

Application to Amend NVCP CPS 5990/1 Orebodies 21 and 22

**Native Vegetation Clearing Permit Amendment
Application Supporting Document**

November 2023



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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 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 5990/1 for the purposes of mineral exploration, geological and hydrogeological investigations and associated activities (**Figure 1**). The clearing period of this permit expires on 14 April 2024.

The full extent of these works is yet to be undertaken and therefore BHP therefore seeking to:

- Amend the purpose to include weather masts and LiDAR;
- Extend the permit duration to 30 November 2034;
- Extend the clearing period to 30 November 2029; and
- Extend the final reporting date to 30 November 2034.

BHP is also seeking to:

- Update the Permit Holder to BHP Iron Ore Pty Ltd.;
- Amend the permit boundary to exclude a number of caves and water holes that have been identified since the permit was last issued;
- Remove Condition 9(a) as the area has been surveyed for significant flora species; and
- Remove Condition 9(b)(i) as there are no threatened (formerly rare) flora species within the application boundary.

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 5990/1 to the Department of 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 8 km east of Newman in the Pilbara region of Western Australia (**Figure 1**).

1.2 TENURE

The Amendment Application Area is located on State Agreement Mining Lease 244SA (M244SA).

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 NJV. The split between the partners of the NJV is as follows:

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

The key contact for this proposal is:

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1.5 PROJECT DESCRIPTION

The proposed works will involve clearing for the purposes of mineral exploration, geological and hydrogeological investigations, weather masts, LiDAR and 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	DMIRS
Permit Title	Orebody 21 and 22 Exploration Project
Area to be cleared	19910 0 hectares
Amendment Application Area	3,841.55 ha
Purpose of the permit	Clearing for the purposes of mineral exploration, geological and hydrogeological investigations, weather masts, LiDAR and associated activities
Tenure	Mineral Lease M244SA.
Clearing Duration	Until 30 November 2029
Permit Duration	Until 30 November 2034
Proposed Annual Reporting Date	01 October for the previous Financial Year
Proposed Final Reporting Date	30 30 November 2034
Application boundary	Map Reference: <ul style="list-style-type: none"> • EXP_024NVCP_001_RevA_0 • EXP_024NVCP_002_RevA_0 • EXP_024NVCP_003_RevA_0 • EXP_024NVCP_004_RevA_0 • EXP_024NVCP_005_RevA_0 BHP Shapefile D2 Reference: https://waio-dctm.bhp.com/D2/?docbase=bhpbio_od_prod&locateld=0b03c41a845d5961&application=ManagedDocuments
Application Commitments	
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
In the event that active Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable.	3.4.4 6.2

Active mounds of the Western Pebble-mound Mouse 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 commenced in 2014 with a total of 107.54 ha cleared to the end of FY23 with 4.17 ha rehabilitated (BHP, 2023). The remaining locations cleared are still required for the purpose for which they were cleared.

Clearing has been minimised by restricting activities to the minimal required for safety and equipment access. 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.

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 323.8 mm (BoM, 2023a). This is mainly derived from tropical storms and cyclones during summer, producing sporadic, heavy rains over the area. Mean monthly rainfall varies from 4.7 mm in September to 72.3 mm in February (BoM, 2023a). Daily rainfall is highly variable; the highest maximum daily rainfall ranges from 34.8 mm in October, to 305.6 mm in February (BoM, 2023a). The mean maximum temperature in summer months (October to March) is 35.1°C to 39.3°C, and mean maximum temperature in winter (April to September) is between 23.1°C and 32.2°C (BoM, 2023a).

Wittenoom meteorological site (005026) is the closest station to the Amendment Application Area that records daily evaporation. Wittenoom is located approximately 200 km north west 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, 2023b).

3.2 BIOREGION, LANDFORMS AND LAND SYSTEMS

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

- 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).
- Augustus subregion (GAS3) of the Gascoyne region described as: *“Rugged low Proterozoic sedimentary and granite ranges divided by broad flat valleys. Also includes the Narryera Complex and Bryah Basin of the Proterozoic Capricorn Orogen (on northern margin of the Yilgarn Craton), as well as the Archaean Marymia and Sylvania Inliers. Although the Gascoyne River System provides the main drainage of this subregion, it is also the headwaters of the Ashburton and Fortescue Rivers. There are extensive areas of alluvial valley-fill deposits. Mulga woodland with Triodia occur on shallow stony loams on rises, while the shallow earthy loams over hardpan on the plains are covered by Mulga parkland. A desert climate with bimodal rainfall.”* (Desmond et al, 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 and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands.
- Newman: Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.
- River: “Narrow floodplains and major channels.”
- 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.”

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 three soil types occur within the Amendment Application Area (CSIRO, 2021):

- BE6: Extensive flat and gently sloping plains, which sometimes have a surface cover of gravels and on which red-brown hardpan frequently outcrops: chief soils are shallow earthy loams.
- Fa13: Loamy soils with weak pedological development; largely associated with the Hamersley ranges. Shallow coherent and porous loamy soils; ranges of banded jaspilite and chert along shales, dolomites and iron formations; some areas of ferruginous duricrust and narrow winding valley plains and steeply dissected pediments. The soils are frequently shallow and stony and there are extensive areas without soil cover: chief soils are stony earthy loams.

Mz25: Plains associated with the Fortescue valley; there is a surface cover of stony gravels close to the ranges and hills: chief soils are acid red earths with some neutral red earths; red-brown hardpan is absent. Associated are areas of calcareous earths and loams on calcrete (kunkar) and some hard red soils around creek lines.

3.4 FLORA, VEGETATION AND FAUNA

A total of 37 flora and vegetation surveys have previously been completed within and adjacent (within 2 km) the proposed Amendment Application Area. The key flora and vegetation surveys relevant to this application are:

- East Ophthalmia & Ninga Detailed Flora & Vegetation Survey (Spectrum Ecology and Spatial, 2022) (**Appendix 1**);
- Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure (Onshore Environmental, 2014) (**Appendix 2**);
- Ninga Flora and Vegetation Assessment (Astron, 2013) (**Appendix 3**);
- Targeted Survey for *Acacia* sp. East Fortescue (surrounding OB31) (Onshore Environmental, 2015) (**Appendix 4**); and
- BHP WAIO Jimblebar *Eremophila capricornica* Targeted Flora Survey (Biologic, 2021) (**Appendix 5**).

