

# Application to Amend NVCP CPS 4468/3 Jinidi Exploration

Native Vegetation Clearing Permit Amendment  
Application Supporting Document

June 2024



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## 1 INTRODUCTION

BHP Billiton Iron Ore Pty Ltd (BHP) currently operates a number of Iron Ore mines and associated rail and port infrastructure within the Pilbara region of Western Australia (WA). Current mining operations include the:

- Newman Operations consisting of:
  - The Mount Whaleback hub (including Orebodies 29, 30 and 35) located approximately two kilometres (km) west of Newman Township; and;
  - The Eastern Ridge hub (Consisting of Orebodies 23, 24, 25 25 West and 32) located approximately 5 km east of Newman Township;
- Mining Area C / South Flank located approximately 90 km north west of Newman Township;
- Orebodies 18 and Wheelarra Hill (Jimblebar) Mine located approximately 35 km east of Newman Township; and
- Yandi Mine located approximately 100 km north west of Newman Township.

Ore from the above mining operations is transported to Port Hedland via the BHP Newman to Port Hedland Mainline (and associated spur lines) and is then shipped out through Port Hedland at the BHP facilities at Nelson Point and Finucane Island.

BHP currently holds Native Vegetation Clearing Permit (NVCP) CPS 4468/3 for the purposes of mineral exploration and associated activities (**Figure 1**). BHP is currently undertaking detailed infill drilling program at Jinidi and have identified the need to make the following amendments to CPS4468/3:

- Amend the purpose to: "Clearing for the purposes of mineral exploration, geotechnical investigations, hydrological investigations, installation of meteorological masts and LiDAR stations and any associated activities.";
- Increase the permit boundary from 12,855 ha to 14,787 ha;
- Increase the disturbance limit from 417.45 hectares (ha) to 750 ha.
- Extend the permit duration to 30 November 2036;
- Extend the clearing period to 30 November 2031; and
- Extend the final reporting date to 30 November 2036.

No other changes to the permit are required.

In accordance with Part V Division 2 of the *Environmental Protection Act 1986* (EP Act), BHP hereby refers the application to amend NVCP CPS 4468/3 to the Department of Energy, Mines, Industry Regulation and Safety (DMIRS).

BHP considers that the proposed amendment application will not result in any significant environmental or social impacts and that the proposed Project complies with the 'Ten Clearing Principles', as defined in Schedule 5 of the *Environmental Protection Act 1986* (EP Act).

### 1.1 LOCATION

The Amendment Application Area is located approximately 50 km northwest of Newman in the Pilbara region of Western Australia (**Figure 1**).

### 1.2 TENURE

The Amendment Application Area is located on State Agreement Mineral Lease 244SA.

### 1.3 LOCAL GOVERNMENT JURISDICTION

The Amendment Application Area is located within the Shire of East Pilbara.

### 1.4 PROPONENT

The Project is managed and operated by BHP Iron Ore on behalf of the owners, the Mount Goldsworthy Joint Venture (MGJV). The split between the partners of the MGJV is as follows:

- |  |     |
|--|-----|
| • BHP Minerals Pty Ltd                         | 85% |
| • Itochu Minerals and Energy Australia Pty Ltd | 5%  |
| • Mitsui Iron Ore Corporation Pty Ltd          | 10% |

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## 1.5 PROJECT DESCRIPTION

The proposed works will involve clearing for the purposes of mineral exploration, geotechnical investigations, hydrological investigations, installation of meteorological masts and LiDAR stations and any associated activities.

## 1.6 PROJECT CHARACTERISTICS AND COMMITMENTS.

BHP commits to undertake the Project in accordance with the details set out in **Table 1**.

**Table 1 Project Characteristics and Commitments**

Permit Characteristics	
Authorising Agency	DEMIRS
Permit Title	Jinidi Exploration Project
Area to be cleared	750 hectares
Amendment Application Area	14,787 ha
Purpose of the permit	Clearing for the purposes of mineral exploration, geotechnical investigations, hydrological investigations, installation of meteorological masts and LiDAR stations and any associated activities.
Tenure	Mineral Lease 244SA.
Clearing Duration	Until 30 November 2031
Permit Duration	Until 30 November 2036
Proposed Annual Reporting Date	01 October for the previous Financial Year
Proposed Final Reporting Date	30 November 2036
Application boundary	Map Reference: <ul style="list-style-type: none"> <li>• EXP_026NVCP_001_RevA_0</li> <li>• EXP_026NVCP_002_RevA_0</li> <li>• EXP_026NVCP_003_RevA_0</li> <li>• EXP_026NVCP_004_RevA_0</li> <li>• EXP_026NVCP_005_RevA_0</li> </ul> BHP Shapefile D2 Reference: <a href="https://waio-dctm.bhp.com/D2/?docbase=bhpbio_od_prod&amp;locateld=0b03c41a8474a6a6&amp;application=ManagedDocuments">https://waio-dctm.bhp.com/D2/?docbase=bhpbio_od_prod&amp;locateld=0b03c41a8474a6a6&amp;application=ManagedDocuments</a>
Application Commitments	Section
Populations of Priority flora will be avoided by a 10 m buffer where practicable.	3.4.2 6.1
Control of established weed populations will be carried out according to BHP's standard Weed Control and Management Procedures.	3.4.3 6.7.4
Active Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable.	3.4.4 6.2
Active Pebble-mouse mounds will be avoided using a 10 m buffer, where practicable.	3.4.4 6.2
Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.	3.6 6.6 6.9

**1.7 NVCP RECORDS**

BHP reports on each NVCP in accordance with the permit reporting conditions. For a majority of NVCPs this is incorporated into BHP Iron Ore's Annual Environmental Report (AER) which is submitted to government prior to the 01 October each year.

Clearing has been minimised by restricting activities to the minimal required for safety and equipment access and where practical previously cleared areas are utilised rather than clearing new locations.

Populations of significant flora have been avoided using the BHP Project Environmental and Heritage Review (PEAHR) procedure. This internal BHP procedure authorises ground disturbing activities.

No environmental offsets are required for this NVCP.

Clearing commenced in 2011 with a total of 286.30 ha cleared and 175.36 ha rehabilitated to the end of FY23 (BHP, 2023). The remaining cleared areas still required for the purpose for which they were cleared.

BHP has recently concluded an internal review of clearing to date within CPS 4468/3 and identified that the permit limit was exceeded by 4.6 ha (total of 423.05 ha). This event was verbally reported to DEMIRS on 19 of June 2024 and via letter on 27 June 2024.

**2 ASSOCIATED APPROVALS**

Any other additional approvals will be sought as required.

### **3 EXISTING ENVIRONMENT**

#### **3.1 CLIMATE**

Newman Aero meteorological site (007176) is the closest Bureau of Meteorology (BoM) station to the Amendment Application Area. Average annual rainfall at Newman Aero is 318.0 mm (BOM, 2024a). This is mainly derived from tropical storms and cyclones during summer, producing sporadic, heavy rains over the area. Mean monthly rainfall varies from 4.6 mm in September to 71.6 mm in February (BoM, 2024a). Daily rainfall is highly variable; the highest maximum daily rainfall ranges from 34.8 mm in October, to 305.6 mm in February (BoM, 2024a). The mean maximum temperature in summer months (October to March) is 35.2°C to 39.4°C, and mean maximum temperature in winter (April to September) is between 23.0°C and 32.1°C (BoM, 2024a).

Wittenoom meteorological site (005026) is the closest station to the Amendment Application Area that records daily evaporation. Wittenoom is located approximately 120 km northwest of the Amendment Application Area. Mean daily evaporation at Wittenoom throughout the year is 8.6 mm/day (BoM, 2023b), which equates to 3.1 metres per year. Evaporation greatly exceeds rainfall in the region throughout the year and on a month-by-month basis (BoM, 2024b).

#### **3.2 BIOREGION, LANDFORMS AND LAND SYSTEMS**

The Amendment Application Area is situated in the following biogeographic sub-region:

- Hamersley subregion (PIL3) of the Pilbara region described as: *“Mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors, and Eucalyptus leucophloia over Triodia brizoides on skeletal soils of the ranges. The climate is semi-desert tropical, average 300 mm rainfall, usually in summer cyclonic or thunderstorm events. Winter rain is not uncommon. Drainage into either the Fortescue (to the north), the Ashburton to the south, or the Robe to the west. Subregional area is 6,215,092ha”* (Kendrick, 2001).

The proposed Amendment Application Area is also located in the following land systems, as mapped by van Vreeswyk et al. (2004):

- Boolgeeda:** Stony lower slopes, level stony plains and narrow sub-parallel drainage floors, relief up to 20 metres (m). A common system in shallow valleys below hill systems such as Newman and Rocklea.
- Egerton:** Highly dissected hardpan plains, slopes and narrow drainage floors, relief up to 20 m.
- McKay:** Hills, ridges, plateaux remnants and minor breakaways of sedimentary and meta sedimentary rocks, relief up to 100 m.
- Newman:** Rugged high mountains, ridges and plateaux with near vertical escarpments of jaspilite, chert and shale, the second largest system in the survey area and prominent in southern parts (e.g. Ophthalmia Range, Hamersley Range), relief up to 450 m.
- Oakover:** Prominent plateaux, mesas and buttes of calcrete with lower plains with highly calcareous soils, similar to Table system, differing mainly in the vegetation it supports, relief up to 60 m.
- Platform:** Narrow, raised plains and highly dissected slopes on partly consolidated colluvium below the footslopes of hill systems such as Newman, relief mostly up to about 30 m but occasionally considerably greater.
- Rocklea:** Rough hill and mountain tracts predominantly of basalt, the largest land system in the survey area and widespread throughout, relief up to 110 m.
- Spearhole:** Level to gently undulating hardpan wash plains with abundant to very abundant surface mantles of ironstone pebbles and prominent grove patterns of vegetation, widely spaced tributary drainage channels, low rises and dissected slopes with relief up to 35 m.

These Land Systems are well represented in their bioregions.

**3.3 GEOLOGY AND SOILS**

The Australian Soil Resource Information System (ASRIS) provides soil and land resource information across Australia. The following two soil types occur within the Amendment Application Area (CSIRO, 2021):

- Fa13: Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5.11) soils on the steeper slopes. Associated are (Dr2.33 and Dr2.32) soils on the limited areas of dissected pediments, while (Um5.52) and (Uf6.71) soils occur on the valley plains.
- Fa14: Steep hills and steeply dissected pediments on areas of banded jaspilite and chert along with shales, dolomite, and iron ore formations; some narrow winding valley plains: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5.11) soils on the steeper slopes. (Dr2.33, Dr2.32) soils which occur on the pediments are more extensive in this unit than in unit Fa13. (Um5.52) and (Uf6.71) soils occur on the valley plains.

**3.4 FLORA, VEGETATION AND FAUNA**

There have been 15 flora and vegetation surveys across the Amendment Application Area. The most relevant surveys are:

- Jinidi Detailed Flora and Vegetation Survey Interim Report: Dry-season (Biologic, 2024a) (**Appendix 1**);
- *Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure* (Onshore Environmental, 2014) (**Appendix 2**); and
- *Flora and vegetation Review Jinidi Iron ore Project* (Onshore Environmental, 2012);

There have been 14 vertebrate fauna surveys across the Amendment Application Area. The most relevant surveys are:

- Jinidi Targeted Vertebrate Fauna Survey (Biologic, 2024b) (**Appendix 3**); and
- Jinidi Vertebrate Fauna Survey (Biota, 2011).

**3.4.1 Vegetation Communities**

The Amendment Application Area is located within the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara Bioregion (Department of Environment and Heritage, 2005). According to the Government of Western Australia (2013), this bioregion is more than 99.9% vegetated (**Table 2**). The vegetation within the Amendment Application Area is classified as the following vegetation associations, as mapped by Beard (1975):

- 18 Low woodland; mulga (*Acacia aneura*)
- 82 Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

There is more than 99% of the pre-European vegetation remaining of these vegetation associations (**Table 2**). The Amendment Application Area is not part of any significant remnant vegetation in the wider regional area.

**Table 2 Pre European extent of vegetation associations occurring within the Amendment Application Area (Shepherd *et al.*, 2001)**

Vegetation Association	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	Pre-European % in IUCN Class I-IV Reserves
Pilbara IBRA Bioregion	17,808,657	17,733,584	99.58	6.34
Vegetation type 18 in Western Australia	19,890,664	19,843,409	99.76	2.13
Vegetation type 18 in the Pilbara IBRA Bioregion	676,556	672,424	99.39	16.78
Vegetation association 82 within Western Australia	2,565,901	2,553,217	99.51	10.25
Vegetation association 82 within the Pilbara IBRA	2,563,583	2,550,899	99.51	10.26



A total of eight broad floristic formations with twenty four vegetation associations have been described and mapped within the Amendment Application Area (**Figure 2 and Table 3**).

