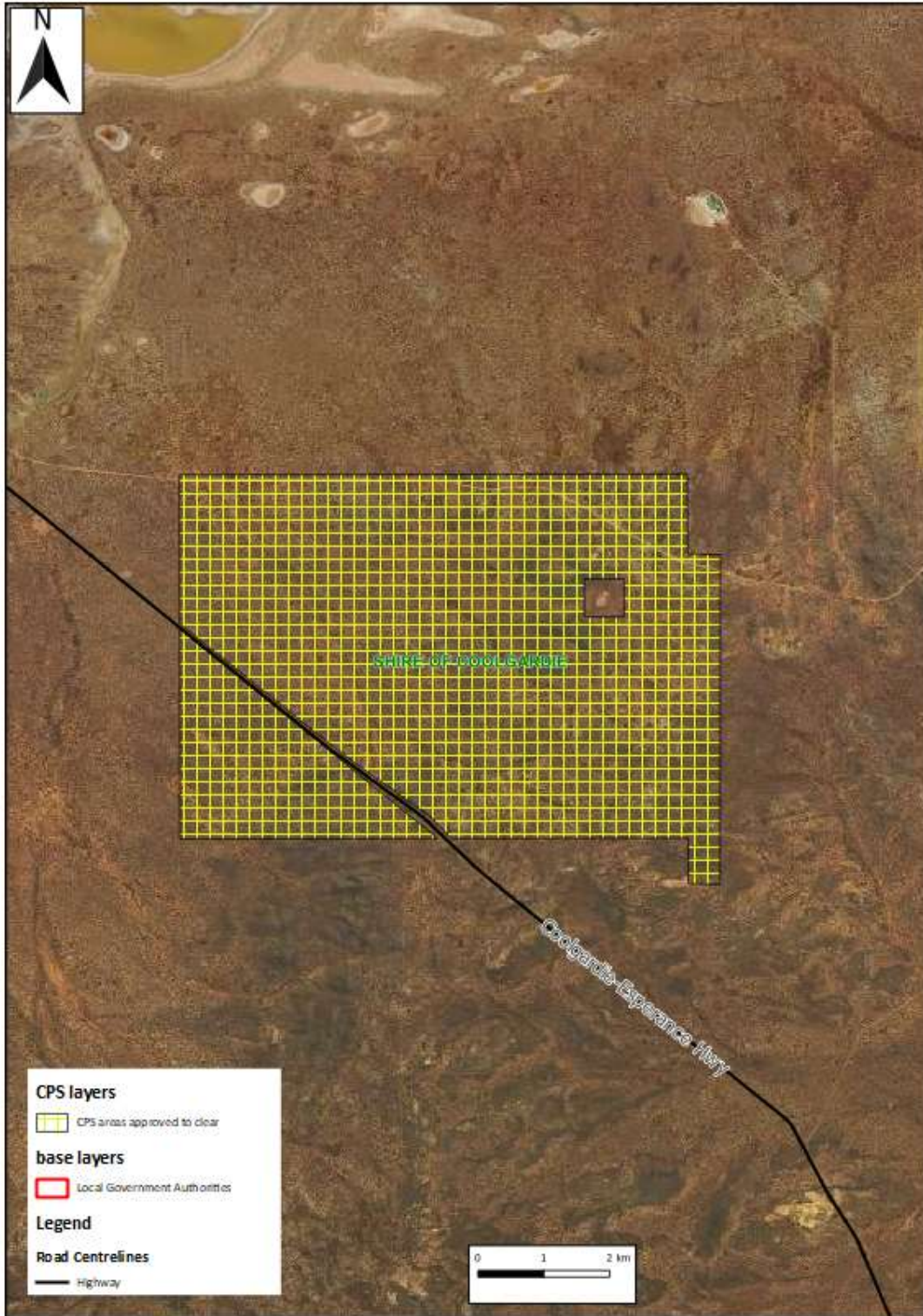


Figure 1. Map of the application area

The applicant is authorised to clear up to 200 hectares with the area cross-hatched yellow shown above.

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 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)

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)
- 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 applicant has advised that it is committed to limit clearing to existing pads, tracks and sumps and will exclude any requirement for the clearing of extensive contiguous areas (Mineral Resources Limited, 2021). The applicant notes that the exploration works are expected to be temporary, and progressive rehabilitation will be undertaken within six months of clearing to ensure minimal long-term impacts (Mineral Resources Limited, 2021).

The applicant has advised that it has environmental management procedures in place which the proposed exploration activities will adhere to, this includes the following (Mineral Resources Limited, 2021):

- Fauna Management Procedure
 - employees and contractors are required to undertake a site induction to provide information about legal obligations to protect native fauna and inform of locally occurring conservation significant species
 - native fauna will not be captured or intentionally handled except by appropriately qualified personnel
 - exploration drill holes must be capped immediately with a concrete conical plug once drilling has ceased, to avoid native fauna falling into or becoming trapped in drill holes
 - the application area will be pre-surveyed for malleefowl mounds, and a minimum 50 metre buffer will be retained around each mound.
- Land Clearing Procedure
 - a pre-start check must be conducted prior to commencement of any clearing to ensure operators are familiar with the conditional requirements, clearing boundaries, depth of soil stripping, strategy for stockpiling of topsoil, and any special areas to be protected
 - to prevent the spread of environmental weeds, all vehicles, plant and equipment must comply with the Weed Hygiene and Control procedure
 - all vehicles, plant and equipment shall be restricted to within the approved clearing area
 - observers and spotters will be used when working near sensitive sites
 - recovered topsoil must be stockpiled to maximum height of two metres to preserve the soil physical/chemical properties and seed bank. Subsoil, can be stockpiled to a height of four metres. Stockpiles will not interfere with any surface drainage flows
 - woody debris should be stockpiled adjacent to topsoil. Larger objects such as tree trunks may need to be separately stockpiled to enable woody debris to be more readily handled.
- Site Disturbance Procedure
- Weed Hygiene and Control Procedure
 - all employees and contractors are required to participate in the site induction, which will provide an awareness of weeds, including risk species, and an overview of the weed hygiene process
 - training in weed hygiene requirements for personnel responsible for the transfer of earthmoving equipment and vehicles between sites will occur
 - vehicles or earthmoving equipment leaving a mine will be cleaned down so that it is free of vegetation and soil, and, following an inspection, a Weed Hygiene Certificate (WHC) will be issued