A total of thirty vertebrate fauna surveys have been completed within and adjacent (within 10 km) of the Amendment Application Area. The key vertebrate fauna surveys relevant to this application are:

- Consolidated Fauna Habitat Mapping (Biologic Environmental Survey, 2017) (**Appendix 6**);
- Jimblebar Targeted Ghost Bat Survey (GHD, 2020) (**Appendix 7**);
- OB19 Vertebrate Survey (Biologic, 2014) (**Appendix 8**); and
- Ninga Vertebrate Fauna Assessment (Eco Logical, 2013) (**Appendix 9**).

3.4.1 Vegetation Communities

The Amendment Application Area is located within the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara and Gascoyne Bioregions (Department of Environment and Heritage, 2005). According to the Government of Western Australia (2013), these bioregions are 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):

82	Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> .
216	Low woodland; mulga (with spinifex) on rises.

There is more than 98% 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
Gascoyne IBRA Bioregion	18,075,219	18,067,441	99.96	1.93
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
Vegetation association 82 within the Gascoyne IBRA	2,315	2,318	100.00	0.00
Vegetation association 216 within Western Australia	280,759	279,237	99.46	0.00
Vegetation association 216 within the Pilbara IBRA	26,670	26,373	98.89	0.00
Vegetation association 216 within the Gascoyne IBRA	254,090	252,864	99.52	0.00

A total of 16 broad floristic formations with 41 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 (Spectrum Ecology and Spatial, 2022; Onshore 2014; and Astron, 2013)

Broad Floristic Formation	Vegetation Association Description	
* <i>Cenchrus</i> Open Tussock Grassland	4c	Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Acacia citrinoviridis</i> over Tall Open Shrubland of <i>Petalostylis labicheoides</i> , <i>Santalum lanceolatum</i> and <i>Grevillea wickhamii</i> over Tussock Grassland of * <i>Cenchrus ciliaris</i> , <i>Enneapogon robustissimus</i> and <i>Eriachne mucronata</i> and Open Hummock Grassland of <i>Triodia epactia</i> .
* <i>Cenchrus</i> Tussock Grassland	MA CcTtEua ChCa AbAtpAss	Tussock Grassland of * <i>Cenchrus ciliaris</i> , <i>Themeda triandra</i> and <i>Eulalia aurea</i> with Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Corymbia aspera</i> over High Open Shrubland of <i>Acacia bivenosa</i> , <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> on brown loamy sand on levee banks of major drainage lines
<i>Acacia</i> High Shrubland	FP AaAssAanc Tp	High Shrubland of <i>Acacia aptaneura</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia ancistrocarpa</i> over Very Open Hummock Grassland of <i>Triodia pungens</i> on red brown sandy loam on floodplains and medium drainage lines.
	FP Aa Ch TtChfArc	High Shrubland of <i>Acacia aptaneura</i> with Low Open Woodland of <i>Corymbia hamersleyana</i> over Open Tussock Grassland of <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> and <i>Aristida contorta</i> on red loamy sand on floodplains.
<i>Acacia</i> Low Open Woodland	FP AaAciApr AsyAssAb Tp	Low Open Woodland of <i>Acacia aptaneura</i> , <i>Acacia citrinoviridis</i> and <i>Acacia pruinocarpa</i> over Open Shrubland of <i>Acacia synchronicia</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia bivenosa</i> over Very Open Hummock Grassland of <i>Triodia pungens</i> on red brown clay loam on floodplains and medium drainage lines
<i>Acacia</i> Low Woodland	FP AciChAa AancApypPI TtAriCc	Low Woodland of <i>Acacia citrinoviridis</i> , <i>Corymbia hamersleyana</i> and <i>Acacia aptaneura</i> over High Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> and <i>Petalostylis labicheoides</i> over Very Open Tussock Grassland of <i>Themeda triandra</i> , <i>Aristida inaequiglumis</i> and * <i>Cenchrus ciliaris</i> on brown sandy loam on floodplains and medium drainage lines.
<i>Acacia</i> Open Scrub	MI AtpPIAm TpTs ChEil	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.
<i>Acacia</i> Open Shrubland	SS TeAsEse	Open hummock grassland of <i>Triodia epactia</i> and <i>Triodia angusta</i> with very open tussock grassland of * <i>Cenchrus ciliaris</i> under Open shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> , <i>Stylobasium spathulatum</i> , and <i>Senna artemisioides</i> subsp. <i>oligophylla</i> . over and low open woodland of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> or <i>Corymbia hamersleyana</i> on orange sandy stone plains.
	SA AinErer	High open shrubland of <i>Acacia incurvaneura</i> , (+/-) <i>Acacia catenulata</i> subsp. <i>occidentalis</i> , and <i>Acacia ayersiana</i> over scattered tussock grasses of <i>Eragrostis eriopoda</i> , <i>Eriachne helmsii</i> , and or <i>Digitaria brownii</i> on orange sandy clay plains.
	SA AaCocTb	Open shrubland of <i>Acacia aptaneura</i> with lower shrubland of <i>Grevillea striata</i> , <i>Eremophila forrestii</i> subsp. <i>forrestii</i> with low open woodland of <i>Corymbia candida</i> over very open hummock grassland of <i>Triodia basedowii</i> and very open tussock grassland of <i>Aristida pruinosa</i> , and * <i>Cenchrus ciliaris</i> on orange sandy clay plains.
<i>Acacia</i> Shrubland	MI AmAancPI ChEil TtAri	Shrubland of <i>Acacia monticola</i> , <i>Acacia ancistrocarpa</i> and <i>Petalostylis labicheoides</i> with Scattered Low Trees of <i>Corymbia hamersleyana</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Tussock Grassland of <i>Themeda triandra</i> and <i>Aristida inaequiglumis</i> on red loamy sand on minor drainage lines
<i>Acacia</i> Tall Open Scrub	11b	This is a mosaic of two vegetation associations: 11a :Tall scrub of <i>Acacia ancistrocarpa</i> , <i>A. dictylophleba</i> , <i>Grevillea wickhamii</i> and <i>A. inaequilatera</i> over Open Hummock Grassland of <i>Triodia basedowii</i> , and <i>T. sp.</i> Shovelanna Hill (S. van Leeuwen 3835) and Very Open Tussock Grassland of <i>Paraneurachne muelleri</i> which occurs as a mosaic with vegetation association 5a.5a: Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus gamophylla</i> over Tall Shrubland of <i>Acacia monticola</i> , <i>Petalostylis labicheoides</i> and <i>Santalum lanceolatum</i> and <i>A. bivenosa</i> over Hummock Grassland of <i>Triodia epactia</i> and <i>T. basedowii</i> and Open Tussock Grassland of <i>Themeda triandra</i> .