**Table 3 Vegetation associations of the Amendment Application Area (Onshore 2014)**

Broad Floristic Formation	Vegetation Association Description	
Acacia Low Open Forest	HC AcaoAa Ep Segl	Low Open Forest of <i>Acacia catenulata</i> subsp. <i>occidentalis</i> and <i>Acacia aptaneura</i> with Very Open Mallee of <i>Eucalyptus pilbarensis</i> and Open Shrubland of <i>Senna glutinosa</i> subsp. <i>x luerssenii</i> on breakaways with brown sandy loam.
	HS AcaoAaApr ScaErlAb TbrTw	Low Open Forest of <i>Acacia catenulata</i> subsp. <i>occidentalis</i> , <i>Acacia aptaneura</i> and <i>Acacia pruinocarpa</i> over Open Shrubland of <i>Scaevola acacioides</i> , <i>Eremophila latrobei</i> subsp. <i>latrobei</i> and <i>Acacia bivenosa</i> over Open Hummock Grassland of <i>Triodia brizoides</i> and <i>Triodia wiseana</i> on red brown clay loam on breakaway scree slopes and steep hill slopes.
	SP AaApr ErcuColpSo p TpTw	Low Open Forest of <i>Acacia aptaneura</i> and <i>Acacia pruinocarpa</i> over with Low Open Shrubland of <i>Eremophila cuneifolia</i> , <i>Corchorus lasiocarpus</i> subsp. <i>parvus</i> and <i>Solanum phlomoides</i> over Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia wiseana</i> on red brown clay loam on stony plains.
Acacia Open Scrub	MI AmAnlAanc Tp EICh	Open Scrub of <i>Acacia monticola</i> , <i>Androcalva luteiflora</i> and <i>Acacia ancistrocarpa</i> with Open Hummock Grassland of <i>Triodia pungens</i> and Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> on minor drainage lines with brown sandy loam.
	MI AtpPIAm TpTs ChEII	Open Scrub of <i>Acacia tumida</i> var. <i>pilbarensis</i> , <i>Petalostylis labicheoides</i> and <i>Acacia monticola</i> over Open Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia</i> sp. Shovelanna Hill (S.van Leeuwen 3835) with Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> on red brown sandy loam on minor drainage lines.
Corymbia Low Woodland	GG CfEIIFib AhDovmAsh a CyaErnuTh mb	Low Woodland of <i>Corymbia ferriticola</i> , <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Ficus brachypoda</i> over Open Shrubland of <i>Acacia hamersleyensis</i> , <i>Dodonaea viscosa</i> subsp. <i>mucronata</i> and <i>Astrotricha hamptonii</i> over Open Tussock Grassland of <i>Cymbopogon ambiguus</i> , <i>Eriachne mucronata</i> and <i>Themeda</i> sp. Mt Barricade on red brown loam along cliff lines and gorge walls.
Eucalyptus Low Open Forest	MA EcrEvEx AypAtpGor o TtEuaCyp	Low Open Forest of <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> , <i>Eucalyptus victrix</i> and <i>Eucalyptus xerothermica</i> over High Shrubland of <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> , <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Gossypium robinsonii</i> over Open Tussock Grassland of <i>Themeda triandra</i> , <i>Eulalia aurea</i> and <i>Cymbopogon procerus</i> on red brown clay loam on major drainage lines.
Petalostylis Shrubland	MI PIAtpAm ChEII TwTp	Shrubland of <i>Petalostylis labicheoides</i> , <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia monticola</i> with Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Hummock Grassland of <i>Triodia wiseana</i> and <i>Triodia pungens</i> on red brown loam on minor drainage lines.
Themeda Tussock Grassland	MA TtCc PIAbAnl EIICh	Tussock Grassland of <i>Themeda triandra</i> and * <i>Cenchrus ciliaris</i> with Shrubland of <i>Petalostylis labicheoides</i> , <i>Acacia bivenosa</i> and <i>Androcalva luteiflora</i> and Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> on red brown loam on drainage levees.
Triodia Hummock Grassland	CP TwTa Ese AbPIAyp	Hummock Grassland of <i>Triodia wiseana</i> and <i>Triodia angusta</i> with Open Mallee of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> and Open Shrubland of <i>Acacia bivenosa</i> , <i>Petalostylis labicheoides</i> and <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> on light brown clay loam on calcrete plains and rises.
	FS Ts CdHc AancAiGrwh	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of <i>Corymbia deserticola</i> subsp. <i>deserticola</i> and <i>Hakea chordophylla</i> over Open Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia inaequilatera</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> on red brown sandy loam on footslopes and stony plains.
	FS TsTpTw EII AbApaAanc	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835), <i>Triodia pungens</i> and <i>Triodia wiseana</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and Open Shrubland of <i>Acacia bivenosa</i> , <i>Acacia pachyachra</i> and <i>Acacia ancistrocarpa</i> on red brown loam on footslopes, low undulating hills and stony plains.
	HC TbrTw Ab Ep	Hummock Grassland of <i>Triodia brizoides</i> and <i>Triodia wiseana</i> with Open Shrubland of <i>Acacia bivenosa</i> and Very Open Mallee of <i>Eucalyptus pilbarensis</i> on steep scree slopes with brown sandy loam.

Broad Floristic Formation	Vegetation Association Description	
	HC TpTwTs EiCh AarGooKeve	Hummock Grassland of <i>Triodia pungens</i> , <i>Triodia wiseana</i> and <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwin 3835) with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> over Low Shrubland of <i>Acacia arida</i> , <i>Gompholobium oreophilum</i> and <i>Keraudrinia velutina</i> subsp. <i>elliptica</i> on red brown loam on hill crests and upper hill slopes.
	HC Tw Ah EkkEgCh	Hummock Grassland of <i>Triodia wiseana</i> with Shrubland of <i>Acacia hamersleyensis</i> and Open Mallee of <i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i> , <i>Eucalyptus gamophylla</i> and <i>Corymbia hamersleyana</i> (mallee form) on red brown loam and silty loam on hill crests.
	HS TbrTw Eii	Hummock Grassland of <i>Triodia brizoides</i> and/or <i>Triodia wiseana</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> on brown sandy loam on steep hill slopes.
	HS TsTp EiIAaApr AiAancAb	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) and <i>Triodia pungens</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Acacia aptaneura</i> and <i>Acacia pruinocarpa</i> with High Open Shrubland of <i>Acacia inaequilatera</i> , <i>Acacia ancistrocarpa</i> and <i>Acacia bivenosa</i> on hillslopes with brown sandy loam.
	HS TsTw Eg GrwhSeggA b	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) and <i>Triodia wiseana</i> with Very Open Mallee of <i>Eucalyptus gamophylla</i> over Open Shrubland of <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> , <i>Senna glutinosa</i> subsp. <i>glutinosa</i> and <i>Acacia bivenosa</i> on red brown sandy clay loam on hill slopes.
	HS TsTwTp EiCh AhiAaa	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835), <i>Triodia wiseana</i> and <i>Triodia pungens</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> over Low Open Shrubland of <i>Acacia hilliana</i> and <i>Acacia adoxa</i> var. <i>adoxo</i> on red brown sandy loam on hill slopes.
	HS Tw Ab Ese	Hummock Grassland of <i>Triodia wiseana</i> with Open Shrubland of <i>Acacia bivenosa</i> and Very Open Mallee of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> on undulating calcrete low hills with brown sandy clay loam.
	ME TpTlo ExAciCh PIApyGoro	Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia longiceps</i> with Low Woodland of <i>Eucalyptus xerothermica</i> , <i>Acacia citrinoviridis</i> and <i>Corymbia hamersleyana</i> over High Shrubland of <i>Petalostylis labicheoides</i> , <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> and <i>Gossypium robinsonii</i> on red brown clay loam on medium drainage lines and surrounding floodplains.
	SP TbTp HiAancAi Ch	Hummock Grassland of <i>Triodia basedowii</i> and <i>Triodia pungens</i> with High Open Shrubland of <i>Hakea lorea</i> subsp. <i>lorea</i> , <i>Acacia ancistrocarpa</i> and <i>Acacia inaequilatera</i> and Scattered Low Trees of <i>Corymbia hamersleyana</i> on red brown loamy sand on stony plains.
Triodia Open Hummock Grassland	ME TpAmAnlApy ExCh	Open Hummock Grassland of <i>Triodia pungens</i> High Shrubland of <i>Acacia monticola</i> , <i>Androcalva luteiflora</i> and <i>Acacia pyrifolia</i> and Low Open Woodland of <i>Eucalyptus xerothermica</i> and <i>Corymbia hamersleyana</i> on medium drainage lines and floodplains with brown sandy loam.
	SP TpTm AaExAcao ApaErffAads	Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia melvillei</i> with Low Open Woodland of <i>Acacia aptaneura</i> , <i>Eucalyptus xerothermica</i> and <i>Acacia catenulata</i> subsp. <i>occidentalis</i> and Open Shrubland of <i>Acacia pachyacra</i> , <i>Eremophila forrestii</i> subsp. <i>forrestii</i> and <i>Acacia adsurgens</i> on red brown clay loam or silty loam on stony plains and floodplains.

The Onshore Environmental (2014) *Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure (Appendix 2)* undertook a detailed review of all previous flora and vegetation surveys across BHP's Pilbara operations (162 baseline flora and vegetation surveys between 2004 and 2013). This review was supported by field visits where the analysis indicated that further information was required to confirm the exact vegetation associations.

Historical survey reports often used different techniques and/or nomenclature, however they generally utilised similar field methods. The Project resolved the inconsistencies between previous vegetation mapping and created one consolidated regional Geographic Information System (GIS) database which:

- Serves as BHP's base line vegetation dataset;
- Maps and describes a total of 53 broad floristic communities with 218 distinct vegetation associations across BHP's Pilbara operations; and
- Provides consistency in methods and nomenclature across BHP's Pilbara operations.

The vegetation consolidation project also identified one Threatened Ecological Community (TEC) and six Priority Ecological Communities (PECs) within the Consolidation Study Area. None of the vegetation associations or landforms identified within the boundary of the Amendment Application Area are associated with a TEC or PEC (Onshore Environmental, 2014). The closest PEC the Weeli Wolli Spring Community (Priority 1) which is approximately 2 km northwest of the Amendment Application Area. The NVCP boundary intersects the buffer of this PEC but there should be no impacts on this PEC based on the proposed activities and the surface water management measures that will be implemented (**Section 3.6**).

The distinct mapped broad floristic communities and vegetation associations identified within Amendment Application Area extend or occur beyond the project boundary. It is considered unlikely that any changes in vegetation associations and local species over the time since the vegetation consolidation project would lead to elevated significance of the vegetation given that none of the vegetation associations identified within the Amendment Application Area were affiliated with any TECs or PECs and there are no vegetation associations within the Amendment Application Area that would be likely to be included in any updates to TEC or PEC listings.

Vegetation condition within the Amendment Application Area ranges from Excellent to completely Degraded.

### **3.4.2 Significant Flora**

No species listed under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) or gazetted as Threatened Flora species under the *Biodiversity Conservation Act, 2016* (BC Act) were identified within the Amendment Application Area.

Ten Priority Flora have been identified adjacent to the Amendment Application Area (**Figure 3; Table 4**):

- *Acacia subtiliformis* (Priority 3);
- *Eremophila naaykensis* (Priority 3);
- *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (Priority 3);
- *Grevillea saxicola* (Priority 3);
- *Gymnanthera cunninghamii* (Priority 3);
- *Hibiscus* sp. Gurinbiddy Range (M.E. Trudgen MET 15708) (Priority 2);
- *Indigofera gilesii* (Priority 3);
- *Lepidium catapycnon* (Priority 4);
- *Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3); and
- *Triodia* sp. Mt Ella (M.E. Trudgen 12739) (Priority 3).

Populations of Priority flora will be avoided using a 10 m buffer, where practicable.