- specialist training (chemical handling, personal protection etc.) may be required if site personnel are involved in chemical methods of weed control
- declared or pest plants occur on site, control should be undertaken when it is practical to do so in consultation with the Department of Primary Industries and Regional Development (DPIRD)
- weed control methods may include spraying with herbicide or physical removal
- Land Rehabilitation Procedure
 - the mine rehabilitation works will be progressively implemented
 - works will be conducted to a good standard that minimises the requirement for re-work
 - rehabilitation plan consistent with best practice guidelines will be developed
 - appropriate seed and tubestock will be identified and sourced
 - topsoil and subsoil resources will be utilised efficiently, and promote vegetation growth and reduce contamination, destruction, resource loss or weed presence
 - rehabilitation will be monitored (and associated analogue sites) and assessed against agreed criteria
 - remedial work on unsuccessful rehabilitation (earthworks, re-seeding, weed control, feral animal control, fencing) will occur as necessary.

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

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) 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 **Error! Reference source not found.**) identified that the impacts of the proposed clearing may present a risk to flora and fauna. 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 value – Fauna – Clearing Principle (b)

Assessment:

The application area was subject to a single season Level 1 (reconnaissance) fauna survey on 21 to 23 March 2018 (the Fauna Survey). The Fauna Survey was undertaken to (GHD, 2018):

- verify the accuracy of the desktop study
- identify fauna habitat types
- identify and record fauna taxa present at the time of survey and assess habitat value and connectivity
- undertake an assessment of the likelihood of occurrence of conservation significant fauna and their habitats post the field survey.

The Fauna Survey identified five broad habitat types within the application area (larger footprint area of 5215.3 hectares) (GHD, 2018):

Fauna habitat type	Extent within the larger application area footprint (5215.3 ha)
Rocky <i>Acacia</i> shrubland	5.02
<i>Melaleuca</i> shrubland	517.14
Mixed <i>Eucalyptus</i> woodland over spinifex	450.49
Mixed <i>Eucalyptus</i> woodland over mixed shrubs	4174.48
Cleared areas	67.19

The Fauna Survey initially identified 12 conservation significant fauna species that may occur within the application area (pre-survey), with most of these species previously recorded in the local area. Of these, one species, malleefowl (*Leipoa ocellata*), was recorded within the application area during the Fauna Survey.

The Fauna Survey also identified the rainbow bee-eater (*Merops ornatus*), which was formally state and federally listed as a conservation significant, however is no longer listed as conservation significant at a state or federal level.

No other conservation significant species were considered likely to occur within the application area post survey (GHD, 2018). This is based on the habitat types recorded, relative to the known habitat requirements of the other 11 conservation significant fauna species initially considered as potentially occurring (GHD, 2018).

The malleefowl is state listed as vulnerable under the *Biodiversity Conservation Act 2016*. This species is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias (Benshemesh, 2007). Malleefowl require a sandy substrate and abundance of leaf litter for breeding, where it constructs nesting mounds from leaf litter (Benshemesh, 2007).

A malleefowl individual was sighted and three mounds were identified during the Fauna Survey (GHD, 2018). The malleefowl was identified within the following three fauna habitat types (GHD, 2018):

- Rocky *Acacia* shrubland – identified foraging amongst the thick *Acacia*
- *Melaleuca* shrubland - identified as occupying and breeding in this habitat type by the presence of two mounds, one of which showed recent signs of use
- Mixed *Eucalyptus* woodland over mixed shrubs - identified as occupying and breeding in this habitat type by the presence of an old mound.

The mixed *Eucalyptus* woodland over spinifex also provides suitable habitat for malleefowl, although malleefowl activity was not recorded in this habitat type (GHD, 2018).

The fauna habitats suitable for malleefowl cover 5417.13 hectares of the larger application area footprint, of which up to 200 hectares is proposed for clearing (3.69 per cent). The local area retains around 94 per cent remnant native vegetation, and includes several large Department of Biodiversity, Conservation and Attractions (DBCA) managed lands within, or just outside of the local area. Most of these areas, as listed below, include malleefowl records, indicating the presence of suitable habitat:

- Karramindie State Forrest
- Yallari Timber Reserve
- Kambalda Nature Reserve
- Lakeside Timber Reserve
- Scahill Timber Reserve
- Kangaroo Hills Timber Reserve
- Goldfields Woodlands Conservation Park
- Goldfields Woodlands National Park

While extensive surrounding habitat exists for malleefowl, the loss of any active nesting mounds is considered a significant impact to this species. Therefore, the applicant will be required to avoid active malleefowl nesting mounds and immediately surrounding critical habitat of active mounds when undertaking clearing.

Given the extent of potentially suitable habitat for malleefowl in the local area and within surrounding DBCA estate, the proposed clearing of native vegetation not currently being used by malleefowl for breeding is unlikely to impact on significant habitat for this species.

While no additional conservation significant fauna species are considered likely to occur within the application area, the Fauna Survey identified 33 trees with hollows which provide suitable habitat for a range of other fauna species (GHD, 2018). The Fauna Survey estimates that the frequency of habitat trees across the application area is around five trees per hectare (GHD, 2018). These trees are largely *Eucalyptus salmonophloia* and *Eucalyptus loxophleba* which typically develop hollows after they reach a diameter at breast height of 300 millimetres or greater. The applicant has advised that impacts to these trees will be avoided (Mineral Resources, 2021).