Broad Floristic Formation	Vegetation Association Description	
Acacia Tall Shrubland	2a	Tall Open Shrubland to Tall Shrubland of <i>Acacia pruinoarpa</i> , <i>A. aptaneura</i> and <i>A. catenulata</i> subsp. <i>occidentalis</i> over Shrubland of <i>A. aptaneura</i> , <i>A. aneura</i> , <i>A. bivenosa</i> and <i>Eremophila forrestii</i> subsp. <i>forrestii</i> over Scattered Low Shrubs of <i>Scaevola parvifolia</i> subsp. <i>pilbarae</i> over Open Hummock Grassland of <i>Triodia basedowii</i> and Very Open Tussock Grasses of <i>Aristida contorta</i> , <i>Paraneurachne muelleri</i> and <i>Cymbopogon procerus</i> .
Corymbia Low Open Woodland	SP ChEoCd AancApaAads TbTscTs	Low Open Woodland of <i>Corymbia hamersleyana</i> , <i>Eucalyptus odontocarpa</i> and <i>Corymbia deserticola</i> subsp. <i>deserticola</i> over Open Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia pachyacra</i> and <i>Acacia adsurgens</i> over Open Hummock Grassland of <i>Triodia basedowii</i> , <i>Triodia schinzii</i> and <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) on red brown sandy loam on footslopes and stony plains.
Eucalyptus Open Woodland	MI EgAdTp	Low open woodland of <i>Eucalyptus gamophylla</i> over tall shrubland of <i>Acacia dictyophleba</i> , <i>Petalostylis labicheoides</i> and <i>Grevillea wickhamii</i> over hummock grassland of <i>Triodia pungens</i> on orange sandy clay in minor drainage line.
	MA EcoAciCyix	Low open woodland of <i>Eucalyptus camaldulensis</i> and <i>Eucalyptus victrix</i> over high open shrubland of <i>Acacia citrinoviridis</i> and (+/-) <i>Melaleuca glomerata</i> over very open sedgeland of <i>Cyperus ixiocarpus</i> and <i>Cyperus vaginatus</i> with very open tussock grassland of * <i>Cenchrus ciliaris</i> on orange sandy clay in major creek lines.
	ME EIIAciTt	Low open woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Eucalyptus victrix</i> over high open shrubland of <i>Acacia citrinoviridis</i> , <i>Acacia monticola</i> , and <i>Gossypium robinsonii</i> over very open tussock grassland of <i>Themeda triandra</i> , and * <i>Cenchrus ciliaris</i> tall sparse grassland with open hummock grassland of <i>Triodia pungens</i> on orange sandy clay in medium drainage line.
Eucalyptus Woodland	MA EcrEv AciApyMg CcEuaTt	Woodland of <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> and <i>Eucalyptus victrix</i> over High Open Shrubland of <i>Acacia citrinoviridis</i> , <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> and <i>Melaleuca glomerata</i> over Tussock Grassland of * <i>Cenchrus ciliaris</i> , <i>Eulalia aurea</i> and <i>Themeda triandra</i> on brown clay loam on banks of major drainage lines.
Themeda Tussock Grassland	GG TtErmuThmb EIIChCf AtpGoroPI	Tussock Grassland of <i>Themeda triandra</i> , <i>Eriachne mucronata</i> and <i>Themeda</i> sp. Mt Barricade with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Corymbia hamersleyana</i> and <i>Corymbia ferriticola</i> over High Shrubland of <i>Acacia tumida</i> var. <i>pilbarensis</i> , <i>Gossypium robinsonii</i> and <i>Petalostylis labicheoides</i> on red brown sandy loam on narrowly incised rocky drainage lines
	ME TtChfEua ExEvCh PIApaApy	Tussock Grassland of <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> and <i>Eulalia aurea</i> with Low Open Woodland of <i>Eucalyptus xerothermica</i> , <i>Eucalyptus victrix</i> and <i>Corymbia hamersleyana</i> and Shrubland of <i>Petalostylis labicheoides</i> , <i>Acacia pachyacra</i> and <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> on red sandy loam on medium drainage lines.
	MI TtCyoErmu ChEg GrwhPIErti	Tussock Grassland of <i>Themeda triandra</i> , <i>Cymbopogon obtectus</i> and <i>Eriachne mucronata</i> with Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus gamophylla</i> over High Open Shrubland of <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> , <i>Petalostylis labicheoides</i> and <i>Eremophila tietkensisii</i> on red loamy sand on minor drainage lines
Triodia Hummock Grassland	3a	3a: Low Open Woodland of <i>Hakea lorea</i> subsp. <i>lorea</i> and <i>Corymbia aspera</i> over Scattered Tall Shrubs of <i>Acacia pruinoarpa</i> over Hummock Grassland of <i>Triodia schinzii</i> and Scattered herbs of <i>Bonamia rosea</i> and <i>Duperreya commixta</i> .
	3c	3c: Scattered Low Trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Scattered Tall Shrubs of <i>Acacia pruinoarpa</i> and <i>A. aptaneura</i> over Low Open Shrubland of <i>A. hilliana</i> and <i>A. adoxa</i> var. <i>adoxo</i> over Open Hummock Grassland of <i>Triodia basedowii</i> .
	FP Tb AaApr Erff	Hummock Grassland of <i>Triodia basedowii</i> with Low Open Woodland of <i>Acacia aptaneura</i> and <i>Acacia pruinoarpa</i> over Open Shrubland of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> on red sandy loam on floodplains
	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
	GG Tp EIIcF Dop	Hummock Grassland of <i>Triodia pungens</i> with Low Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia ferriticola</i> over Open Shrubland of <i>Dodonaea pachyneura</i> on red brown sandy clay loam in gullies