**Table 4: Conservation Significant Flora Occurring within the Application Area (Biologic, 2024a; Onshore Environmental, 2012)**

Conservation Significant Species	Description	Habitat Relevance	Potential Impact on Species
<b>Priority 2 (DBCA)</b>			
<i>Hibiscus</i> sp. Gurinbiddy Range (M.E. Trudgen MET 15708)	<i>Hibiscus</i> sp. Gurinbiddy Range (M.E. Trudgen MET 15708) is a large diffuse perennial shrub 1.5 to 2.5 m tall. It has creamish brown to rusty brown erect star-shaped hairs densely covering all vegetative parts so as to appear woolly in texture. Flowers are pale mauve with a darker mauve marking at the base (DPaW and Rio Tinto, 2015).	The current distribution of <i>Hibiscus</i> sp. Gurinbiddy Range (M.E. Trudgen MET 15708) is restricted to the southeast Pilbara. The distribution is likely to be wider with additional survey work (Onshore Environmental, 2015). It is known to occur in sheltered/ shaded rocky drainage lines, gullies and gorges, often below associated cliff-lines or rocky ridges of massive ironstone hills and mountain ranges across the southern Pilbara from Newman to Paraburdoo (Rio Tinto & WAH, 2015; WAH, 1998-). There are currently 27 records for this species, each of which has a corresponding specimen held at WAH (WAH, 1998-). This species has been recorded from: <ul style="list-style-type: none"> <li>one location within the Amendment Application Area;</li> <li>11 locations in the local region southwest of the Amendment application Area; and</li> <li>six locations in the broader Pilbara ; and</li> <li>two additional locations within Karijini National Park.</li> </ul>	<b>Low</b> The clearing of the record of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>The preferred habitat for this species rocky drainage lines, gullies and gorges is typically too dangerous to access for exploration activities and therefore unlikely to be disturbed by the proposed activities under this permit;</li> <li>This species is known from within Karijini National Park; and</li> <li>The species is distributed throughout the south-eastern Pilbara region and is considered likely to have a wider distribution.</li> </ol>
<b>Priority 3 (DPaW)</b>			
<i>Acacia subtiliformis</i>	A spindly, slender, single-stemmed, erect shrub, growing to 3.5 m in height (WAH, 1998-). The new growth of this species is slightly viscid, resinous, aromatic and produces yellow flowers in June (Maslin, 2018; WAH, 1998-).	<i>Acacia subtiliformis</i> has been recorded in low, undulating country on calcareous rises adjacent to drainage lines and is known only from the Hamersley Range; specifically the Hancock and Ophthalmia Ranges (WAH, 1998-). This species is relatively widely distributed in the Pilbara and has been recorded from: <ul style="list-style-type: none"> <li>one location within the Amendment Application Area; and</li> <li>654 other locations in the Southern Pilbara including: <ul style="list-style-type: none"> <li>a large population (585 records) immediately west of the Amendment Application Area; and</li> <li>one record within Karijini National Park.</li> </ul> </li> </ul>	<b>Low</b> The clearing of the single record of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>This species is known from within Karijini National Park; and</li> <li>There is a large population of this species to the west of the Amendment Application Area; and</li> <li>Other populations across the southern Pilbara.</li> </ol>
<i>Eremophila naaykensis</i>	An erect, usually dome-shaped, shrub growing to 3.5 m high (Curtis et al., 2022; WAH, 1998-). It has fibrous, grey bark with short “velvety” hairy branchlets, pale grey-green leaves with a shiny silver appearance, and resinous young leaves. It produces white-cream to pale purple flowers typical of the genus from June to October (Curtis et al., 2022; WAH, 1998).	<i>Eremophila naaykensis</i> typically occurs on a variety of rocky ironstone hillslope landforms, often forming a mid to tall shrub layer, particularly in gully / gorge situations (Curtis et al., 2022; WAH, 1998-). There are currently 22 records for this taxon, confined to the Pilbara and Gascoyne regions (WAH, 1998). Its distribution is quite restricted, occurring sporadically from Newman to Paraburdoo, extending north to central Karijini. However, observed frequency of individuals at locations can be extremely common, with numbers often in the hundreds in 50x50 m floristic sample sites. The Biologic (2024a) study recorded this species in rocky gullies, ridges, cliffs and on ironstone hills and summits mainly in the northern and south-western sections of the Survey Area. This species is relatively widely distributed in the Pilbara and has been recorded from: <ul style="list-style-type: none"> <li>Four locations within the Amendment Application Area;</li> <li>15 locations the local region and</li> <li>A further 15 locations across the broader Pilbara region; and</li> <li>One record in Karijini National Park.</li> </ul>	<b>Low</b> The clearing of any of the records of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>Key habitat for this species (rocky gullies, ridges, cliffs) are typically too dangerous to access for exploration activities and therefore unlikely to be disturbed by the proposed activities under this permit;</li> <li>This species has a wide distribution across the Pilbara; and</li> <li>This species is known from within Karijini National Park.</li> </ol>
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)	<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727) is an open erect annual or biennial herb that grows up to 0.2 m in height. This species produces yellow flowers between March and September (WAH, 2016).	<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727) occurs in red-brown clay soil with calcrete pebbles on low undulating plains or swampy plains in close proximity to major drainage lines. This species is relatively widely distributed in the southern Pilbara and has been recorded from: <ul style="list-style-type: none"> <li>79 locations within the Amendment Application Area;</li> <li>878 locations adjacent to the Amendment Application Area (to the west and southwest); and</li> <li>A further 63 locations across the Southern Pilbara between Paraburdoo and Mount Cooke.</li> </ul>	<b>Low</b> The clearing of any of the records of this species (if required) within the Application Area would not result in any significant impact upon species distribution as this species relatively widely distributed in the southern Pilbara.
<i>Grevillea saxicola</i>	<i>Grevillea saxicola</i> is a single stemmed tree or tall shrub with grey-black rough bark up to 7 m in height with cream flowers (Onshore Environmental 2015; DPaW and Rio Tinto, 2015).	Based on WA Herbarium records, <i>Grevillea saxicola</i> appears to be restricted to the southern Pilbara. It typically occurs on orange / brown loam soils on steep breakaway and scree slopes (often with southerly aspect) (Onshore Environmental 2015). This species has been recorded from: <ul style="list-style-type: none"> <li>29 locations within the Amendment Application Area;</li> <li>18 locations adjacent to the west and southwest of the Amendment Application Area;</li> <li>eight locations within Karijini National Park; and</li> <li>59 other locations across the broader region.</li> </ul>	<b>Low</b> While restricted to the southern Pilbara, the clearing of any of the records of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>This species is found across the broader southern Pilbara; and</li> <li>This species is known from within Karijini National Park.</li> </ol>
<i>Gymnanthera cunninghamii</i>	<i>Gymnanthera cunninghamii</i> is an erect shrub up to 2 m in height and producing cream, yellow or green flowers year round, grows in sandy soils along medium to large drainage lines.	This species is widespread throughout northern Australia, and is recorded sporadically in Western Australia. This species has been recorded from: <ul style="list-style-type: none"> <li>four records within the Amendment Application Area;</li> <li>one record adjacent to the west of the Amendment Application Area;</li> <li>70 other records across the Pilbara bioregion; and</li> <li>throughout northern Australia..</li> </ul>	<b>Low</b> This species is widespread across northern Australia and is broadly distributed across the Pilbara IBRA region. There are multiple records of this species outside of the Application Area and if required the clearing of these four records would not result in any significant impact upon species distribution.

Conservation Significant Species	Description	Habitat Relevance	Potential Impact on Species
<i>Indigofera gilesii</i>	<i>Indigofera gilesii</i> is a shrub growing up to 1.5 m in height. It produces pink or purple flowers between May and August (Onshore Environmental, 2015).	<i>Indigofera gilesii</i> is widely distributed within the southeast Pilbara (west of Newman) and represented in three other bioregions extending east to the Northern Territory border and south to Wiluna. This species is generally found in pebbly loam amongst boulders and outcrops amongst hills. Within and adjacent to the Application Area this species has been recorded on rocky hill tops and creek lines. This species has been recorded from: <ul style="list-style-type: none"> <li>• four locations within the Amendment Application Area;</li> <li>• 12 locations adjacent to the Amendment Application Area (to the southwest);</li> <li>• one location within Karijini National Park; and</li> <li>• 22 other locations outside of the Application Area.</li> </ul>	<b>Low</b> The clearing of any of the records of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>1. This species has a large range (distributed across four bioregions);</li> <li>2. This species is widely distributed within the southeast Pilbara (west of Newman); and</li> <li>3. This species is known from within Karijini National Park.</li> </ol>
<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794)	<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) is a shrub or scrambler species growing to a height of 2 to 4 m. Fruit grows in small red drupelets (DPaW and Rio Tinto, 2015).	<i>Rhagodia</i> sp. Hamersley (M. Trudgen 17794) occurs in orange to red loam soils on flood plains. The current known distribution is restricted to the Pilbara IBRA region with increasing numbers of populations recorded in recent years between Tom Price and Newman. This species has been recorded from: <ul style="list-style-type: none"> <li>• eight locations within the Amendment Application Area;</li> <li>• 50 locations adjacent to the Amendment Application Area (to the southeast);</li> <li>• one location within Karijini National Park; and</li> <li>• more than 1,200 locations across the broader region outside of the Amendment Application Area.</li> </ul>	<b>Low</b> The clearing of any of the records of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>1. This species has been recorded in large numbers across the broader southern Pilbara region outside of the Amendment Application Area;</li> <li>2. This species is known from within Karijini National Park.</li> </ol>
<i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739)	<i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739) is a diffuse, loose sprawling, rather than rounded perennial hummock grass to 1.5 m wide to 0.4 m in height, which flowers between May and August (DPaW and Rio Tinto, 2015).	<i>Triodia</i> sp. Mt Ella (M.E. Trudgen 12739) occurs amongst rocks and outcrops on hill slopes and gullies on light orange brown pebbly loam (Onshore Environmental, 2015). It has been recorded from the Gascoyne, Little Sandy Desert and Pilbara bioregions (WAH, 2016) and is considered to be geographically restricted and uncommon, but unlikely to be rare (Trudgen, 1998 in Onshore Environmental, 2015). This species has been recorded from: <ul style="list-style-type: none"> <li>• Seven locations within the Amendment Application Area;</li> <li>• 20 locations adjacent to the Amendment Application Area (to the west and southwest);</li> <li>• six locations within Karijini National Park;</li> <li>• one location within Karlamilyi National Park; and</li> <li>• more than 350 other locations across the southern Pilbara and northern Gascoyne regions.</li> </ul>	<b>Low</b> The clearing of any of the records of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>1. This species has been recorded in large numbers across the broader southern Pilbara region outside of the Amendment Application Area;</li> <li>2. This species is known from within Karijini National Park.</li> </ol>
<b>Priority 4 (DPaW)</b>			
<i>Lepidium catapycnon</i>	<i>Lepidium catapycnon</i> is an open, woody perennial herb / shrub growing between 0.2 to 0.3 m high with distinctive zigzag stems with white flowers in October (DPaW and Rio Tinto, 2015).	<i>Lepidium catapycnon</i> occurs on skeletal soils in open woodland in usually hilly areas, more frequently on south facing slopes (DPaW and Rio Tinto, 2015) in the southern Pilbara (WAH, 2016). <i>Lepidium catapycnon</i> has been identified as a pioneer species that responds rapidly to disturbance, especially fire (Onshore Environmental, 2013). The majority of known populations of this species have been recorded in areas that were recently burnt. This species has been recorded from: <ul style="list-style-type: none"> <li>• 144 locations within the Application Area;</li> <li>• 544 locations adjacent to the Amendment Application Area (to the west and southwest);</li> <li>• 45 locations within Karijini National Park; and</li> <li>• Over 400 other locations across the southern Pilbara.</li> </ul>	<b>Low</b> The clearing of any of the records of this species (if required) within the Application Area would not result in any significant impact upon species distribution as: <ol style="list-style-type: none"> <li>1. This species has been recorded broadly across the southern Pilbara outside of the Application Area.</li> <li>2. This species is known from within Karijini National Park; and</li> <li>3. This species is a disturbance opportunist.</li> </ol>

**3.4.3 Weeds**

Ten introduced flora species (weeds) have been recorded within the Amendment Application Area (Table 5). Control of established weed populations will be carried out according to BHP’s standard *Weed Control and Management Procedures*.

**Table 5 Introduced Flora of the Amendment Application Area**

Species	Common Name	DPAW Rating (DPAW, 2016)	Declared Pest <sup>1</sup>
* <i>Bidens bipinnata</i>	Bipinnate Beggartick	Unknown and Rapid	No
* <i>Cenchrus ciliaris</i>	Buffel Grass	High and Rapid	No
* <i>Cenchrus setiger</i>	Birdwood Grass	High and Rapid	No
* <i>Euphorbia hirta</i>	Asthma Plant	Low and Slow	No
* <i>Flaveria trinervia</i>	Speedy weed	Unknown	No
* <i>Lactuca serriola</i>	Prickly Lettuce	Unknown	No
* <i>Malvastrum americanum</i>	Spiked Malvastrum	High and Rapid	No
* <i>Setaria verticillata</i>	Whorled Pigeon Grass	High and Rapid	No
* <i>Sonchus oleraceus</i>	Common Sowthistle	Low and Rapid	No
* <i>Vachellia farnesiana</i>	Mimosa Bush	High and Rapid	No

**3.4.4 Fauna Habitats and Significant Fauna**

Biologic (2024b) identified the following nine vertebrate fauna habitats within the Amendment Application Area (Figure 4):

- **Calcrete Plain:** The Calcrete Plain fauna habitat includes areas where some solid sheets of calcrete were present, but more commonly soils in this habitat were shallow red loams with calcrete rubble. The vegetation occurring differs from that of the surroundings, presumably due to the differences in soil type. Trees are isolated and the shrub layer tends to be sparse, with a low hummock grassland (*Triodia* sp.) dominant.
- **Stony Plain:** Comprises low-lying open plains and the rolling hills below upland areas, with very slight to no gradient. The substrate consists of gravel and pebbles, with vegetation dominated by *Triodia* and scattered Mulga, eucalypt and *Acacia* trees, with patches of various small to medium shrub species
- **Hillcrest/ Hillslope:** Comprises a rocky substrate, often with exposed bedrock, on moderate to steep slopes leading into lower footslopes. This habitat was characterised by steep slopes with a high proportion of coarse fragments dominated by ironstone. These can contain cracks and crevices. Instances of Gorge/ Gully is contained within this habitat. This habitat is usually dominated by open *Eucalyptus* woodlands, *Acacia* and *Grevillea* scrublands and *Triodia* low hummock grasslands.
- **Breakaway/ Cliff:** Comprises single sided rock faces within steep mid-upper slopes with bare rock outcrops or cliffs (not the entire slope).
- **Gorge/ Gully:** Characterised by rugged, steep-sided valleys incised into the surrounding landscape. Gorges are deeply incised with vertical cliff faces, while gullies are more open (but not as open as Minor Drainage Lines). Caves and rock pools are most often encountered in this habitat type. Vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred.
- **Drainage Area/ Floodplain:** Lower lying plain often subjected to sheet flow following large rainfall events. Vegetation and substrates of this habitat was variable, often comprising scattered *Eucalyptus* over *Acacia* and/or *Grevillea* shrubs with an understory dominated by *Triodia* hummock grasses and/or mixed tussock grasses on alluvial substrates, often with heavy clays and gravel. Tussock grasses can be dominant within Drainage Area/ Floodplain habitat as a result of high rainfall events.
- **Minor Drainage Line:** Usually lacks a tall dense upper storey, but with a dense mid storey, including sparse *Eucalyptus* sp., and *Acacia* sp. over tussock grasses and *Triodia* sp. hummock grasses.