As noted above, the application area also provides suitable habitat for the rainbow bee-eater. The applicant has committed to maintaining a 50-metre buffer around any rainbow bee-eater burrows identified (Mineral Resources, 2021).

The application area retains fauna habitat linkages to the surrounding area in all directions. Specifically, the habitat within the application area is directly connected to Karamindie State Forest to the north-east (780 hectares) and Yallari Timber Reserve to the south (6100 hectares). The proposed clearing of up to 3.69 per cent of the application area will not sever the linkage, and the applicant has committed to rehabilitating temporary cleared areas post undertaking geotechnical investigations, which will help to reinstate linkage values.

Conclusion

Based on the above assessment, and with consideration of the applicants measures to avoid and minimise impacts, the proposed clearing will result in the loss of:

- up to 200 hectares of suitable malleefowl habitat, including habitat currently being used for breeding
- native vegetation that contributes to fauna linkage values between DBCA managed lands
- trees with hollows that provide fauna habitat

While it is noted that malleefowl individuals utilising the application area are unlikely to exclusively rely on the area for all habitat resource requirements, the potential loss of any active nesting mounds is considered a significant impact to this species.

Outcome

The Delegated Officer determined that the proposed clearing requires management conditions in relation to this environmental value. Therefore, the following management measures will be required as conditions on the clearing permit:

- avoid and minimise measures to reduce the impacts and extent of clearing
- avoid the clearing of any trees containing hollow/s with a diameter at breast height of greater than 300 millimetres
- slow directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity
- undertake a pre-clearance malleefowl survey of the application area to identify malleefowl nesting mounds, and avoid identified active nesting mounds and associated surrounding critical habitat (being habitat that is critical for the health and long-term survival of malleefowl)
- rehabilitate temporary cleared areas to their pre-cleared state, to reinstate the previous vegetation composition, structure and density present, to limit long term impacts to fauna linkage values.

3.2.2. Biological value – Flora and ecological communities – Clearing Principle (a)

GHD (2018) conducted an enhanced reconnaissance survey of the application area from 21–23 March 2018 (the Flora Survey). GHD (2018) note that the Flora Survey methodology was undertaken with reference to the Environmental Protection Authority (EPA) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a).

The survey was undertaken to (GHD, 2018):

- verify the results of the desktop assessment
- determine the current composition and condition of vegetation present within the application area,
- identify and record vascular flora taxa present at the time of survey.
- assess the potential for conservation flora to occur

Threatened and Priority Flora

Desktop searches identified the presence/potential presence of 24 conservation significant flora species in the application area. This likelihood of occurrence analysis was based on known records within the local area and mapped habitat types relative to the known habitat of these flora species (GHD, 2018).

No state or federally listed threatened, or priority flora species were recorded within the application area during the Flora Survey (GHD, 2018).

GHD (2018) undertook a likelihood of occurrence assessment post-field survey for all conservation significant flora taxa identified in the desktop assessment. This assessment considered previous records, habitat requirements, efficacy of the survey, intensity of the survey, flowering times and the cryptic nature of species (GHD, 2018).

The likelihood of occurrence assessment concluded that two priority flora species are likely to occur, eight may occur (as listed below) and the remaining 14 taxa are unlikely to occur within the application area (GHD, 2018). Additionally, DWER considers that an additional priority flora species, *Pterostylis xerampelina* (P1), may also occur within the application area noting it occurs within the local area and little is known about its required habitat.

The priority flora species considered likely to occur within the application area are:

- *Acacia websteri* (P1) – known from 20 records over a range of 455 kilometres
- *Thryptomene* sp. Londonderry (R.H. Kuchel 1763) (P1) – known from 22 records over a range of 62 kilometres

Since the Flora Survey was undertaken, the name *Thryptomene* sp. Londonderry (R.H. Kuchel 1763) is no longer current and this species is now considered to be *Thryptomene planiflora*, which maintains the same P1 conservation status (Western Australian Herbarium, 1998-). Suitable habitat for these species occurs within Vegetation Type VT02, described as *Eucalyptus* spp. isolated trees over tall shrubland (GHD, 2018). The application area includes 517.14 hectares of VT02 (GHD, 2018).

The priority flora species considered as possibly occurring are (GHD, 2018):

- *Acacia coatesii* (P1) – known from five records
- *Dampiera plumosa* (P1) – known from seven records
- *Pterostylis xerampelina* (P1) – known from 14 records
- *Thryptomene* sp. Coolgardie (E. Kelso s.n. 1902) (P1) – known from two records
- *Eremophila praecox* (P2) – known from 36 records over a restricted range of 61 kilometres
- *Austrostipa* sp. Dowerin (G. Wiehl F 8004) (P2) – known from nine records
- *Diocirea acutifolia* (P3) – known from 20 records over a range of 132 kilometres (the application area would represent the northern most extent should this species occur on site)
- *Alyogyne* sp. Great Victoria Desert (P3) – known from 17 records over a range of 740 kilometres
- *Eremophila caerulea* subsp. *Merrallii* (P4) - known from 23 records, over a 194 kilometre range (application area is on the eastern extent of this species current known range)

Since the Flora Survey was undertaken, the names *Austrostipa* sp. Dowerin (G. Wiehl F 8004) and *Diocirea acutifolia* are no longer current, and these species are now known as *Austrostipa frankliniae* and *Eremophila acutifolia*, respectively. Both species maintain the same conservation status (P2 and P3 respectively) as they formerly did (Western Australian Herbarium, 1998-).

While the above priority flora species were not identified during the Flora Survey (GHD, 2018), DWER notes that the Flora Survey was an enhanced reconnaissance survey and did not include comprehensive survey methods for targeting the above species across the entirety of the application area. Therefore, there is the potential for these species to occur within the application area.

Of the 11 priority flora species listed above, 8 species are known from 20 or less records, and the other three have a restricted range and/or the application area occurs on the extent of these species known range. Therefore, the proposed clearing has the potential to significantly impact on all species local or regional level, should they occur within the application area.