Broad Floristic Formation	Vegetation Association Description	
	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 Tb Ell AbAiPI	Hummock Grassland of <i>Triodia basedowii</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Shrubland of <i>Acacia bivenosa</i> , <i>Acacia inaequilatera</i> and <i>Petalostylis labicheoides</i> on red brown sandy loam on lower hill slopes.
	HS Tp AoAi SeaolnrSiar	Hummock Grassland of <i>Triodia pungens</i> with High Open Shrubland of <i>Acacia orthocarpa</i> and <i>Acacia inaequilatera</i> and Low Open Shrubland of <i>Senna artemisioides</i> subsp. <i>oligophylla</i> , <i>Indigofera rugosa</i> and <i>Sida arsinata</i> on brown loamy sand on dolerite hills and steep scree slopes below ironstone ridges.
	HS TpTs CdEll AancAbAten	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 deserticola</i> subsp. <i>deserticola</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia bivenosa</i> and <i>Acacia tenuissima</i> on red loamy sand on lower hill slopes and footslopes
	HS Ts	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) on red brown sandy loam on hill slopes
	HS TsAbEll	Hummock grassland of <i>Triodia vanleeuwenii</i> and <i>Triodia pungens</i> with very open tussock grassland of <i>Eriachne lanata</i> under open shrubland of <i>Acacia bivenosa</i> and or <i>Acacia hilliania</i> and woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> on stony hillslopes.
	HS TsTwTp EllCh 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 hilliania</i> and <i>Acacia adoxa</i> var. <i>adoxo</i> on red brown sandy loam on hill slopes
	HS Tw EllChHc AancAbAa	Hummock Grassland of <i>Triodia wiseana</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Corymbia hamersleyana</i> and <i>Hakea chordophylla</i> and Open Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia bivenosa</i> and <i>Acacia aptaneura</i> on red sandy loam on hill slopes
	MI TsTp AancAmGrw h	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) and <i>Triodia pungens</i> with Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia monticola</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> on brown sandy loam on minor drainage lines
	SP TpTb Eg PIAbAanc	Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia basedowii</i> with Open Mallee of <i>Eucalyptus gamophylla</i> and Shrubland of <i>Petalostylis labicheoides</i> , <i>Acacia bivenosa</i> and <i>Acacia ancistrocarpa</i> on red brown loamy sand on stony plains and footslopes
	SS TbApaCh	Hummock grassland of <i>Triodia basedowii</i> with scattered tussock grasses of <i>Paraneurachne muelleri</i> and <i>Eragrostis eriopoda</i> under open shrubland of <i>Acacia pachyacra</i> , <i>Acacia aptaneura</i> , and <i>Hakea chordophylla</i> and scattered tall <i>Corymbia hamersleyana</i> trees on orange sandy stone plains.
	UH TsSeglCh	Hummock grassland of <i>Triodia vanleeuwenii</i> , and <i>Triodia pungens</i> with very open tussock grassland of <i>Paraneurachne muelleri</i> under open shrubland of <i>Senna glutinosa</i> subsp. x <i>luerssenii</i> , (+/-) <i>Acacia bivenosa</i> and <i>Grevillea wickhamii</i> subsp. <i>aprica</i> and woodland of <i>Corymbia deserticola</i> subsp. <i>deserticola</i> , <i>Corymbia hamersleyana</i> , and <i>Eucalyptus gamophylla</i> on orange sandy stone undulating low hills.
Triodia Open Hummock Grassland	ME TscTs Ch AadsErloAanc	Open Hummock Grassland of <i>Triodia schinzii</i> and <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) with Scattered Low Trees of <i>Corymbia hamersleyana</i> over Open Shrubland of <i>Acacia adsurgens</i> , <i>Eremophila longifolia</i> and <i>Acacia ancistrocarpa</i> on red sandy loam on medium drainage lines
	HS TpTb EllAaAcao SesSeglErcu	Open Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia basedowii</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Acacia aptaneura</i> and <i>Acacia catenulata</i> subsp. <i>occidentalis</i> over Open Shrubland of <i>Senna stricta</i> , <i>Senna glutinosa</i> subsp. x <i>luerssenii</i> and <i>Eremophila cuneifolia</i> on orange sandy loam on hill slopes
	HS TbTs AsyAaAte ErcuMagSol	Open Hummock Grassland of <i>Triodia basedowii</i> and <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) with Open Shrubland of <i>Acacia synchronicia</i> , <i>Acacia aptanera</i> and <i>Acacia tetragonophylla</i> over Low Open Shrubland of <i>Eremophila cuneifolia</i> , <i>Maireana georgei</i> and <i>Solanum lasiophyllum</i> on red sandy loam on floodplains and lower hill slopes.

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 is more than 50km north west.

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.

Five Priority Flora have been identified adjacent to the Amendment Application Area (**Figure 3**):

- *Aristida jerichoensis* var. *subspinulifera* (Priority 3);
- *Bulbostylis burbridgeae* (Priority 4);
- *Gymnanthera cunninghamii* (Priority 3);
- *Isotropis parviflora* (Priority 3); and
- *Triodia* sp. Mt Ella (M.E. Trudgen 12739) (Priority 3).

Populations of Priority flora have been clipped from the Amendment Application Area using a 10 m buffer, where practicable.

3.4.3 Weeds

Twenty four introduced flora species (weeds) have been recorded within the Amendment Application Area (**Table 4**). Control of established weed populations will be carried out according to BHP's standard *Weed Control and Management Procedures*.

Table 4 Introduced Flora of the Amendment Application Area

Species	Common Name	DPAW Rating (DPAW, 2016)	Declared Pest ¹
* <i>Aerva javanica</i>	Kapok Bush	High and Rapid	No
* <i>Bidens bipinnata</i>	Bipinnate Beggartick	Unknown and Rapid	No
* <i>Brassica tournefortii</i>	Mediterranean Turnip		No
* <i>Cenchrus ciliaris</i>	Buffel Grass	High and Rapid	No
* <i>Cenchrus setiger</i>	Birdwood Grass	High and Rapid	No
* <i>Chloris barbata</i>	Purpletop Feathertop	High and Rapid	No
* <i>Citrullus amarus</i>	Bitter melon	Unknown and Moderate	No
* <i>Cynodon dactylon</i>	Couch	High and Rapid	No
* <i>Datura leichhardtii</i>	Native Thornapple	Unknown and Unknown	No
* <i>Digitaria ciliaris</i>	Summer Grass	Low and Slow	No
* <i>Echinochloa colona</i>	Awnless Barnyard Grass	High and Rapid	No
* <i>Erigeron bonariensis</i>	Flax leaf Fleabane		No
* <i>Euphorbia hirta</i>	Asthma Plant	Low and Slow	No
* <i>Lactuca serriola</i>	Prickly Lettuce		No
* <i>Malvastrum americanum</i>	Spiked Malvastrum	High and Rapid	No
* <i>Rumex vesicarius</i>	Ruby Dock	High and Rapid	No
* <i>Setaria verticillata</i>	Whorled Pigeon Grass	High and Rapid	No
* <i>Sisymbrium orientale</i>	Indian Hedge Mustard	Low and Unknown	No
* <i>Solanum nigrum</i>	Black Berry Nightshade	Low and Rapid	No
* <i>Sonchus asper</i>	Spiny Sowthistle		No
* <i>Sonchus oleraceus</i>	Common Sowthistle	Low and Rapid	No
* <i>Tribulus terrestris</i>	Caltrop	Unknown and Moderate	No
* <i>Tridax procumbens</i>	Tridax		No
* <i>Vachellia farnesiana</i>	Mimosa Bush	High and Rapid	No