<sup>1</sup> Biosecurity and Agriculture Management Act, 2007 (BAM Act) s22

- **Major Drainage Line:** Comprises scattered *Eucalyptus* and *Acacias*, or mulga woodland, with an understory dominated by tussock grasses. The structure and condition of vegetation often varies seasonally, particularly following rainfall events. Vegetation condition often subject to heavy cattle grazing. This habitat type is prone to pooling and ponding in areas. Also supports the Weeli Wolli PEC, which has groundwater dependent vegetation species including silver cadjeput (*Melaleuca argentea*).
- **Mulga Woodland:** Comprises stands of mulga (*Acacia aneura*) over clay or stony substrates. Differs from other plains by having a monoculture of mulga compared to a diversity of other *Acacia* species.

The surveys undertaken across the Amendment Application Area have resulted in two fauna species of significance being recorded from within the Amendment Application Area (**Figure 5**):

- *Liasis olivaceus* subsp. *barroni* (Pilbara Olive Python) (EPBC Act and BC Act Vulnerable); and
- *Pseudomys chapmani* (Western Pebble-mound Mouse) (DBCAs Priority 4).

One fauna species has been recorded from solely from habitat features which have been excluded from the Amendment Application Area. Given the proximity of the habitat features and the highly mobile nature of these species they are considered to be recorded within the Amendment Application Area:

- *Macroderma gigas* (Ghost Bat) (EPBC Act and BC Act Vulnerable).

Based on the occurrence of the habitat types and significant fauna species previously recorded in the vicinity an additional seven species are considered to potentially occur within the Amendment Application Area (i.e. those considered 'likely' or 'possible' to occur within the Amendment Application Area):

- *Anilius ganei* (Pilbara Flat-headed Blind-snake) (DBCAs Priority 1);
- *Apus pacificus* (Fork-tailed Swift) (EPBC Act and BC Act Migratory);
- *Dasyercus blythi* (Brush-tailed Mulgara) (DBCAs Priority 4);
- *Dasyurus hallucatus* (Northern Quoll) (EPBC Act and BC Act Endangered);
- *Falco hypoleucos* (Grey Falcon) (Vulnerable, EPBC Act; Vulnerable, BC Act);
- *Falco peregrinus* (Peregrine Falcon) ('Other Specially Protected Fauna' BC Act); and
- *Rhinonicteris aurantia* (Pilbara Leaf-nosed Bat) (EPBC Act and BC Act Vulnerable).

An assessment of the potential impact of the proposed clearing on the species of significant fauna that may occur in the application amendment area is provided in **Table 6**.

**Table 6 Significant Fauna Potentially Occurring within the Amendment Application Area**

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
<b>Birds</b>					
Fork-tailed Swift ( <i>Apus pacificus</i> )	Migratory (EPBC Act) Schedule 5 (BC Act)	The Fork-tailed Swift breeds in north-east and east Asia, wintering in Australia and southern New Guinea (Johnstone and Storr, 1998). Fork-tailed Swifts are entirely aerial within the Pilbara and may forage sporadically over the Amendment Application Area in the summer months, associated with thunderstorms and cyclonic systems (Johnstone and Storr, 1998).	The Fork-tailed Swift is largely an aerial species and has a broad distribution across much of Western Australia. It is viewed as a nomadic species and may fly over the Amendment Application Area.	Recorded	<b>Negligible</b> As this species is entirely aerial and not reliant on terrestrial habitats, the impact to this species is considered to be negligible.
Grey Falcon ( <i>Falco hypoleucos</i> )	Vulnerable (EPBC Act) Vulnerable (BC Act)	The Grey Falcon occurs at low densities across inland Australia. This species frequents timbered lowlands, particularly Acacia shrublands that are crossed by tree-lined drainage systems (Threatened Species Scientific Committee, 2020). The species also frequents spinifex and tussock grassland.	This species has not been recorded however possible nesting habitat occurs for this species in the large trees found in the Minor and Major Drainage Line habitat of the Amendment Application Area.  This species may also forage within the drainage line and other broader habitats of the Amendment Application Area	Possible	<b>Low</b> The proposed clearing activities will have negligible impact on the Grey Falcon as: <ul style="list-style-type: none"> <li>This species has not been recorded in the Amendment Application Area;</li> <li>Disturbance within the Minor and Major Drainage Line habitat (potential nesting habitat) will be minimised;</li> <li>Its key habitats occur extensively throughout the Pilbara; and</li> <li>this species ability to egress from the area.</li> </ul>
Peregrine Falcon ( <i>Falco peregrinus</i> )	Other Specially Protected Fauna (BC Act)	The Peregrine Falcon is uncommon but wide ranging across Australia. They occur mainly along coastal cliffs, rivers and ranges as well as wooded watercourses and lakes. The Peregrine Falcon nests primarily on cliffs, granite outcrops and quarries, and feed mostly on birds (Johnstone and Storr 1998).	There are no suitable breeding sites in the Amendment Application Area for this species. Although it may forage in this area as part of a wider home range.	Possible	<b>Low</b> The proposed clearing activities are unlikely to impact on the Peregrine Falcon as it has the ability to egress from areas being disturbed. More suitable habitat for this species occurs outside of the Amendment Application Area.
<b>Mammals</b>					
Brush-tailed Mulgara ( <i>Dasyercus blythi</i> )	Priority 4 (DBCA) (only Brush-tailed Mulgara)	Brush-tailed mulgaras occur in a range of vegetation types, however, the principal habitat is mature hummock grasslands of spinifex, especially <i>Triodia basedowii</i> and <i>T. pungens</i> (Masters <i>et al.</i> , 2003). Note: Woolley, <i>et al.</i> (2013) noted that the Crest-tailed Mulgara ( <i>Dasyercus cristicauda</i> ) is unlikely to occur within the Pilbara.	The preferred habitat for this species (Sandplain habitat) is missing from the Amendment Application Area.  The three records of this species were within a sandy area of the of Drainage Area/ Floodplain habitat and the species may occur as a resident in small sections.  The species occurrence within the Amendment Application Area is unlikely to represent an important population (nearest other records are 13 km to the northeast) and the species is not likely to be reliant upon the Study Area, or habitat within, for the long-term persistence of the species at a local or regional scale.	Recorded	<b>Low</b> Three Mulgara have been recorded from the Amendment Application Area.  A small area of preferred habitat (Sandplain habitat) is missing from the Amendment Application Area. There are large areas of Sandplain habitat outside of the Amendment Application Area and in the broader region.  Active Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable.
Ghost Bat ( <i>Macroderma gigas</i> )	Vulnerable (EPBC Act) Vulnerable (BC Act)	Ghost Bats are patchily distributed across most of northern Australia, however the recent contraction in the distribution in central Australia has left the Pilbara population of ghost bats isolated by extensive sandy deserts (Worthington-Wilmer <i>et al.</i> , 1994). They are generally associated with Gorge / Gully or drainage line habitats, requiring an undisturbed cave, deep fissure or disused mine shaft in which to roost. The Ghost Bat forages in areas of open woodland (Churchill, 2008).	The 14 suitable caves for this species have been clipped from the Amendment Application Area with a 100 m buffer.  This species may forage over the Drainage Area/ Floodplain, Stony Plain, Gorge/ Gully, Minor Drainage Line and Major Drainage Line habitats of the Amendment Application Area as part of a larger home range.	Recorded	<b>Low</b> All suitable caves have been clipped from the Amendment Application Area.  This species is likely to forage over the habitats within the Amendment Application Area and surrounds, however given the nature of the proposed activities the Ghost Bat is unlikely to be impacted from proposed activities.
Northern Quoll ( <i>Dasyurus hallucatus</i> )	Endangered (EPBC Act) Endangered (BC Act)	Northern Quoll populations occur in six geographical centres around Australia, including: Drummond Range, central Queensland; the wet tropics of Northern Queensland; northern Cape York Peninsula; northern and western Top End, Northern Territory; north Kimberley and the Pilbara, Western Australia (Braithwaite and Griffiths, 1994).  Northern Quoll denning habitat in the Pilbara is associated with rocky habitats or riverine habitats with mature Eucalypt trees with hollows (SEWPaC, 2011).	There are three records of the Northern Quoll in the Amendment Application Area.  The Gorge/ Gully, Breakaway/ Cliff and Major Drainage Line habitats provide key foraging and dispersal habitat for the species.  Based on the overall scarcity and concentration of records, the species is unlikely to be reliant on the habitats within the Amendment Application Area for long-term persistence at a local and/or regional scale. based on the results of the current survey.  Based on the results of the Biologic (2024b) survey, the occurrence of northern quoll within the Amendment Application Area is unlikely to be representative of an important population.	Recorded	<b>Low</b> The proposed clearing activities will have negligible impact on the Northern Quoll as: <ul style="list-style-type: none"> <li>The records of this species are not considered to be representative of an important population; and</li> <li>Disturbance within the Gorge/ Gully, Breakaway/ Cliff and Major Drainage Line habitats will be minimised.</li> <li>the proposed area for clearing is small in a regional context.</li> </ul>
Pilbara Leaf-nosed Bat ( <i>Rhinioncteris aurantius</i> )	Vulnerable (EPBC Act) Vulnerable (BC Act)	The Pilbara Leaf-nosed Bat requires deep caves or disused mine shafts in which to roost (van Dyck and Strahan, 2008), at least in the dry season. These bats have been recorded in isolated populations in the Pilbara, and are present only where suitable roosting niches are available. They are generally sparsely distributed. The Pilbara Leaf-nosed Bat forages in areas of open woodland (Churchill, 2008).	While all known potential bat caves have been clipped from the Amendment Application Area, none of these caves are considered suitable as a permanent or semi-permanent roosts for the Pilbara Leaf-nosed Bat.  This species may forage over parts of the Amendment Application Area sporadically as part of a larger home range.	Recorded	<b>Low</b> This species may forage over the habitats within the Amendment Application Area and surrounds.  No suitable roosting habitat has been identified within the Amendment Application Area and therefore the Pilbara Leaf-nosed Bat would not be dependant on the habitats present within the Amendment Application Area and are therefore unlikely to be impacted from proposed activities.



Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Western Pebble-mound mouse ( <i>Pseudomys chapmani</i> )	Priority 4 (DBCA)	The Western Pebble-mound Mouse is restricted to the Pilbara region, where it is recognised as an endemic species. Abandoned mounds to the east of its current range indicate a decline in distribution (Menkhorst and Knight, 2004). Abandoned mounds in disturbed areas suggest that the species is under threat by grazing and mining activities. The construction of extensive pebble mounds, built from small stones, which typically cover areas from 0.5-9.0 square metres, is characteristic of this species. Mounds are restricted to suitable class stones, and are usually found on gentle slopes and spurs (van Dyck and Strahan, 2008).	This species is common in the Hill Crest / Hill Slope habitat of the local and regional area. There are 200 records of this species within the Amendment Application Area.	Recorded	<b>Low</b> This species was recorded and typically occurs within the Hill Crest / Hill Slope habitats within the Amendment Application Area. While the Hill Crest / Hill Slope is utilised by the Western Pebble-mound Mouse, the proposed area for clearing is small in a regional context and is contiguous with habitats in the local and regional area. Active Pebble-mound mounds will be avoided using a 10 m buffer, where practicable.
<b>Reptiles</b>					
Pilbara Flat-headed Blind Snake ( <i>Anilius ganei</i> )	Priority 1 (DBCA)	The Pilbara Flat-headed Blind Snake is a moderately robust blind snake known from widely separated areas between Newman and Pannawonica. A very cryptic species. Most often recorded in rocky or stony areas and considered to be possibly associated with moist gorges and gullies (Wilson and Swan, 2010)	There are two records of this species (one inside a area excluded from the permit) both in Hill Crest / Hill Slope adjacent to Gorge / Gully habitat. The broader Hill Crest / Hill Slope habitats of the Amendment Application Area may also provide suitable habitat for this species, so it may disperse and forage through the Amendment Application Area.	Recorded	<b>Low</b> It is possible that the grading of access tracks and drill pads may result in a localised impact on this species' habitat. Any potential impact is likely to be moderated by the minimal disturbance associated with the clearing activities, and extensive undisturbed areas. Given the regional distribution of Pilbara Flat-headed Blind Snake, the loss of some habitat from the proposed clearing associated with the Amendment Application Area is considered as being low when compared to the expansive areas of suitable habitat remaining and throughout in the Pilbara.
Pilbara Olive Python ( <i>Liasis olivaceus barroni</i> )	Vulnerable (EPBC Act) Vulnerable (BC Act)	The Pilbara Olive Python's range is restricted to the Pilbara region, north Western Australia and the Dampier Archipelago. Habitat consists of rocky escarpments, gorges and waterholes within the Pilbara Region. The preferred microhabitat for this species are under rock piles, on top of rocks and under spinifex as well as in artificial features such as overburden heaps, railway embankments and sewerage treatment ponds. The species' breeding season occurs from June to August, with males moving long distances in search of breeding females (Wilson and Swan, 2017).	There are three records of this species. All known waterholes have been clipped from the Amendment Application Area. This includes two of the three known records. This species may utilise the Drainage Area/ Floodplain, Stony Plain, Gorge/ Gully, Minor Drainage Line and Major Drainage Line habitats of the Amendment Application Area in a transitory nature when conditions are suitable.	Recorded	<b>Low</b> The impact upon this species is likely to be low as <ul style="list-style-type: none"> <li>• Key habitat features (waterholes) have been clipped from the Amendment Application Area.</li> <li>• Disturbance within the Minor and Major Drainage Line habitat (will be minimised);</li> <li>• There are larger areas of suitable habitat in a similar or better condition adjacent to the Amendment Application Area and in the wider area.</li> </ul>

### **3.5 GROUNDWATER**

The Amendment Application Area is located in the Pilbara Groundwater Area, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (DoW, 2009a).