Threatened and Priority Ecological Communities

There are no threatened or priority ecological communities recorded in the application area, and the vegetation types identified are not considered to be representative of any known threatened or priority ecological communities.

However, the Flora Survey noted that the granite outcrop community recorded over 5.02 hectares of the application area, which is described as the vegetation type "mixed open shrubland over herbland" (VT04), includes other significant vegetation due to its restricted habitat (granite outcrops) (GHD, 2018). The Flora Survey notes that this community supports local endemism and has a restricted distribution in the local and regional area (GHD, 2018).

Conclusion

Based on the above assessment, and with consideration of the applicants measures to avoid and minimise impacts, the proposed clearing:

- may significantly impact on the local and/or regional extent of 11 priority flora species, should they occur within the application area
- may result in the loss of 5.02 hectares of a granite outcrop vegetation community (VT04), which supports local endemism and has a restricted distribution in the local and regional area.

Outcome

The Delegated Officer determined that the proposed clearing requires management conditions in relation to this environmental value. Therefore, the following management measures will be required as conditions on the clearing permit:

- avoid and minimise measures to reduce the impacts and extent of clearing
- engage a botanist to undertake a flora survey of the application area for the presence of priority flora. If found the applicant must avoid priority flora, and maintain a 20 metre buffer around P1 flora, and a 10 metre buffer around all other priority flora unless otherwise approved by the CEO
- the applicant must avoid the granite outcrop vegetation community, being vegetation type VT04, as recorded during the Flora Survey (GHD, 2018)

3.3. Relevant planning instruments and other matters

The application area is zoned rural under the town planning scheme.

Mineral Resources Limited operates the Mount (Mt) Marion Lithium Mine approximately 36 kilometres south of Kalgoorlie in the Eastern Goldfields region. The applicant proposes to explore for lithium in areas around the mine (Mineral Resources Limited, 2021). The application area is freehold land on Lot 105, within West Hamptons Area 53. Freehold land grants the landowner the right to retain the mineral rights, and therefore the provisions under the *Mining Act 1978* (Mining Act) do not apply. Mining Act exempt locations such as this are governed under the *Mining on Private Property Act 1898*.

The application area occurs over an area previously granted to clear by DWER, being clearing permit CPS 8235/1. The permit was granted for the purpose of mineral exploration to Northern Star and expires in September 2024. Both areas of proposed exploration occur within considerably larger footprints, and it is not expected that the overlapping approved clearing areas will result in any complications to compliance with the conditions on either clearing permit.

The applicant has advised that it will not require the taking of surface or groundwater for the proposed exploration works, and that licences under the *Rights in Water and Irrigation Act 1914* are not required.

Two 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.

End

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	<p>The application area is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia, within the Coolgardie Bioregion. It is surrounded by extensive areas of remnant native vegetation including the adjacent Karamindie State Forrest and Yallari Timber Reserve.</p> <p>Spatial data indicates the local area (20-kilometre radius from the centre of the application area) retains around 94 per cent of its original native vegetation cover.</p>
Ecological linkage	<p>According to available datasets, the application area is not within any formal ecological linkages. However, the application area provides linkage values between Karamindie State Forest and the Yallari Timber Reserve.</p>
Conservation areas	<p>The application area borders Karamindie State Forest to the north-east and Yallari Timber Reserve to the south.</p>
Vegetation description	<p>The Flora Survey identified the following vegetation types within the application area (GHD, 2018):</p> <ul style="list-style-type: none"> • VT01 - <i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i> and <i>E. griffithsii</i> open woodland over <i>Eremophila</i> spp., and <i>Acacia</i> spp. mid shrubland – comprises 215.97ha of the larger application area footprint • VT02 - <i>Eucalyptus</i> spp. isolated trees over <i>Melaleuca uncinata</i>, <i>Acacia acuminata</i> tall shrubland over <i>Prostanthera grylloana</i> low open shrubland - comprises 517.14ha of the larger application area footprint • VT03 - <i>Eucalyptus</i> spp. woodland over <i>Acacia</i> spp., <i>Eremophila</i> spp. Tall open shrubland over <i>Triodia</i> sp. Open hummock grassland - comprises 450.49ha of the larger application area footprint • VT04 - <i>Acacia acuminata</i>, <i>Melaleuca eleuterostachya</i>, <i>Eremophila serrulata</i> mid open shrubland over <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>, Asteraceae sp. open herbland - comprises 5.02ha of the larger application area footprint • VT05 - <i>Eucalyptus</i> spp. open woodland over <i>Melaleuca sheathiana</i>, <i>M. lanceolata</i>, <i>Allocasuarina acutivalvis</i> subsp. <i>acutivalvis</i> tall sparse shrubland over <i>Senna artemisioides</i>, <i>Halgania andromedifolia</i> low open shrubland - comprises 860.96ha of the larger application area footprint • VT06 - <i>Eucalyptus</i> spp. woodland over <i>Acacia hemiteles</i>, <i>Eremophila</i> spp. tall shrubland over chenopod low open shrubland - comprises 1,944.54ha of the larger application area footprint • VT07 - <i>Eucalyptus</i> spp. open woodland over <i>Senna artemisioides</i>, <i>Eremophila scoparia</i>, <i>Atriplex vesicaria</i> mid shrubland - comprises 1,153.09ha of the larger application area footprint • Cleared areas - comprises 67.19ha of the larger application area footprint <p>According to broad scale vegetation association mapping, the application area comprises (Shepherd et al., 2001):</p> <ul style="list-style-type: none"> • Beard vegetation association 9, described as medium woodland; coral gum (<i>Eucalyptus torquata</i>) & goldfields blackbutt (<i>E. le soufii</i>) • Beard vegetation association 468, described as medium woodland; salmon gum & goldfields blackbutt • Beard vegetation association 936, described as medium woodland; salmon gum • Beard vegetation association 1413, described as shrublands; acacia, casuarina & melaleuca thicket. <p>The mapped vegetation types all retain greater than 95 per cent of their original extent (Government of Western Australia, 2019).</p>