3.4.4 Fauna Habitats and Significant Fauna

Biologic (2014 and 2017) identified the following eight vertebrate fauna habitats within the Amendment Application Area (**Figure 4**):

¹ Biosecurity and Agriculture Management Act, 2007 (BAM Act) s22

Figure 3: Renewal of NVCP CPS 5990/1 OB21 and OB22 Exploration – Significant Flora

Figure 4: Renewal of NVCP CPS 5990/1 OB21 and OB22 Exploration – Vertebrate Fauna Habitat

- **Breakaway / Cliff:** Breakaways/Cliffs are rugged, incised rocky hills and ranges. They tend to contain large rock fragments and more rock outcropping than other fauna habitats. Significant habitat features such as caves were sometimes 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:** Characterised by *Eucalyptus xerothermica* and *Corymbia hamersleyana* woodland over broad-leafed *Acacia* shrubland on sandy loam soils sometimes with exposed rocky areas. These can have high vegetation density, complexity and diversity, and because they tend to occur on accretional or depositional areas, often have deeper and richer soils than other fauna habitats. Grasses tend to be dominated by tussock grasses rather than spinifex, or the weed Buffel Grass **Cenchrus ciliaris*.
- **Gorge / Gully:** Gorges and gullies are rugged, steep-sided valleys incised into the surrounding landscape. Gorges tend to be 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.
- **Hillcrest / Hill slope:** These fauna habitats tend to be more open and structurally simple due to their recent depositional history than other fauna habitats, and are dominated by varying species of spinifex. A common feature of these habitats is a rocky substrate, often with exposed bedrock, and skeletal red soils. These are usually dominated by *Eucalyptus* woodlands, *Acacia* and *Grevillea* scrublands and *Triodia* spp. low hummock grasslands.
- **Minor Drainage Line:** Located within the minor gullies and depressions, generally through the Crest/Slope habitat. Consists primarily of *Acacia* low shrubland. The understorey generally lacks density and often consists solely of sparse tussock grassland, often including the weed Buffel Grass **Cenchrus ciliaris* where it has been introduced. The substrate can be sandy in places but generally consists of a skeletal loam gravel or stone.
- **Major Drainage Line:** Major Drainage Lines comprise mature River Red Gums (*Eucalyptus camaldulensis*), Coolibahs and stands of Silver Cadjeput (*Melaleuca argentea*) over river pools. Open, sandy or gravelly riverbeds characterise this habitat type. In ungrazed areas, the vegetation adjacent to the main channel or channels is denser, taller and more diverse than adjacent terrain and can include reedbeds around pools.
- **Sand Plain:** Sand Plain habitat is characterised by relatively deep sandy soils supporting dense spinifex grasslands and sparse shrubs. This habitat transitions into patches of Mulga in places. This habitat often occurs as terraces along Major Drainage Lines.
- **Stony Plain:** These are erosional surfaces of gently undulating plains, ridges and associated footslopes. Mainly support hard spinifex (and occasionally soft spinifex) with a mantle of gravel and pebbles.

There are a number of caves and waterholes identified adjacent to the amendment Application Area which have been clipped from the proposed boundary of the Amendment Application Area. Ghost bats have not been recorded from these caves with two classified as possible feed roosts and one as a possible night roost.

The Biologic (2017) *Consolidated Fauna Habitat Mapping BHP Billiton Iron Ore Pilbara Tenure (Appendix 6)* undertook a detailed review of all previous fauna surveys across BHP's Pilbara operations and the outputs from the Onshore Environmental (2014) Consolidation project. This review was supported by field visits where the analysis indicated that further information was required to confirm the fauna habitats.

The Project resolved the inconsistencies between previous mapping and created one consolidated regional GIS database which:

- Serves as BHP's base line fauna habitat dataset.
- Maps and describes a total of 17 fauna habitats across BHP's Pilbara operations; and
- provides consistency in methods and nomenclature across BHP's Pilbara operations.

The fauna habitats identified within the Amendment Application Area extend beyond the project boundary and are common in the surrounding region.

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

- Brush-tailed mulgara (*Dasyercus blythi*) (DBCA Priority 4);
- Grey Falcon (*Falco hypoleucos*) (Vulnerable, EPBC Act; Vulnerable, BC Act)
- Pilbara Olive Python (*Liasis olivaceus barroni*) (Vulnerable, EPBC Act; Vulnerable, BC Act); and
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (DBCA Priority 4).

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):

- Curlew Sandpiper (*Calidris ferruginea*) (Critically Endangered, EPBC Act; Critically Endangered, BC Act).
- Fork-tailed Swift (*Apus pacificus*) (Migratory, EPBC Act; Schedule 5, BC Act);
- Ghost Bat (*Macroderma gigas*) (Vulnerable EPBC Act; Vulnerable BC Act);
- Peregrine Falcon (*Falco peregrinus*) ('Other Specially Protected Fauna' BC Act);
- Pilbara Flat-headed Blind-snake (*Anilius ganei*) (DBCA Priority 1);
- Pilbara Leaf-nosed Bat (*Rhinonictis aurantia*) (Vulnerable EPBC Act; Vulnerable BC Act);
- Spotted *Ctenotus* (*Ctenotus uber* subsp. *johnstonei*) (DBCA Priority 2);

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 5**.