There are two main aquifers within the Amendment Application Area:

Hamersley – Fractured Rock Aquifer which is described as: “The Precambrian rocks of the Hamersley Basin are principally volcanics, shales and iron formations. Groundwater is contained within fractures within these rocks. The groundwater level may be deep below the surface, and is generally fresh. The main use of this aquifer is for mining and mine dewatering from iron ore mines. Bores have also been drilled for road and railway construction. There will be increasing dewatering from the fractured rocks around iron ore mines as the pits become deeper (DoW, 2015)”.

Hamersley – Wittenoom Aquifer: The Wittenoom aquifer is distinguished as a separate aquifer system because the Wittenoom Dolomite is distinct from the other fractured rock aquifers in the Hamersley Basin, having karst development (solution cavities) and being overlain by a thick sequence of valley filled sediments consisting of pisolite, calcrete and alluvium. The Wittenoom Dolomite is the most important aquifer in the province and underlies the main valleys in the Hamersley Range; it is highly transmissive and high yielding where there is karst development. Water levels may be fairly deep. The groundwater is generally fresh. The aquifer has been developed for Tom Price and Marandoo water supply and has been investigated at other localities. There is likely to be significant development pressure on this aquifer for supply to iron ore operations (DoW, 2015b)

### **3.6 SURFACE WATER**

The Amendment Application Area is situated in the Pilbara Surface Water Area, proclaimed under the RIWI Act (DoW, 2009b).

There are multiple non-perennial drainage lines that flow predominately to the northwest across the Amendment Application Area before joining Weeli Wolli Creek located approximately 3 km from the Amendment Application Area.

Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.

## **4 ENVIRONMENTAL MANAGEMENT**

The management of the environmental aspects of BHP’s operations at the Amendment Application Area are managed under the company’s AS/NZS ISO 14001:2004 certified Environmental Management System (EMS). The EMS describes the organisational structure, responsibilities, practices, processes and resources for implementing and maintaining environmental objectives at all BHP sites

Additionally, operational controls for environmental management for the Project area are guided by BHP’s Charter values. The Charter Values outline a commitment to develop, implement and maintain management systems for sustainable development that drive continual improvement and set and achieve targets that promote efficient use of resources. In order to give effect to the Charter Values, a series of Our Requirements Documents have been developed.

BHP has also developed a Sustainable Development Policy for its operations. The Sustainable Development Policy outlines a commitment to setting objective and targets to achieve sustainable outcomes and to continually improve our performance.

BHP also has an internal Project Environmental and Aboriginal Heritage Review (PEAHR) Procedure. The purpose of the procedure is to manage implementation of environmental, Aboriginal heritage, land tenure and legal commitments prior to and during land disturbance. All ground disturbance activities will meet the requirements of the PEAHR procedure, all relevant legislative and regulatory requirements, the BHP Charter, industry standards, and codes of practice.

All personnel carrying out works associated with clearing activities are required to comply with BHP’s Charter Values, BHP’s Our Requirements, and relevant legislative and licensing requirements.

**5 PROJECT COMPLIANCE WITH THE TEN CLEARING PRINCIPLES**

BHP considers that native vegetation clearing within the Amendment Application Area will not result in any significant environmental or social impacts, and complies with the Ten Clearing Principles, as defined in Schedule 5 of the EP Act. **Section 6** provides an assessment of project compliance with the Ten Clearing Principles.

## **6 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES**

The information used to assess the application against the Ten Clearing Principles has been based on the findings of multiple baseline surveys (**Section 3**).

### **6.1 PRINCIPLE A**

***Native vegetation should not be cleared if it comprises a high level of biological diversity***

This proposal is not likely to be at variance to this Principle.

Similar habitat to the Amendment Application Area is located outside the Amendment Application Area. These other areas of similar vegetation type are therefore expected to have a similar biological diversity and conservation value than that of the Amendment Application Area.

The proposed clearing is therefore unlikely to have any significant impact on the biodiversity of the region.

**Table 7** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle A.

**Table 7 Assessment against Principle A components**

Principle	Criteria	Assessment	Outcome
<p>a) Native vegetation should not be cleared if it comprises a high level of biological diversity.</p>	<p>a1) Native vegetation should not be cleared if it is representative of an area of outstanding biodiversity in the Bioregion.</p>	<p>The native vegetation within the Amendment Application Area is represented in the same condition within the broader region and is not considered to be of outstanding biodiversity in the Bioregion.</p>	<p>Not at variance with clearing principle.</p>
	<p>a2) Native vegetation should not be cleared if it has higher diversity of indigenous aquatic or terrestrial plant or fauna species than native vegetation of that ecological community in good or better condition in the Bioregion.</p>	<p>The native vegetation within the Amendment Application Area is in the same condition as other areas of similar vegetation type within the broader region.</p>	<p>Not at variance with clearing principle.</p>
	<p>a3) Native vegetation should not be cleared if it has higher diversity of indigenous aquatic or terrestrial plant or fauna species than the remaining vegetation of that ecological community in the local area.</p>	<p>The native vegetation within the Amendment Application Area is not considered to have higher biodiversity and conservation value than that of the surrounding vegetation within the local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>a4) Native vegetation should not be cleared if it has higher ecosystem diversity than other native vegetation of that local area.</p>	<p>The native vegetation within the Amendment Application Area is not considered to have a higher ecosystem diversity than other native vegetation of that local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>a5) Native vegetation should not be cleared if it has higher genetic diversity than the remaining native vegetation of that ecological community.</p>	<p>The native vegetation within the Amendment Application Area is not considered to have a higher genetic diversity than the remaining native vegetation of that ecological community as the vegetation is contiguous with adjacent native vegetation and has no special features.</p>	<p>Not at variance with clearing principle.</p>
	<p>A6) Native vegetation should not be cleared if it is necessary for the continued in situ existence of significant habitat for priority flora species published by the Department of Environment and Conservation.</p>	<p>Ten Priority flora species have been recorded in the Amendment Application Area. The records of identified Priority flora populations will be avoided using a 10 m buffer where practicable.</p>	<p>Not at variance with clearing principle.</p>

**6.2 PRINCIPLE B**

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

This proposal is not likely to be at variance to this Principle.

There are nine broad fauna habitat types within the Amendment Application Area (**Figure 3**).

The vegetation and habitat found within the Amendment Application Area are considered to be well represented in the Pilbara bioregions.

Eight fauna species of significance have been recorded from within the Amendment Application Area (or specific exclusion zones) with an additional two species considered to potentially occur within the Amendment Application Area (**Table 6**). As described in **Section 3.4.4** and **Table 6** clearing of the Amendment Application Area is expected to have a low impact on these species.

**Table 8** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle B.

**Table 8 Assessment against Principle B components**

Principle	Criteria	Assessment	Outcome
<p>b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.</p>	<p>b1) Native vegetation should not be cleared if it is or is likely to be habitat for fauna that is declared Specially Protected under the BC Act.</p>	<p>Five BC Act protected species have been recorded from the Amendment Application (or specific exclusion zones) and two BC Act protected species are considered 'possible' or 'likely' to occur within the Amendment Application Area (<b>Table 6</b>). The proposed activities are unlikely to have a significant impact on these species as:</p> <ul style="list-style-type: none"> <li>• All species are wide-ranging and found throughout the broader region;</li> <li>• There are no key habitat features (caves and waterhole habitats) within the Amendment Application Area;</li> <li>• All species are only likely to forage within the Amendment Application Area;</li> <li>• These species do not exclusively depend on any habitat type or feature within the Amendment Application Area; and</li> <li>• Similar habitat is well represented outside the Amendment Application Area.</li> </ul>	<p>Unlikely to be at variance with clearing principle.</p>
	<p>b2) Native vegetation should not be cleared if it is or is likely to be habitat for Priority Listed Fauna.</p>	<p>Three Priority fauna species have been recorded within the Amendment Application Area with no others considered 'possible' or 'likely' to occur within the Amendment Application Area. As detailed in <b>Table 6</b> these species are unlikely to be impacted for the following reasons:</p> <ul style="list-style-type: none"> <li>• The preferred habitat for these species is well represented outside the Amendment Application Area;</li> <li>• Similar habitat within close vicinity to the Amendment Application Area was found to be the same or better condition than that of the Amendment Application Area;</li> <li>• Active Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable; and</li> <li>• Active mounds of the Western Pebble-mound Mouse will be avoided using a 10 m buffer, where practicable.</li> </ul>	<p>Not at variance with clearing principle.</p>
	<p>b3) Native vegetation should not be cleared if it is or is likely to be habitat for fauna that is otherwise significant.</p>	<p>Habitat found within the Amendment Application Area may be suitable for use by conservation significant fauna, however similar habitat in the same or better condition is widespread in the Amendment Application Area surrounds</p>	<p>Not at variance with clearing principle.</p>
	<p>b4) Native vegetation should not be cleared if it provides significant habitat for fauna species in the local area.</p>	<p>Habitat within the Amendment Application Area is not considered significant habitat for fauna species within the local area. Similar habitat to that proposed to be cleared is located to the area surrounding of the Amendment Application Area.</p>	<p>Not at variance with clearing principle.</p>
	<p>b5) Native vegetation should not be cleared if it maintains ecological functions and processes that protect significant habitat for fauna.</p>	<p>The clearing of native vegetation is not considered to alter ecological functions and processes that protect significant habitat for fauna.</p>	<p>Not at variance with clearing principle.</p>

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Principle	Criteria	Assessment	Outcome
	b6) Native vegetation should not be cleared if it forms, or is part of, an ecological linkage that is necessary for the maintenance of fauna.	No ecological linkages run through the Amendment Application Area that are necessary for the maintenance of fauna.	Not at variance with clearing principle.
	b7) Native vegetation should not be cleared if it provides significant habitat for fauna communities (assemblages) and meta-populations.	The Amendment Application Area is not considered to contain significant habitat for faunal assemblages that are not also present in other areas within the vicinity. The Amendment Application Area is not considered likely to contain geographically isolated fauna populations.	Not at variance with clearing principle.



**6.3 PRINCIPLE C**

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

This proposal is not likely to be at variance to this Principle.

No species listed under the EPBC Act or gazetted as Threatened under the BC Act were recorded in the Amendment Application Area. Three species listed as Priority Flora by the DBCA have been recorded in the Amendment Application Area (**Section 3.4.2**).

**Table 9** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle C.

**Table 9 Assessment against Principle C components**

Principle	Criteria	Assessment	Outcome
c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	c1) Native vegetation should not be cleared if it is necessary for the continued <i>in situ</i> existence of populations of Declared Rare Flora under the <i>BC Act 2016</i>	No Threatened flora species were recorded in the Amendment Application Area.	Not at variance with clearing principle.
	c2) Native vegetation should not be cleared if it is necessary for the continued <i>in situ</i> existence of other significant flora.	No species listed under the EPBC Act or other significant flora species were recorded in the Amendment Application Area.	Not at variance with clearing principle.

**6.4 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***

This proposal is not likely to be at variance to this Principle.

None of the vegetation associations or landforms identified within the boundaries of CPS 4468/3 are associated with a TECs or PECs (Onshore Environmental, 2014). The closest PEC the Weeli Wolli Spring Community (Priority 1) which is approximately 2 km northwest of the Amendment Application Area (**Section 3.4.1**).

The NVCP boundary intersects the buffer of this PEC but there should be no impacts on this PEC based on the proposed activities and the surface water management measures that will be implemented (**Section 3.6**).