Characteristic	Details
Vegetation condition	<p>The Flora Survey identified the following vegetation condition within the application area (according to the Trudgen (1991) condition rating scale which is appropriate for the Eremaean Botanical Province) (GHD, 2018):</p> <ul style="list-style-type: none"> • Excellent - 5,136.27 ha of the larger application area footprint • Good - 10.86 ha of the larger application area footprint • Cleared areas – 67.19 ha <p>The Flora Survey noted that most of the application area was in excellent (Trudgen, 1991) condition with very little weed invasion (GHD, 2018). The area rated as good (Trudgen, 1991) condition was due to weed invasion and litter, associated with the Coolgardie-Esperance Highway. Areas marked out as pipeline, roads and tracks were not give a condition rating (GHD, 2018).</p> <p>The full Trudgen (1991) condition rating scale is provided in Appendix E.</p>
Climate and landform	<p>The climate of the area is mostly hot and dry, with an average annual rainfall of 265 mm which evenly distributed throughout the year.</p> <p>The application area is in the Southern Cross Zone of the Kalgoorlie Province. The Southern Cross Zone is described as rises and low hills on Archaean greenstones, with broad valleys often containing salt lake chains (Schoknecht <i>et al.</i> 2004).</p> <p>The application area is characterised by flat to gently undulating plains with silty clay soils and occasional rocky rises (GHD, 2018).</p>
Soil description	<p>Soil landscape mapping (GoWA 2018a) indicates that three soil landscape types occur within the application area:</p> <ul style="list-style-type: none"> • Mx43 - Gently undulating valley plains and pediments; some basic rock outcrop • My154 - Undulating country on acid volcanic rocks and sedimentary materials • Mx41 - Flat to undulating pediments; granitic rock outcrop; low escarpments
Land degradation risk	<p>The soils in the local area are prone to water and wind erosion. Given the low rainfall in the region, and lack of major watercourses or wetlands within the application area, the water erosion risk is minimal. The wind erosion risk is more prominent, particularly on bare soils.</p>
Waterbodies	<p>The desktop assessment and aerial imagery indicate that one minor non perennial watercourse (Change Creek) intersects the application area.</p>
Flora	<p>According to available datasets, 27 priority/threatened flora species have been recorded in the local area (see Section C.2. below). No threatened or priority flora have been recorded within the application area, and the Flora Survey (enhanced reconnaissance) did not identify any threatened or priority flora (GHD, 2018). However, 11 species of priority flora may occur within the application area (see below flora analysis table) based on similarities between the required habitat for these species and that recorded within the application area (GHD, 2018).</p>
Ecological communities	<p>No threatened or priority ecological communities are mapped within or near to the application area.</p>
Fauna	<p>Six conservation significant fauna species have been recorded in the local area (see Section C.3. below). Of these, one species was recorded in the application area, the malleefowl (GHD, 2018). No other conservation significant fauna species were considered likely to occur.</p>

C.2. Flora analysis table

The below flora species have been recorded within the local area. The likelihood of occurrence of each species is included, based on the above site characteristics (informed by the Flora Survey and desktop analysis) relative to the known habitat for each of these species. The Flora Survey undertaken was an enhanced reconnaissance and was not adequate to identify the potential presence of the below listed flora within the application area.

Species name	Conservation status (where 'P' denotes Priority)	Likelihood of occurrence (based on suitability of habitat in the application area)	Distance of closest record to application area (km)
<i>Acacia coatesii</i>	P1	Possible: some suitable habitat exists	18.06
<i>Acacia crenulata</i>	P3	Unlikely: no suitable habitat exists	16.90
<i>Acacia websteri</i>	P1	Likely: suitable habitat exists	13.75
<i>Alyogyne sp. Great Victoria Desert</i>	P3	Possible – limited habitat information available	14.81
<i>Alyxia tetanifolia</i>	P3	Unlikely: no suitable habitat exists	18.59
<i>Austrostipa frankliniae</i>	P2	Possible: some suitable habitat exists	17.18
<i>Chrysocephalum apiculatum subsp. norsemanense</i>	P3	Unlikely: no suitable habitat exists	14.49
<i>Dampiera plumosa</i>	P1	Possible: some suitable habitat exists	16.33
<i>Eremophila acutifolia</i>	P3	Possible: some suitable habitat exists	9.48
<i>Eremophila caerulea subsp. merrallii</i>	P4	Possible: some suitable habitat exists	17.46
<i>Eremophila praecox</i>	P2	Possible: some suitable habitat exists	19.93
<i>Eremophila veronica</i>	P3	Unlikely: no suitable habitat exists	14.43
<i>Eucalyptus jutsonii subsp. jutsonii</i>	P4	Unlikely: no suitable habitat exists	17.17
<i>Eucalyptus websteriana subsp. norsemanica</i>	P1	Unlikely: no suitable habitat exists	19.51
<i>Gastrolobium graniticum</i>	Threatened	Unlikely: no suitable habitat exists	14.81
<i>Goodenia salina</i>	P2	Unlikely: no suitable habitat exists	15.32
<i>Grevillea georgeana</i>	P3	Unlikely: no suitable habitat exists	14.60
<i>Isolepis australiensis</i>	P3	Unlikely: no suitable habitat exists	15.32
<i>Lepidium merrallii</i>	P2	Unlikely: no suitable habitat exists	14.81
<i>Notisia intonsa</i>	P3	Unlikely: no suitable habitat exists	15.32
<i>Phebalium clavatum</i>	P2	Unlikely: no suitable habitat exists	12.25
<i>Phlegmatospermum ermaeum</i>	P3	Unlikely: no suitable habitat exists	15.95
<i>Pterostylis xerampelina</i>	P1	Possible: some suitable habitat exists	5.87
<i>Stylidium choreanthum</i>	P3	Unlikely: no suitable habitat exists	18.64
<i>Styphelia rectiloba</i>	P3	Unlikely: no suitable habitat exists	14.39
<i>Thryptomene planiflora</i>	P1	Likely: large areas of suitable habitat occur	2.27
<i>Thryptomene sp. Coolgardie (E. Kelso s.n. 1902)</i>	P1	Possible – limited habitat information available	14.81