Table 5 Significant Fauna Potentially Occurring within the Amendment Application Area

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Birds					
Curlew Sandpiper (<i>Calidris ferruginea</i>)	Critically Endangered, EPBC Act Critically Endangered, BC Act)	The Curlew Sandpiper is a summer non-breeding migratory shorebird that occurs along most of the coast of Western Australia (Geering <i>et al.</i> , 2007). It inhabits exposed tidal mudflats, and is less frequently found on inland freshwater wetlands (Geering <i>et al.</i> , 2007). This Migratory bird breeds in Siberia and migrates to Australian waters in August to April (Pizzey and Knight, 2007). It is abundant to common around Perth and Mandurah. This species is found in coastal and inland mudflats and sometimes on salt works (Simpson and Day, 2004).	This species has been recorded at Ophthalmia Dam (DEC 2013b) and due to the proximity to the dam this species may fly over the Amendment Application Area. The Major Creek Line habitat type within the Amendment Application Area represents potentially suitable, albeit marginal, seasonal foraging habitat.	Possible	Low Although the Amendment Application Area contains some potentially suitable, albeit marginal, seasonal foraging habitat, the species is more typically associated with marine and tidal estuaries found on the coast of Western Australia.
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.	Likely	Negligible 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 been recorded flying within the Amendment Application Area. Potential nesting habitat occurs for this species in the taller trees of the Major Drainage Line and the Breakaway habitat type. Suitable foraging and potential breeding habitats for this species within the Amendment Application Area include the Major Creek Line habitat.	Recorded	Low The Grey Falcon could potentially nest in the taller trees of the Major Drainage Line habitat and larger cliff edges of Amendment Application Area. Given that the habitat for this species occurs extensively throughout the Pilbara and its ability to egress from the area, the proposed clearing activities will have negligible impact on the Grey Falcon.
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).	While this species has not been recorded within the Amendment Application Area the steep rocky canyon habitat type of the Amendment Application Area represent potentially suitable nesting habitat. All habitat types within the Amendment Application Area are potential foraging habitat.	Possible	Low The proposed clearing activities are unlikely to impact on the Peregrine Falcon as it has the ability to egress from areas being disturbed. The habitat that could potentially be associated with this species also occurs extensively throughout the Pilbara.

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Mammals					
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.	Sandplain habitat of the Amendment Application Area represent suitable habitat for this species. Sandplains are present within Amendment Application Area (on the southern end) and adjacent to the Amendment Application Area. There are three records from the eastern edge and six records along the southern edge of the Amendment Application area, as well as multiple records in the broader region.	Recorded	Low Nine Mulgara have been recorded from the Amendment Application Area and are managed under Condition 5. A small area of preferred habitat (sandplain) occurs within the Amendment Application Area. There are large areas of Sandplain habitat outside of the Amendment Application Area and in the broader region. In the event that 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).	While there is no record of Ghost Bats within the Amendment Application Area they may forage in the Hill Crest habitat type. <i>Biologic</i> (2014) identified a number of caves within the Gorge / Gully habitat adjacent to the Amendment Application Area which, while they exhibited no evidence of recent use, may provide potential feeding roosts. These caves have been excluded from the Amendment Application Area with a 50m buffer.	Possible	Low This species may forage over the habitats within the Amendment Application Area and surrounds. As no suitable roosting habitat occurs within the Amendment Application Area, the Ghost Bat would not be dependant on the habitats present within the Amendment Application Area.
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).	The Hillcrest / Hill slope and Stony Plain habitats of the Amendment Application Area is suitable for this species. This species has been recorded within the Amendment Application Area. Active mounds of the Western Pebble-mound Mouse will be avoided using a 10 m buffer, where practicable.	Recorded	Low There are large areas of suitable habitat adjacent to the Amendment Application Area. Active mounds of the Western Pebble-mound Mouse will be avoided using a 10 m buffer, where practicable.

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Reptiles					
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)	Little is known about this species habitat preferences and it may occur within habitats of the Amendment Application Area. This species is likely to occur in deeper gorge and gully habitat which are typically avoided during exploration activities.	Possible	Low This species may utilise the habitat types within the Amendment Application Area however is unlikely to be reliant on the areas within the Amendment Application Area.
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).	Within the Amendment Application Area, potential habitat for this species exists within the Major Drainage Line Habitat and the rocky features associated with the Hillcrest/ Hillslope and Gorge/ Gully habitat types. This species has been recorded from one location within the Amendment Application Area, two locations in close proximity to waterhole features, which have been clipped from the Amendment Application Area with a 10 m buffer and five locations within 1 km of the Amendment Application Area.	Recorded	Low Pilbara Olive Python may forage within the Major Drainage Line, Hillcrest/ Hillslope and Gorge/ Gully habitats within the Amendment Application Area but are unlikely to be reliant on these habitats.

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 is one main aquifer within the Amendment Application Area, the 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)”.

3.6 SURFACE WATER

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

The Fortescue River flows through the western edge of the Amendment Application Area. There are also a number of non-perennial minor drainage lines that flow across 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 6 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle A.

Table 6 Assessment against Principle A components

Principle	Criteria	Assessment	Outcome
a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	a1) Native vegetation should not be cleared if it is representative of an area of outstanding biodiversity in the Bioregion.	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.	Not at variance with clearing principle.
	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.	The native vegetation within the Amendment Application Area is in the same condition as other areas of similar vegetation type within the broader region.	Not at variance with clearing principle.
	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.	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.	Not at variance with clearing principle.
	a4) Native vegetation should not be cleared if it has higher ecosystem diversity than other native vegetation of that local area.	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.	Not at variance with clearing principle.
	a5) Native vegetation should not be cleared if it has higher genetic diversity than the remaining native vegetation of that ecological community.	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.	Not at variance with clearing principle.
	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.	Five 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.	Not at variance with clearing principle.

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 eight broad fauna habitat types within the Amendment Application Area (**Figure 4**).

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

Four fauna species of significance have been recorded from within the Amendment Application Area with an additional seven species considered to potentially occur within the Amendment Application Area (**Table 5**). As described in **Section 3.4.4** and **Table 5** clearing of the Amendment Application Area is expected to have a low impact on these species.

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

Table 7 Assessment against Principle B components

Principle	Criteria	Assessment	Outcome
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.	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>Two BC Act protected species have been recorded from the Amendment Application and five BC Act protected species are considered 'possible' or 'likely' to occur within the Amendment Application Area (Table 5). The proposed activities are unlikely to have a significant impact on these species as:</p> <ul style="list-style-type: none"> • All species are wide-ranging and found throughout the broader region; • All suitable cave and waterhole habitats have been clipped from the Amendment Application Area; • All species are only likely to forage within the Amendment Application Area; • These species do not exclusively depend on any habitat type or feature within the Amendment Application Area; and • Similar habitat is well represented outside the Amendment Application Area. 	Not at variance with clearing principle.
	b2) Native vegetation should not be cleared if it is or is likely to be habitat for Priority Listed Fauna.	<p>Two priority fauna species have been recorded within the Amendment Application Area. As detailed in Table 5 these species is unlikely to be impacted for the following reasons:</p> <ul style="list-style-type: none"> • The preferred habitat for these species is well represented outside the Amendment Application Area; • 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; and • In the event that active Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable. Known locations are managed under Condition 5 of CPS 5990/1; • Active mounds of the Western Pebble-mound Mouse will be avoided using a 10 m buffer, where practicable. 	Not at variance with clearing principle.
	b3) Native vegetation should not be cleared if it is or is likely to be habitat for fauna that is otherwise significant.	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	Not at variance with clearing principle.
	b4) Native vegetation should not be cleared if it provides significant habitat for fauna species in the local area.	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.	Not at variance with clearing principle.
	b5) Native vegetation should not be cleared if it maintains ecological functions and processes that protect significant habitat for fauna.	The clearing of native vegetation is not considered to alter ecological functions and processes that protect significant habitat for fauna.	Not at variance with clearing principle.