**Table 10** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle D.

**Table 10 Assessment against Principle D components**

Principle	Criteria	Assessment	Outcome
<p>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.</p>	<p>d1) Native vegetation should not be cleared if threatened ecological communities listed under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> are present.</p>	<p>No EPBC Act TECs are present in the Amendment Application Area.</p>	<p>Not at variance with clearing principle.</p>
	<p>d2) Native vegetation should not be cleared if it is necessary for the maintenance of Threatened Ecological Communities listed under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>.</p>	<p>No EPBC Act TECs or associated native vegetation will be impacted by the proposed works.</p>	<p>Not at variance with clearing principle.</p>
	<p>d3) Native vegetation should not be cleared if other significant ecological communities are present.</p>	<p>No significant ecological communities are known to occur or are likely to occur within the Amendment Application Area.</p>	<p>Not at variance with clearing principle.</p>
	<p>d4) Native vegetation should not be cleared if it is necessary for the maintenance of other significant ecological communities.</p>	<p>No DBCA listed TECs or associated native vegetation will be impacted by the proposed works.</p>	<p>Not at variance with clearing principle.</p>
	<p>d5) Native vegetation should not be cleared if it is necessary for the continued <i>in situ</i> existence of significant examples of priority threatened ecological communities published by the Department of Environment and Conservation.</p>	<p>No DBCA listed PECs or associated native vegetation will be impacted by the proposed works.</p>	<p>Not at variance with clearing principle.</p>

**6.5 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***

This proposal is not likely to be at variance to this Principle.

The habitat and vegetation within the Amendment Application Area is well represented in the Land Systems of the region (**Section 3.4.1**), and therefore it is unlikely individual species would be restricted to a particular habitat and vegetation occurring in the Amendment Application Area.

**Table 11** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle E.

**Table 11 Assessment against Principle E components**

Principle	Criteria	Assessment	Outcome
<p>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.</p>	<p>e1) Native vegetation should not be cleared if the remaining native vegetation represents less than 30%, or the clearing would reduce the representation of remaining native vegetation to less than 30% in the Bioregion (or subregion where applicable).</p>	<p>Clearing native vegetation within the Amendment Application Area will not reduce the extent of native vegetation below 30% in the bioregion or subregion.</p>	<p>Not at variance with clearing principle.</p>
	<p>e2) Native vegetation should not be cleared if an ecological community represents less than 30% of its original extent or clearing would reduce the representation of any ecological community to less than 30% of its original extent in the Bioregion (or subregion where applicable).</p>	<p>Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the ecological community from pre-European extents.  Current remaining extents of the vegetation communities in the bioregion are almost 100% of pre-European extents.</p>	<p>Not at variance with clearing principle.</p>
	<p>e3) Native vegetation should not be cleared if clearing would reduce an ecological community to less than 1% of the Bioregion (or subregion where applicable)</p>	<p>Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the vegetation community in the bioregion.</p>	<p>Not at variance with clearing principle.</p>
	<p>e4) Native vegetation should not be cleared if the remaining native vegetation represents less than 30% or the clearing would reduce the representation of remaining native vegetation to less than 30% in the Local Area.</p>	<p>Clearing native vegetation within the Amendment Application Area will not reduce the representation of remaining native vegetation to less than 30% in the local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>e5) Native vegetation should not be cleared if an ecological community represents less than 30% of its original extent or clearing will reduce the representation of any ecological community to less than 30% of its original extent in the Local Area.</p>	<p>Clearing native vegetation within the Amendment Application Area will not reduce the representation of any ecological community to less than 30% of its original extent in the local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>e6) Native vegetation should not be cleared if clearing would reduce any ecological community to less than 1% of the Local Area.</p>	<p>Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the vegetation community in the local area.</p>	<p>Not at variance with clearing principle.</p>

**6.6 PRINCIPLE F**

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

This proposal is unlikely to be at variance to this Principle.

There are multiple non-perennial drainage lines that flow predominately to the northwest across the Amendment Application Area before joining Weeli Wollie Creek located approximately 3 km from the Amendment Application Area.

Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.

**Table 12** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle F.

**Table 12 Assessment against Principle F components**

Principle	Criteria	Assessment	Outcome
<p>f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p>	<p>f1) Native vegetation should not be cleared if it is growing in a watercourse or wetland that has been identified as having significant environmental values.</p>	<p>No permanent watercourses or wetlands are located within with the Amendment Application Area.</p> <p>There are multiple non-perennial drainage lines that flow predominately to the northwest across the Amendment Application Area before joining Weeli Wollie Creek located approximately 3 km from the Amendment Application Area.</p> <p>Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow</p>	<p>Not at variance with clearing principle.</p>
	<p>f2) Native vegetation should not be cleared if it provides a buffer area for watercourses and wetlands identified in criteria (f1) and (f2).</p>	<p>No permanent watercourses or wetlands are located within with the Amendment Application Area.</p> <p>There are multiple non-perennial drainage lines that flow predominately to the northwest across the Amendment Application Area before joining Weeli Wollie Creek located approximately 3 km from the Amendment Application Area.</p> <p>Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow</p>	<p>Not at variance with clearing principle.</p>
	<p>f3) Native vegetation should not be cleared if water tables are likely to change and adversely affect ecological communities that are wetland or groundwater dependent.</p>	<p>Due to the small scale of clearing this project is not considered likely to adversely alter water tables, and as such will not impact on any ecological communities that are wetland or groundwater dependent.</p>	<p>Not at variance with clearing principle.</p>
	<p>f4) Native vegetation should not be cleared if it is growing in other watercourses or wetlands.</p>	<p>No permanent watercourses or wetlands are located within with the Amendment Application Area or in association with any other immediate watercourses or wetland in the surrounding area.</p>	<p>Not at variance with clearing principle.</p>



## **6.7 PRINCIPLE G**

### ***Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation***

This proposal is not likely to be at variance to this Principle.

Land degradation may include impacts such as erosion, changes to pH, water logging, salinisation or spread of weeds. These potential impacts are assessed in the sections below. **Table 13** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle G.

Given the relatively small amount of clearing required for the project, the proposed management strategies for weed species within the Amendment Application Area and the low susceptibility of the soils to erosion, it is considered that the project will not be at variance to Principle G.

### **6.7.1 Erosion**

It is not anticipated that the removal of vegetation will contribute to increased amounts of wind or water erosion in the Amendment Application Area or adjacent areas.

### **6.7.2 Changes to pH**

The Amendment Application Area is not in an area at risk of acid sulphate soils and there are no recorded acid sulphate soils within the Amendment Application Area. It is not expected that the proposed clearing will result in changes to soil pH.

### **6.7.3 Water logging and salinisation**

It is not expected that there will be a significant reduction in groundwater uptake due to the proposed clearing. No water logging or increased salinisation is expected to occur as a result of the proposed clearing.

### **6.7.4 Weeds**

Six introduced flora species have been recorded in the Amendment Application Area (**Table 4**). None are listed as a Declared Pest under the BAM Act. These are typical introduced species commonly recorded in the Pilbara region.

Control of established weed populations will be carried out according to the *BHP Weed Control and Management Procedure*.

**Table 13 Assessment against Principle G components**

Principle	Criteria	Assessment	Outcome
<p>g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<p>g1) Native vegetation should not be cleared if wind or water erosion of soil is likely to be increased (on or off site).</p>	<p>Soil erosion is not anticipated to occur as any areas cleared will be revegetated where practicable, if not required for infrastructure.</p>	<p>Not considered to be at variance with clearing principle.</p>
	<p>g2) Native vegetation on land with soils with high or low pH should not be cleared.</p>	<p>The Amendment Application Area is not considered to contain soils at risk of having acid sulphate soils present.  No vegetation on soils with significantly low (or high) pH will be impacted by the proposed works.</p>	<p>Not at variance with clearing principle.</p>
	<p>g3) Native vegetation should not be cleared if water logging is likely to be increased (on or off site).</p>	<p>It is not expected that water logging would be increased by the clearing of native vegetation within the Amendment Application Area.</p>	<p>Not at variance with clearing principle.</p>
	<p>g4) Native vegetation should not be cleared if land salinisation is likely to be increased (on or off site).</p>	<p>Soil salinity is not considered to be increased in the Amendment Application Area (on or off site) by the clearing of native vegetation.</p>	<p>Not at variance with clearing principle.</p>

**6.8 PRINCIPLE H**

***Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area***

This proposal is not likely to be at variance to this Principle.

The Amendment Application Area is not within any conservation areas as listed by the DBCA or those protected under the EPBC Act. The closest conservation area is Karijini National Park which is more than 55 km west of the Amendment Application Area.

The Amendment Application Area is not considered to form an ecological linkage to these conservation areas.

An assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle H is provided in **Table 14** below.

**Table 14 Assessment against Principle H components**

Principle	Criteria	Assessment	Outcome
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.	h1) Native vegetation should not be cleared if it contributes significantly to the environmental values of a conservation area.	The vegetation of the Amendment Application Area does not contribute to the environmental values of a conservation area.	Not at variance with clearing principle.
	h2) Native vegetation should not be cleared if that vegetation provides a buffer to a conservation area.	There are no conservation areas within the vicinity of the Amendment Application Area.	Not at variance with clearing principle.
	h3) Native vegetation should not be cleared if the land contributes to an ecological linkage to a conservation area.	The nearest conservation area is 55 km west of the Amendment Application Area.	Not at variance with clearing principle.
	h4) Native vegetation should not be cleared if it provides habitats not well represented on conservation land.	There are no habitats within the Amendment Application Area that are not well represented on conservation land.	Not at variance with clearing principle.

**6.9 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***

This proposal is not likely to be at variance to this Principle.

Appropriate surface water management practices will be implemented to minimise erosion and minimise potential impacts on the quality of surface water. The clearing is unlikely to cause deterioration in the quality of any surface or underground water.

Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.

**Table 15** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle I.

**Table 15 Assessment against Principle I components**

Principle	Criteria	Assessment	Outcome
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.	i1) Native vegetation should not be cleared if clearing the vegetation will reduce the quality of surface or underground water in proclaimed, gazetted or declared areas or catchments.	The clearing of native vegetation is not considered likely to alter the quality of surface or ground water within the Amendment Application Area due to the limited nature of the clearing within the Amendment Application Area.	Not at variance with clearing principle.
	i2) Native vegetation should not be cleared if sedimentation, erosion, turbidity or eutrophication of water bodies on or off site is likely to be caused or increased.	Localised erosion will not impact any waterbodies as clearing will be restricted to a bare minimum near surface water features and cleared areas that are no longer required will be revegetated.	Not at variance with clearing principle.
	i3) Native vegetation should not be cleared if water tables are likely to change significantly altering salinity or pH.	The clearing of native vegetation is not considered likely to alter the quality of surface or ground water within the Amendment Application Area.	Not at variance with clearing principle.
	i4) Native vegetation should not be cleared if the clearing is likely to alter the water regimes of groundwater-dependent ecosystems on or off site, causing degradation to the biological communities associated with these systems.	The clearing of native vegetation is not considered likely to alter the regimes of surface or groundwater dependent vegetation within the vicinity of the Amendment Application Area.	Not at variance with clearing principle.

**6.10 PRINCIPLE J**

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

This proposal is not likely to be at variance to this Principle.

Massive surface water runoff and localised flooding occurs following intense rainfall events during December to April. However, the incidence or intensity of flooding is not likely to be significantly influenced by the proposed vegetation clearing. It is highly improbable that surface runoff generated from the cleared area could create sufficient concentrated water volumes to cause even a localised flood event. Drainage infrastructure will be designed to ensure that post-construction flows will not differ significantly from pre-construction flows. Therefore the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding.

**Table 16** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle J.

**Table 16 Assessment against Principle J components**

Principle	Criteria	Assessment	Outcome
j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.	j1) Native vegetation should not be cleared if it is likely to lead to an incremental increase in peak flood height.	The clearing of native vegetation is not considered likely to cause any alteration to peak flood height.	Not at variance with clearing principle.
	j2) Native vegetation should not be cleared if it is likely to lead to an incremental increase in duration of flood peak.	The clearing of native vegetation is not considered likely to cause any impact on duration of flood peak.	Not at variance with clearing principle.



## **7 HERITAGE**

The Land Access Unit is the internal group within BHP that manages Aboriginal heritage matters. The Land Access Unit is responsible for ensuring that BHP complies with the *Aboriginal Heritage Act, 1972*, and all other state and federal heritage legislation. All land disturbance activities are subject to ethnographic and archaeological surveys as part of an internal PEHR. The PEHR process ensures that all heritage sites in the vicinity of the Project Area are identified and avoided where practicable.

The Amendment Application Area is located within the Nyiyaparli People Native Title Claim (WC2005/006). Ethnographic and archaeological surveys of the Application Area have been conducted in consultation with the Nyiyaparli people. A number of heritage sites were identified within the Amendment Application Area (site details are not provided here out of respect of the wishes of the Traditional Owners).

If any heritage site cannot practicably be avoided, BHP Iron Ore would consult the relevant traditional owners and seek approval under the *Aboriginal Heritage Act 1972* before the site is disturbed.

## **8 CONCLUSION**

The proposed clearing of up to 750 ha within the proposed 14,787 ha Amendment Application Area is unlikely to have any significant negative impacts on biodiversity and environmental values in the area and is unlikely to be at variance to any of the Ten Clearing Principles.