C.3. Fauna analysis table

Species name	Conservation status (state listing)	Likelihood of occurrence (based on suitability of habitat in the application area)	Distance of closest record to application area (km)
<i>Actitis hypoleucos</i> (common sandpiper)	Migratory, protected under international agreement (MI)	Unlikely: no suitable habitat exists	11.40
<i>Jalmenus aridus</i> (desert blue butterfly)	P1	Unlikely: the species has been recorded 19 kilometres north at Lake Douglas and is unlikely to utilise the application area	19.00
<i>Leipoa ocellata</i> (malleefowl)	Vulnerable	Known: Species was recorded during the survey within suitable habitat, which is present throughout much of the site.	Recorded within the application area
<i>Ogyris subterrestris petrina</i> (arid bronze azure butterfly)	Critically endangered	Highly unlikely: the species is considered extinct from the region. It was last recorded 23km to the north in 1991.	15.37
<i>Tringa brevipes</i> (grey-tailed tattler)	P4	Unlikely: no suitable habitat exists	16.94
<i>Tringa nebularia</i> (common greenshank)	MI	Unlikely: no suitable habitat exists	11.40

C.4. Land degradation risk table

Risk categories	Land Unit 1
Wind erosion	M1: 10-30% of the map unit has a high to extreme hazard
Water erosion	L2: 3-10% of the map unit has a very high to extreme hazard
Salinity	L2: 3-10% of the map unit has a moderate or high hazard or is presently saline
Subsurface Acidification	M2: 30-50% of the map unit has a high susceptibility
Flood risk	L1: <3% of the map unit has a moderate to high hazard
Water logging	L2: 3-10% of the map unit has a moderate to very high to risk
Phosphorus export risk	L2: 3-10% of the map unit has a high to extreme hazard

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The Flora Survey identified 83 flora taxa (including subspecies and varieties) representing 26 families and 44 genera in the application area. This included 80 native and three introduced species. Dominant families recorded from the application area included (GHD, 2018):</p> <ul style="list-style-type: none"> • Scrophulariaceae (15 taxa) • Myrtaceae (12 taxa) • Chenopodiaceae & Fabaceae (9 taxa) 	May be at variance	Yes <i>Refer to Section 3.2.1 above</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>The flora species recorded in the application area have previously been recorded in the Coolgardie IBRA bioregion and are not considered to be dependent on the application area. The application area does not contain vegetation in better condition than that in the surrounding region.</p> <p>The Flora Survey (enhanced reconnaissance) did not identify any threatened or priority ecological communities or threatened or priority flora within the application area (GHD, 2018). Although, it is noted that a follow up targeted flora survey is required to determine the potential presence of 11 priority flora which may occur within the application area. This will be a conditional requirement of the clearing permit, as outlined under Section 3.2.2.</p> <p>Therefore, the extent of biodiversity within the application will depend on the findings of the targeted survey. The clearing permit requires for Priority flora species to be avoided, and a 20m buffer retained around P1 species, and a 10m buffer retained around all priority species, which will limit impacts to biodiversity.</p>		
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The application area contains suitable habitat, including breeding habitat (nesting mounds) for malleefowl (<i>Leipoa ocellata</i>), which was recorded within the application area (GHD, 2018). The applicant will be required to undertake a targeted survey for nesting mounds of this species and avoid any active nesting mounds identified, including surrounding critical habitat (as discussed under Section 3.2.1).</p> <p>The application area is not likely to provide significant habitat for any other conservation significant fauna species.</p>	At variance	Yes <i>Refer to Section 3.2.1 above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>According to available datasets, no threatened flora species have been recorded within the application area. One threatened flora species was recorded within the local area (see Table C.2.). The application area does not provide suitable habitat for this species, and the proposed clearing is not likely to impact on this species.</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>According to available datasets, and flora surveys of the application area, the vegetation within the application area is not representative of any known threatened ecological communities.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of native vegetation in the local area is around 94 per cent. The mapped vegetation associations in the application area retain greater than 95 per cent of their pre-European extent. Therefore, the proposed clearing is not within an extensively cleared area.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The application area is adjacent to the Karramindie State Forrest and Yallari Timber Reserve. The proposed clearing may increase the risk of weeds spreading into these conservation areas.</p> <p>As a condition of the clearing permit, the applicant will be required to undertake weed hygiene measures to reduce this risk. The applicant has also developed a weed management procedure, which notes that the following measures will be undertaken as part of the project to reduce the risk of spreading weeds (Mineral Resources Limited, 2021):</p> <ul style="list-style-type: none"> • train personnel responsible for the transfer of earthmoving equipment and vehicles between sites in weed hygiene requirements • ensure vehicles or earthmoving equipment leaving a mine is clean so that it is free of vegetation or dirt, and, following an inspection, ensure a Weed Hygiene Certificate (WHC) is issued • provide specialist training (chemical handling, personal protection etc.) if site personnel are involved in chemical weed control • if populations of declared or pest plants occur on site, control will be undertaken in consultation with DPIRD • if populations of environmental weeds occur on site, control should be undertaken where it is practical to do so. <p>It is considered that these measures, and the clearing permit condition, will appropriately manage the risk of spreading weeds into Karramindie State Forrest and Yallari Timber Reserve.</p>	May be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>A minor non perennial watercourse is mapped as transecting part of the application area (Change Creek). This area was recorded as VT01 (GHD, 2018).</p> <p>The Flora Survey notes that the flora species recorded within VT01, being <i>Eucalyptus</i> species over a suite of <i>Acacia</i> species and <i>Eremophila</i> species shrubs, are not considered riparian species, and that these are commonly found within the larger application area (GHD, 2018).</p> <p>To ensure that the proposed clearing does not significantly impact on this watercourse, the applicant will be required to avoid and provide a 50-metre</p>	At variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
buffer to the minor-non perennial watercourse (with the exception of a crossing if required), in accordance with a condition of the clearing permit.		
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils are susceptible to wind and water erosion. The applicant has advised that the proposed clearing for exploration purposes will be limited to pads, tracks and sumps and will exclude any requirement for the clearing of extensive contiguous areas (Mineral Resources Limited, 2021).</p> <p>The applicant also notes that clearing methods have been developed to minimise erosion, including a commitment to rehabilitating temporarily cleared areas (Mineral Resources Limited, 2021).</p> <p>As a condition of the clearing permit, the applicant will be required to undertake exploration activities within three months of clearing to limit the exposure of bare sandy soils.</p> <p>Given the limited extent of clearing and the vast vegetation cover nearby, the proposed clearing is not likely to result in appreciable land degradation.</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>The applicant notes that the proposed clearing will not intercept groundwater, which occurs at around 50 metres below the surface (Mineral Resources Limited, 2021). The proposed clearing of up to 200 ha within a larger footprint area of 5,215.3 ha is not likely to lead to a rise in groundwater levels.</p> <p>The proposed clearing may result in minor sedimentation of the minor non-perennial watercourse that intersects the application area, particularly after heavy rainfall events. While this impact is likely to be short term and localised, the applicant will be required to avoid, and provide a 50-metre buffer to the minor-non perennial watercourse (with the exception of a crossing if required), in accordance with a condition of the clearing permit.</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>The climate of the region is described as semi-arid with an average annual rainfall of 265 mm. The applicants supporting information notes that based on an average daily evaporation rate of 7.2 mm, any surface water resulting from rainfall events is likely to be relatively short lived, even in bare areas post clearing (Mineral Resources Limited, 2021)</p> <p>The survey area is characterised by flat to gently undulating plains with silty clay soils and occasional rocky rises scattered throughout the survey area (GHD, 2018).</p> <p>Noting that the application area is surrounded by extensive tracts of remnant vegetation, run-off and surface flows will be limited, and the risk of flooding is considered low.</p>	Not likely to be at variance	No