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

Table 8 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 (Spectrum Ecology and Spatial, 2022; Biologic, 2021; Onshore Environmental, 2015; Astron, 2013).	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 (Spectrum Ecology and Spatial, 2022; Biologic, 2021; Onshore Environmental, 2015; Astron, 2013).	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 2160/3 are associated with a TECs or PECs (Spectrum Ecology and Spatial, 2022; Onshore Environmental, 2014). The closest PEC is more than 35km north of the Amendment Application Area (**Section 3.4.1**). **Table 9** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle D.

Table 9 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>The Amendment Application Area falls within part of the 'Ethel Gorge aquifer stygobiont community' TEC. This TEC is a groundwater ecosystem and the proposed clearing is not anticipated to lead to any impacts to the groundwater values of the area and therefore will not impact on the TEC. No other 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 10 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle E.

Table 10 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.

The Fortescue River flows through the western edge of the Application Area. There are also a number of non-perennial minor drainage lines that flow across the 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 11 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle F.

Table 11 Assessment against Principle F components

Principle	Criteria	Assessment	Outcome
f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	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.	A major watercourse, the Fortescue River, is located within the Amendment Application Area. Any disturbance at the Fortescue River will be kept to a bare minimum and utilise previously disturbed areas where possible.	Unlikely to be at variance with clearing principle.
	f2) Native vegetation should not be cleared if it provides a buffer area for watercourses and wetlands identified in criteria (f1) and (f2).	A major watercourse, the Fortescue River, is located within the Amendment Application Area. Any disturbance at the Fortescue River will be kept to a bare minimum and utilise previously disturbed areas where possible	Unlikely to be at variance with clearing principle.
	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.	Due to the small scale of clearing associated with this Application it 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.	Not at variance with clearing principle.
	f4) Native vegetation should not be cleared if it is growing in other watercourses or wetlands.	Disturbance of the minor non-perennial creeks within the Amendment Application Area, with any disturbance kept to a bare minimum and utilise previously disturbed areas where possible	Unlikely to be at variance with clearing principle.

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 12** 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

Twenty four 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 12 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 130 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 13** below.

Table 13 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 130 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.

The Fortescue River flows through the western edge of the Application Area. There are also a number of non-perennial minor drainage lines that flow across the Application Area.

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

Table 14 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 15 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle J.

Table 15 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 Project Area falls within the Nyiyaparli Native Title Claim (WC05/6). Archaeological and ethnographic surveys of the proposed Amendment Application Area have been undertaken by BHP and a number of heritage sites have been identified. All heritage sites will be avoided, however if any heritage site cannot practicably be avoided, BHP 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 in the Amendment Application Area is unlikely to be at variance to any of the Ten Clearing Principles. CPS 5990/1 authorises the clearing of up to 190 ha. To date BHP has cleared 107.54 ha and the clearing of the remaining 82.46 ha within an Amendment Application Area of 3,841.55 ha is unlikely to have any significant negative impacts on biodiversity and environmental values in the area.