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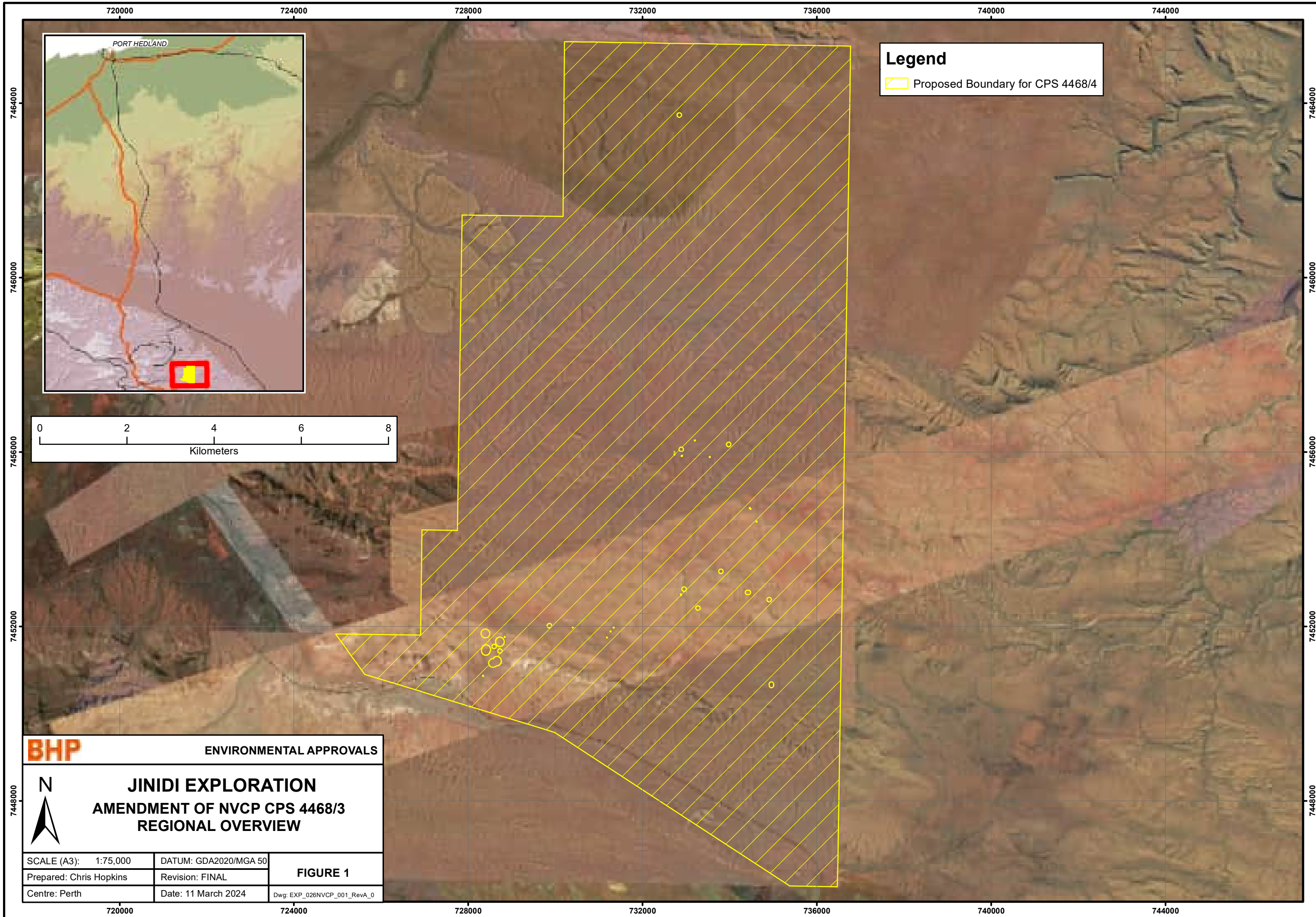
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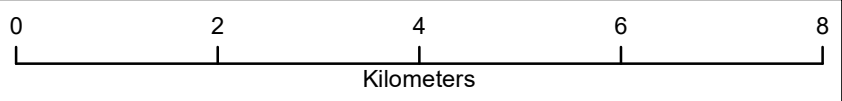
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# Figures



**Legend**  
 Proposed Boundary for CPS 4468/4



<b>BHP</b>		ENVIRONMENTAL APPROVALS	
<b>JINIDI EXPLORATION</b> <b>AMENDMENT OF NVCP CPS 4468/3</b> <b>REGIONAL OVERVIEW</b>			
SCALE (A3): 1:75,000	DATUM: GDA2020/MGA 50	<b>FIGURE 1</b>	
Prepared: Chris Hopkins	Revision: FINAL		
Centre: Perth	Date: 11 March 2024		
		Dwg: EXP_026NVCP_001_RevA_0	



# JINIDI EXPLORATION AMENDMENT OF NVCP CPS 4468/3 VEGETATION ASSOCIATIONS

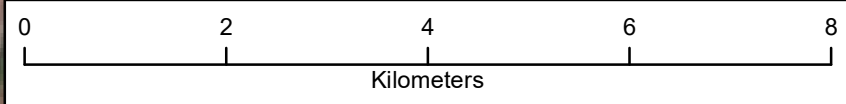
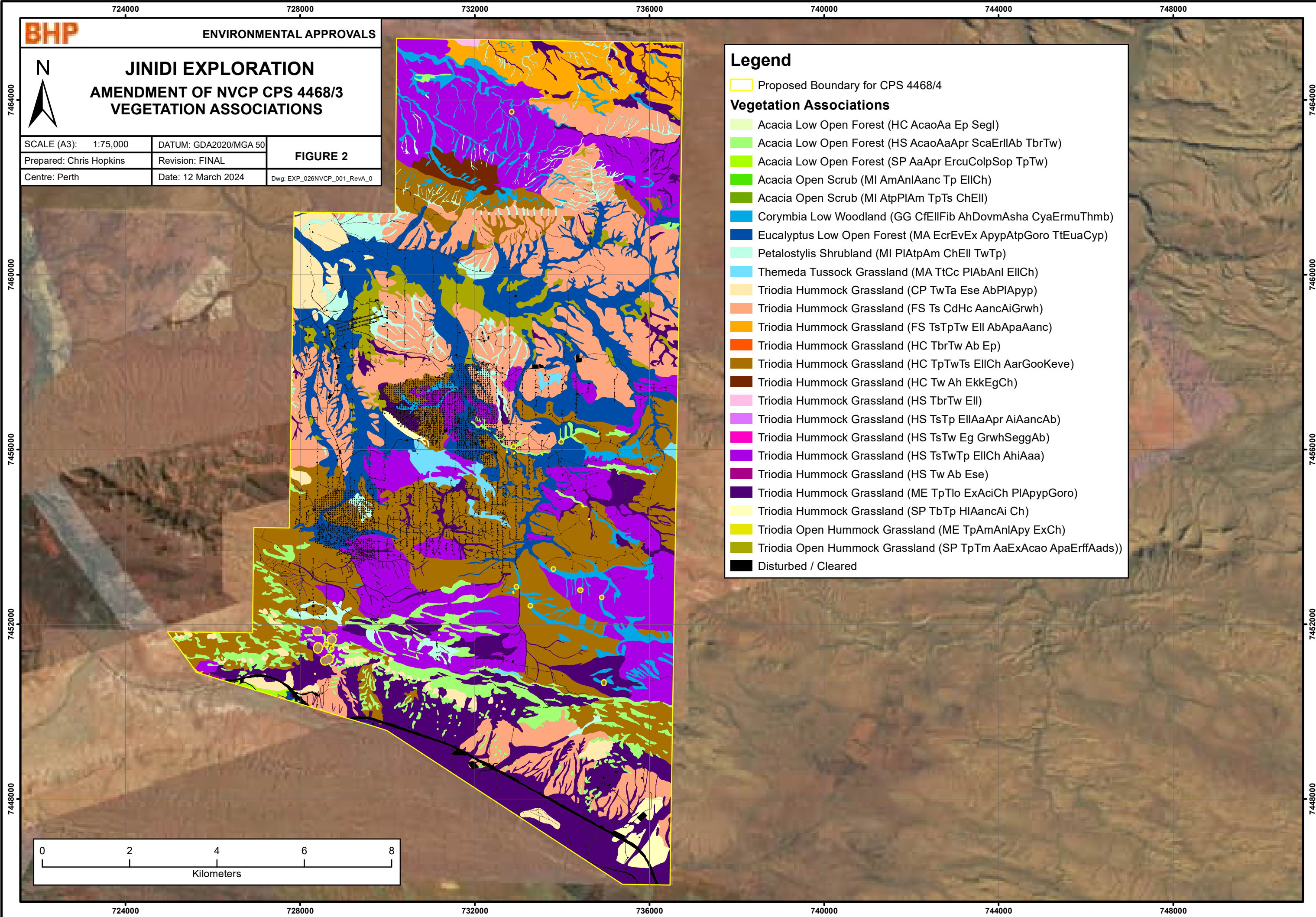
SCALE (A3): 1:75,000	DATUM: GDA2020/MGA 50	<b>FIGURE 2</b>
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 12 March 2024	

## Legend

Proposed Boundary for CPS 4468/4

### Vegetation Associations

- Acacia Low Open Forest (HC AcaoAa Ep Segl)
- Acacia Low Open Forest (HS AcaoAaApr ScaErlIAb TbrTw)
- Acacia Low Open Forest (SP AaApr ErcuColpSop TpTw)
- Acacia Open Scrub (MI AmAnIAanc Tp EllCh)
- Acacia Open Scrub (MI AtpPIAm TpTs ChEll)
- Corymbia Low Woodland (GG CfEllFib AhDovmAsha CyaErnuThmb)
- Eucalyptus Low Open Forest (MA EcrEvEx ApypAtpGoro TtEuaCyp)
- Petalostylis Shrubland (MI PIAtpAm ChEll TwTp)
- Themeda Tussock Grassland (MA TtCc PIAbAnl EllCh)
- Triodia Hummock Grassland (CP TwTa Ese AbPIApy)
- Triodia Hummock Grassland (FS Ts CdHc AancAiGrwh)
- Triodia Hummock Grassland (FS TsTpTw Ell AbApaAanc)
- Triodia Hummock Grassland (HC TbrTw Ab Ep)
- Triodia Hummock Grassland (HC TpTwTs EllCh AarGooKeve)
- Triodia Hummock Grassland (HC Tw Ah EkkEgCh)
- Triodia Hummock Grassland (HS TbrTw Ell)
- Triodia Hummock Grassland (HS TsTp EllAaApr AiAancAb)
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- Triodia Hummock Grassland (HS Tw Ab Ese)
- Triodia Hummock Grassland (ME TpTlo ExAciCh PIAPypGoro)
- Triodia Hummock Grassland (SP TbTp HIAancAi Ch)
- Triodia Open Hummock Grassland (ME TpAmAnIApy ExCh)
- Triodia Open Hummock Grassland (SP TpTm AaExAcao ApaErffAads))
- Disturbed / Cleared





# JINIDI EXPLORATION AMENDMENT OF NVCP CPS 4468/3 VEGETATION ASSOCIATIONS

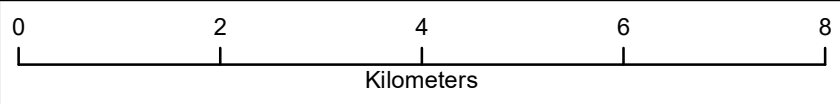
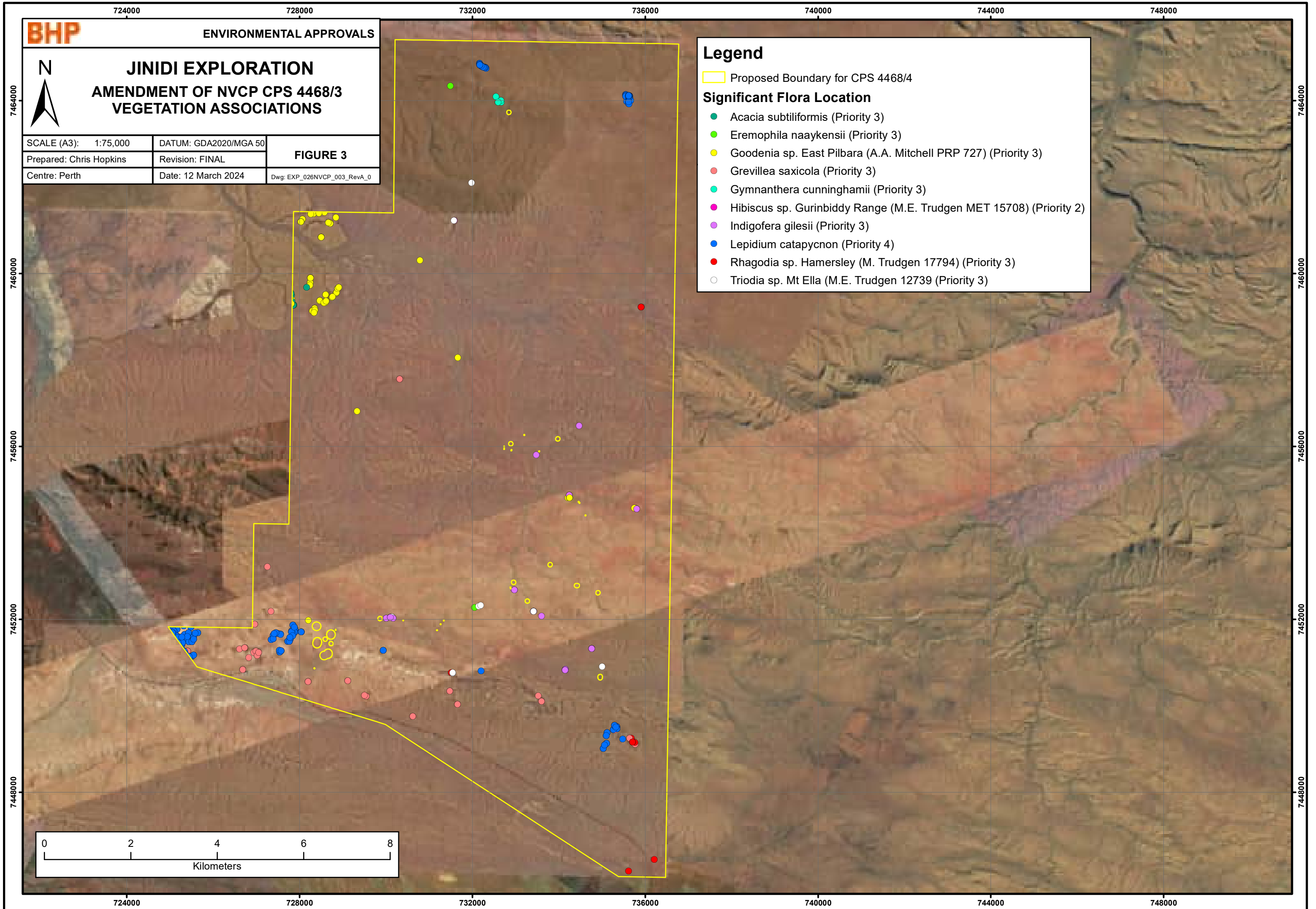
SCALE (A3): 1:75,000	DATUM: GDA2020/MGA 50	<b>FIGURE 3</b>
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 12 March 2024	