Appendix E. 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 Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.).




Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix F. Biological survey information excerpts

GHD was commissioned to undertake an enhanced reconnaissance survey of the application area from 21–23 March 2018. The methods used are described under Section 3.2.1 (fauna) and 3.2.2 (flora).

The vegetation and landform types, and associated locations of these within the application area are shown in the table and figure below.

Vegetation type	Vegetation Type Description	Landform and Substrate	Extent (ha)	Vegetation Association, relevé and photo point reference	Photograph
<i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i> and <i>E. griffithsii</i> open woodland (VT01)	<i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i> and <i>E. griffithsii</i> open woodland over <i>Eremophila</i> spp., <i>Acacia</i> spp. mid shrubland	Drainage lines with silty orange soils	215.97	Associations: 9 & 936 Relevés: 48, 53 & 64 Photo Point: 28	
<i>Eucalyptus</i> spp. isolated trees over tall shrubland (VT02)	<i>Eucalyptus</i> spp. isolated trees over <i>Melaleuca uncinata</i> , <i>Acacia acuminata</i> tall shrubland over <i>Prostanthera grylloana</i> low open shrubland	Plains of silty orange soil	517.14	Association: 9 Relevés: 54 & 56 Photo Point: 20 & 22	
<i>Eucalyptus</i> spp. woodland over open hummock grassland (VT03)	<i>Eucalyptus</i> spp. woodland over <i>Acacia</i> spp., <i>Eremophila</i> spp. tall open shrubland over <i>Triodia</i> sp. open hummock grassland	Plains of silty orange soil	450.49	Association: 9 Relevés: 51, 55, 58 & 59 Photo Points: 18 & 19	
Mixed open shrubland over herbland (VT04)	<i>Acacia acuminata</i> , <i>Melaleuca eleuterostachya</i> , <i>Eremophila serrulata</i> mid open shrubland over <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> , <i>Asteraceae</i> sp. open herbland	Granite outcrops over clay	5.02	Associations: 128 Relevés: 60	
<i>Eucalyptus</i> spp. over <i>Melaleuca</i> spp./ <i>Allocasuarina</i> sp. tall sparse shrubland (VT05)	<i>Eucalyptus</i> spp. open woodland over <i>Melaleuca sheathiana</i> , <i>M. lanceolata</i> , <i>Allocasuarina acutivalvis</i> subsp. <i>acutivalvis</i> tall sparse shrubland over <i>Senna artemisioides</i> , <i>Halgania andromedifolia</i> low open shrubland	Plain with silty orange soils	860.96	Association: 936 Relevés: 52, 61, & 62 Photo Points: 23, 24, 25 & 30	
Mosaic <i>Eucalyptus</i> spp. woodland (VT06)	<i>Eucalyptus</i> spp. woodland over <i>Acacia hemiteles</i> , <i>Eremophila</i> spp. tall shrubland over chenopod low open shrubland	Plain with silty orange soils	1,944.45	Association: 9 & 936 Relevé: 49, 50, 63, 65 & 67 Photo Points: 26 & 29	
<i>Eucalyptus</i> spp. woodland over quartz (VT07)	<i>Eucalyptus</i> spp. open woodland over <i>Senna artemisioides</i> , <i>Eremophila scoparia</i> , <i>Atriplex vesicaria</i> mid shrubland	Silty orange soils with occasional quartz	1,153.09	Association: 9 Relevés: 57 & 66 Photo Points: 21 & 27	
Cleared/ track/ road	NA		67.19		