### Legend

Proposed Boundary for CPS 4468/4

#### Significant Flora Location

- Acacia subtiliformis* (Priority 3)
- Eremophila naaykensis* (Priority 3)
- Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (Priority 3)
- Grevillea saxicola* (Priority 3)
- Gymnanthera cunninghamii* (Priority 3)
- Hibiscus* sp. Gurinbiddy Range (M.E. Trudgen MET 15708) (Priority 2)
- Indigofera gilesii* (Priority 3)
- Lepidium catapycnon* (Priority 4)
- Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3)
- Triodia* sp. Mt Ella (M.E. Trudgen 12739) (Priority 3)





ENVIRONMENTAL APPROVALS



# JINIDI EXPLORATION AMENDMENT OF NVCP CPS 4468/3 VERTEBRATE FAUNA HABITAT

SCALE (A3): 1:75,000

DATUM: GDA2020/MGA 50

FIGURE 4

Prepared: Chris Hopkins

Revision: FINAL

Centre: Perth

Date: 12 March 2024

Dwg: EXP\_026NVCP\_004\_RevA\_0

## Legend

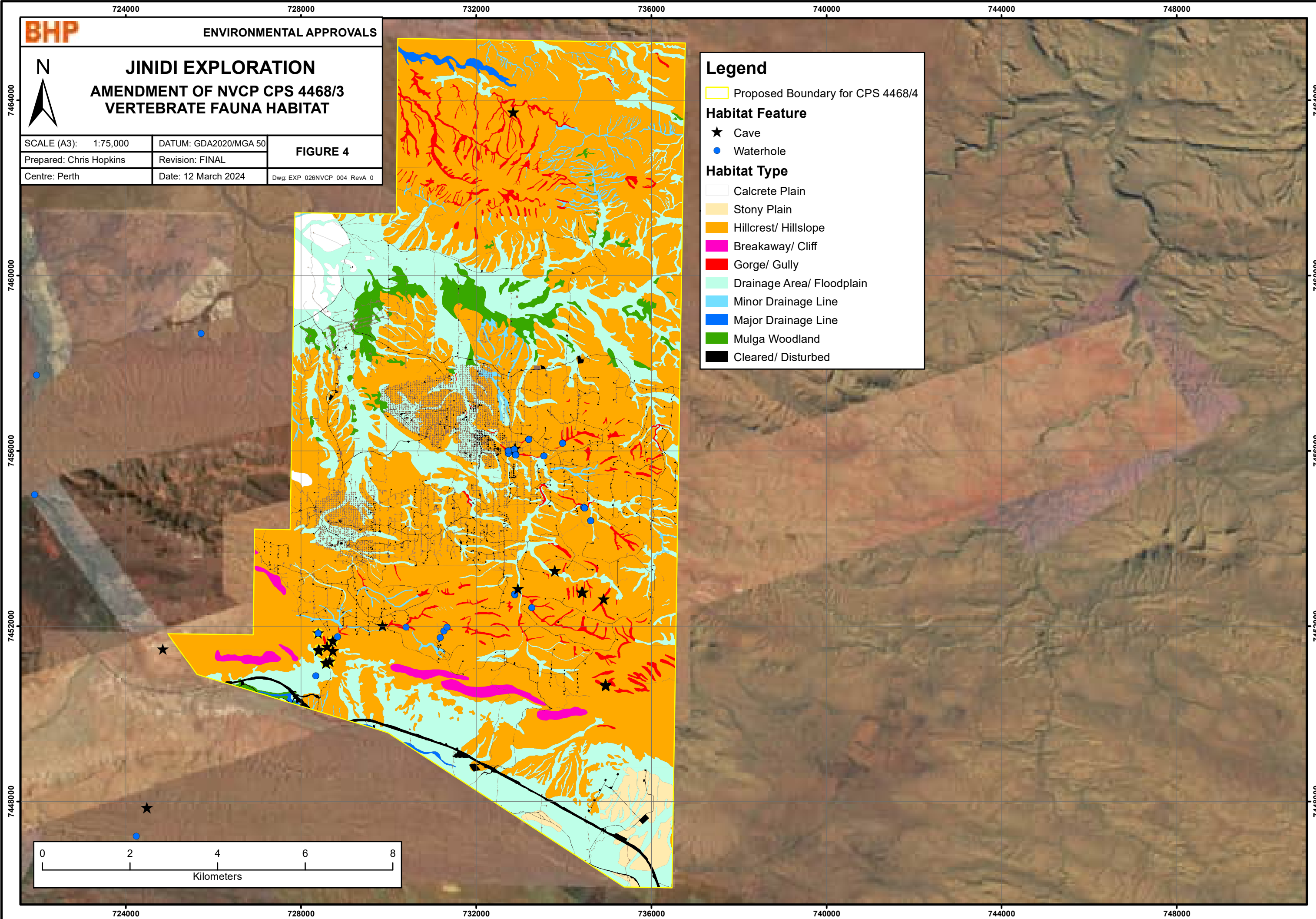
Proposed Boundary for CPS 4468/4

### Habitat Feature

- ★ Cave
- Waterhole

### Habitat Type

- Calcrete Plain
- Stony Plain
- Hillcrest/ Hillslope
- Breakaway/ Cliff
- Gorge/ Gully
- Drainage Area/ Floodplain
- Minor Drainage Line
- Major Drainage Line
- Mulga Woodland
- Cleared/ Disturbed







# JINIDI EXPLORATION AMENDMENT OF NVCP CPS 4468/3 SIGNIFICANT VERTEBRATE FAUNA

SCALE (A3): 1:75,000	DATUM: GDA2020/MGA 50	<b>FIGURE 5</b>
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 13 March 2024	

### Legend

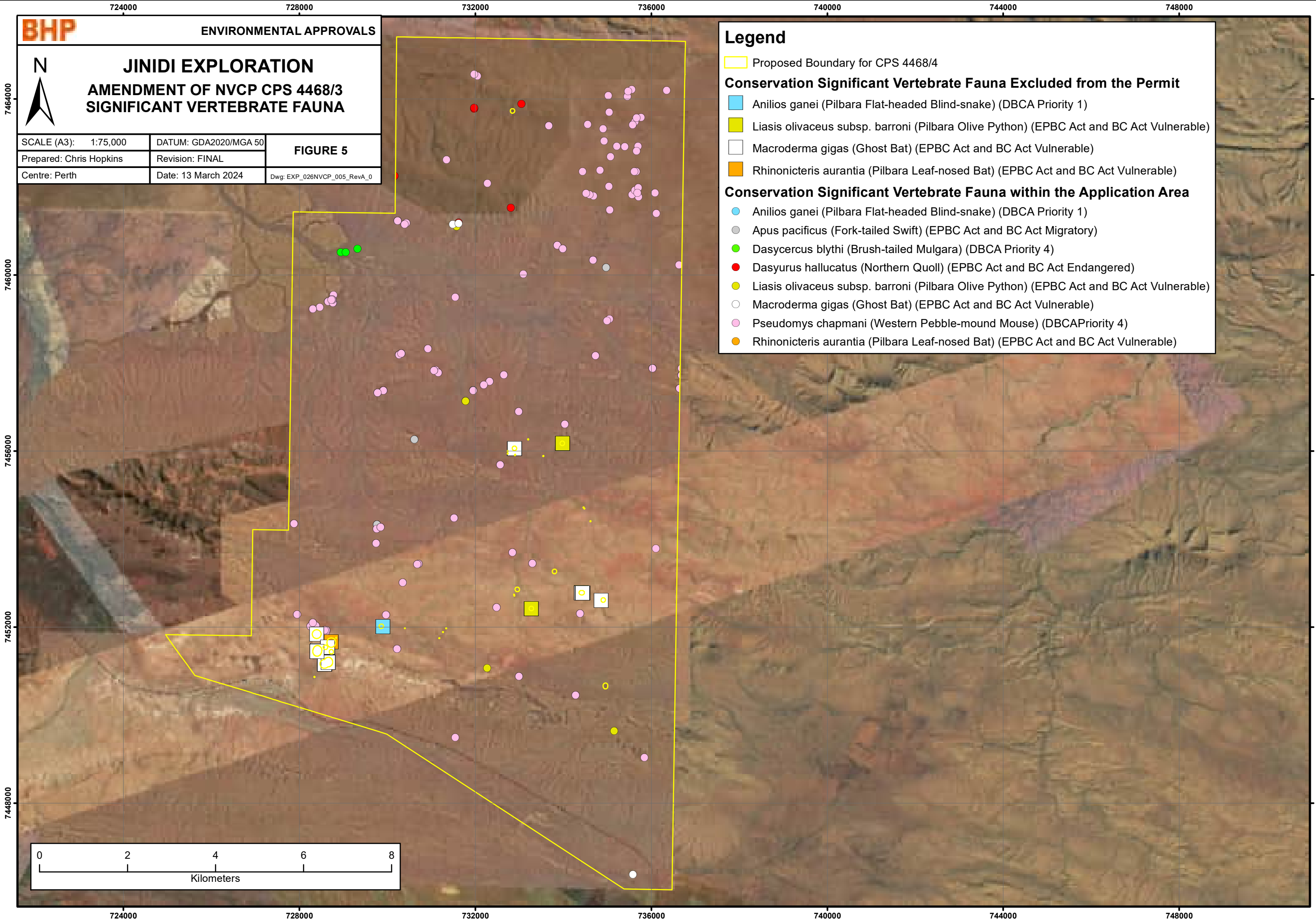
Proposed Boundary for CPS 4468/4

#### Conservation Significant Vertebrate Fauna Excluded from the Permit

- Anilius ganeii (Pilbara Flat-headed Blind-snake) (DBCA Priority 1)
- Liasis olivaceus subsp. barroni (Pilbara Olive Python) (EPBC Act and BC Act Vulnerable)
- Macroderma gigas (Ghost Bat) (EPBC Act and BC Act Vulnerable)
- Rhinonictes aurantia (Pilbara Leaf-nosed Bat) (EPBC Act and BC Act Vulnerable)

#### Conservation Significant Vertebrate Fauna within the Application Area

- Anilius ganeii (Pilbara Flat-headed Blind-snake) (DBCA Priority 1)
- Apus pacificus (Fork-tailed Swift) (EPBC Act and BC Act Migratory)
- Dasyurus blythi (Brush-tailed Mulgara) (DBCA Priority 4)
- Dasyurus hallucatus (Northern Quoll) (EPBC Act and BC Act Endangered)
- Liasis olivaceus subsp. barroni (Pilbara Olive Python) (EPBC Act and BC Act Vulnerable)
- Macroderma gigas (Ghost Bat) (EPBC Act and BC Act Vulnerable)
- Pseudomys chapmani (Western Pebble-mound Mouse) (DBCA Priority 4)
- Rhinonictes aurantia (Pilbara Leaf-nosed Bat) (EPBC Act and BC Act Vulnerable)



# Appendices

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**Appendix 1: Jinidi Detailed Flora and Vegetation Survey Interim Report: Dry-season  
(Biologic, 2024a)**

**Appendix 2: Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore  
Pilbara Tenure (Onshore Environmental, 2014)**

**Appendix 3: Jinidi Targeted Vertebrate Fauna Survey (Biologic, 2024b)**