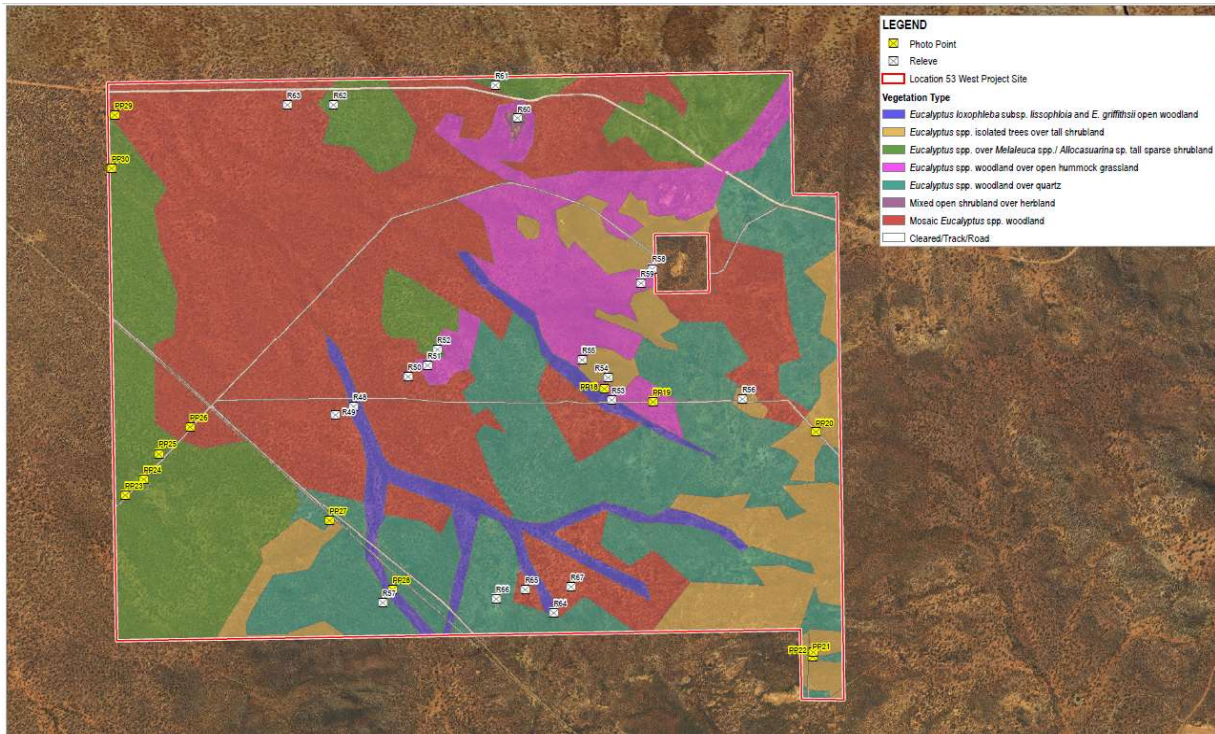


Figure 2. Mapped vegetation types across the application area (GHD, 2018).

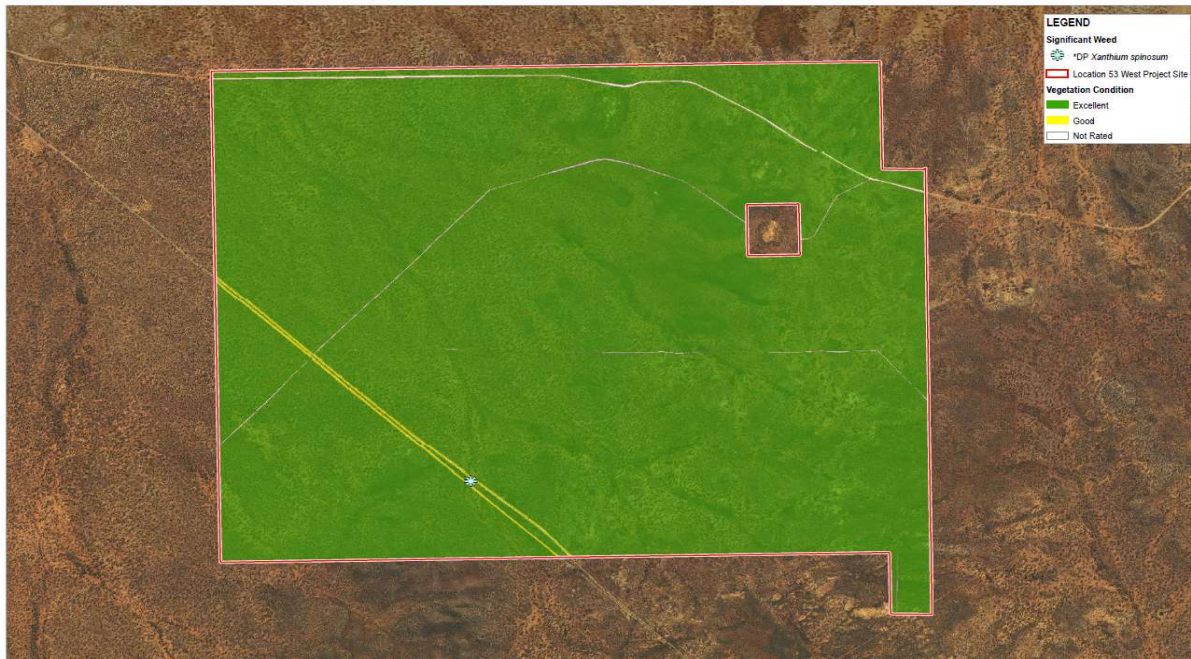


Figure 3. Mapped vegetation condition within the application area (GHD, 2018).

Appendix H. Sources of information

H.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- 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)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- IBRA Vegetation Statistics
- 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 – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available

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)

H.2. References

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