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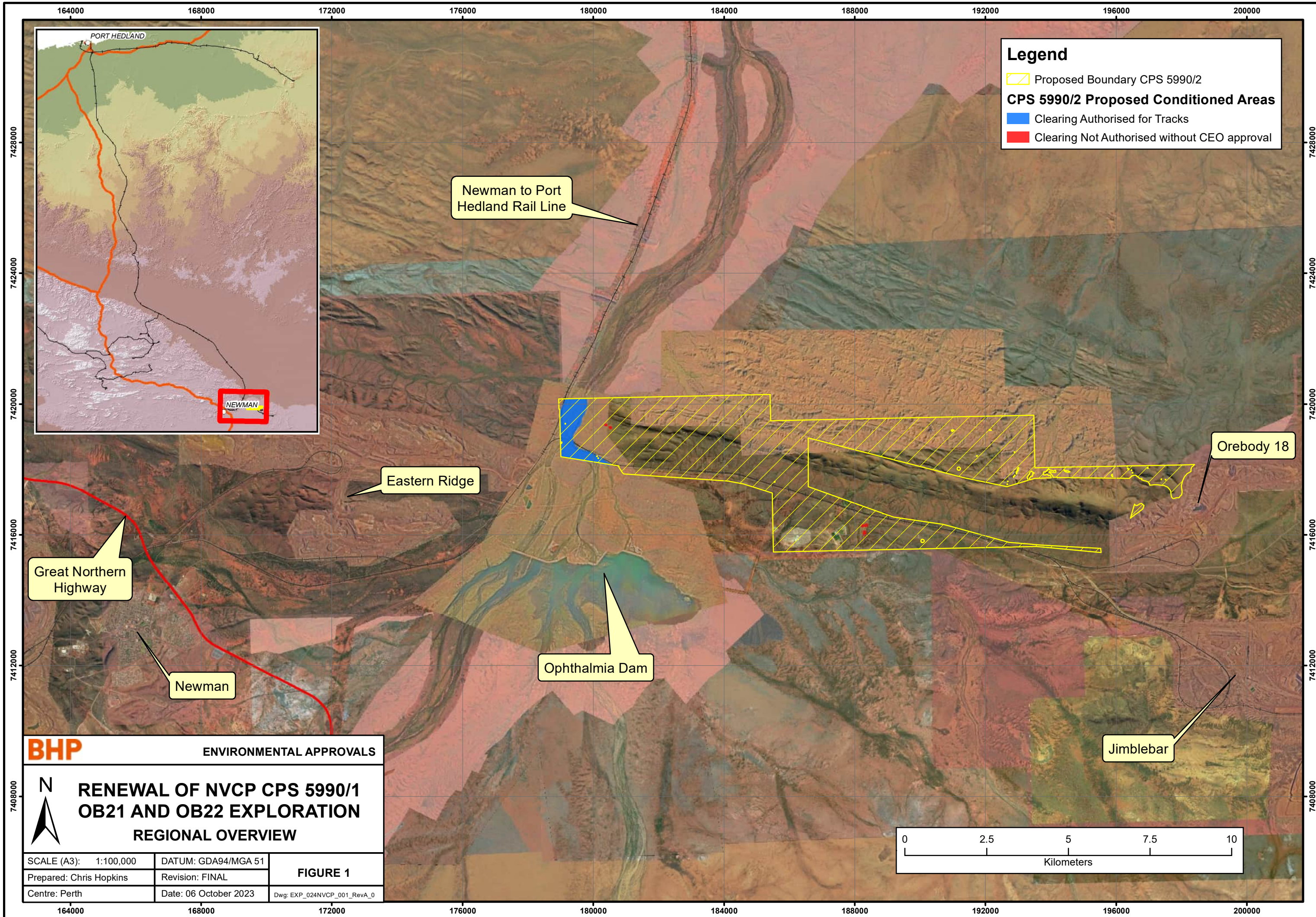
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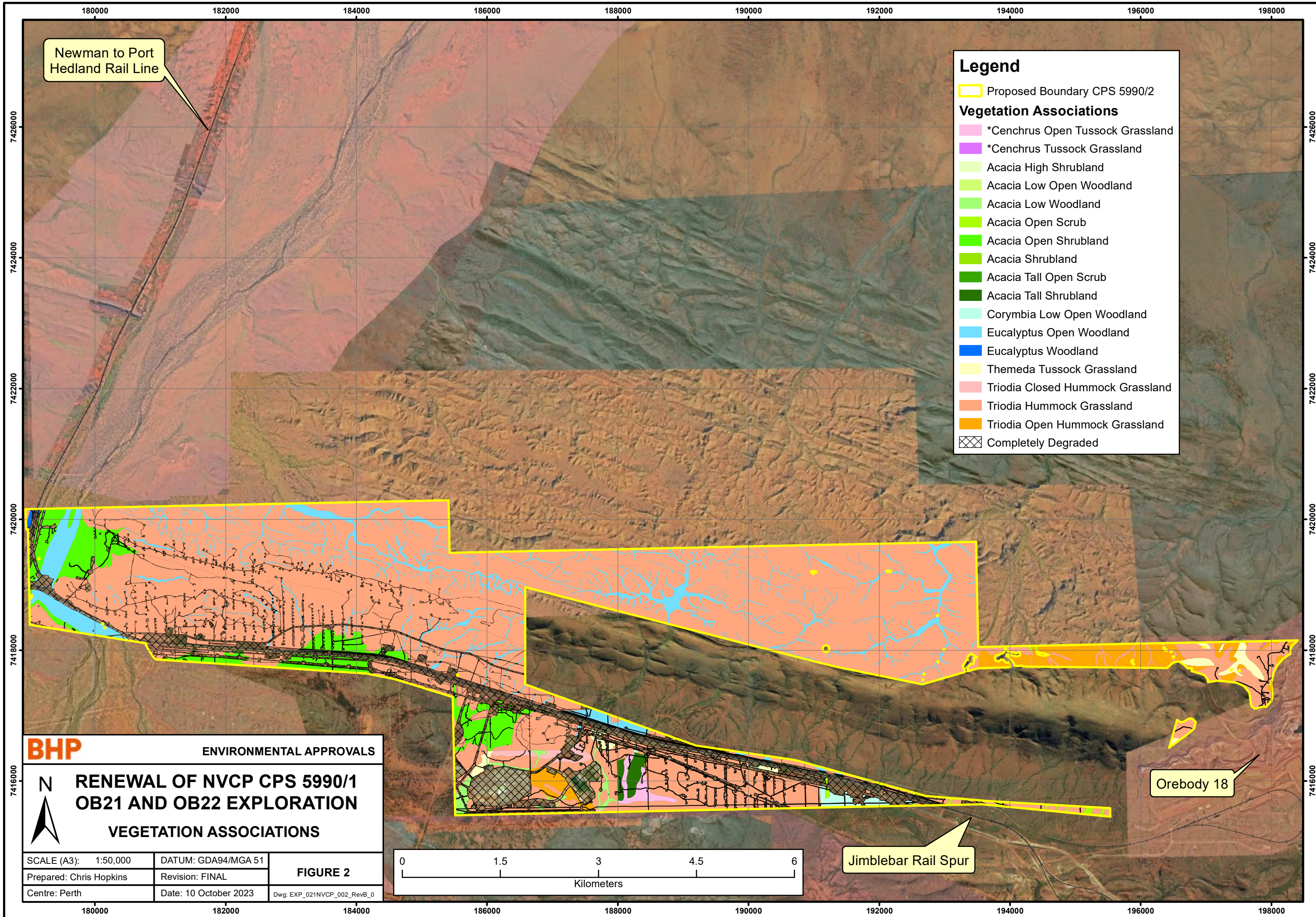
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Figures





Newman to Port Hedland Rail Line

Legend

Proposed Boundary CPS 5990/2

Vegetation Associations

- *Cenchrus Open Tussock Grassland
- *Cenchrus Tussock Grassland
- Acacia High Shrubland
- Acacia Low Open Woodland
- Acacia Low Woodland
- Acacia Open Scrub
- Acacia Open Shrubland
- Acacia Shrubland
- Acacia Tall Open Scrub
- Acacia Tall Shrubland
- Corymbia Low Open Woodland
- Eucalyptus Open Woodland
- Eucalyptus Woodland
- Themeda Tussock Grassland
- Triodia Closed Hummock Grassland
- Triodia Hummock Grassland
- Triodia Open Hummock Grassland
- Completely Degraded

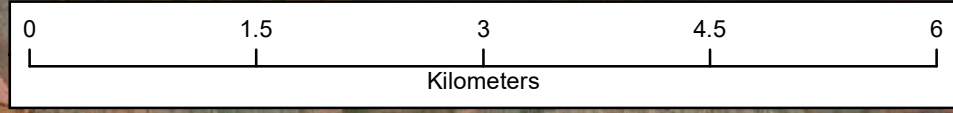
BHP ENVIRONMENTAL APPROVALS

**RENEWAL OF NVCP CPS 5990/1
OB21 AND OB22 EXPLORATION**

VEGETATION ASSOCIATIONS

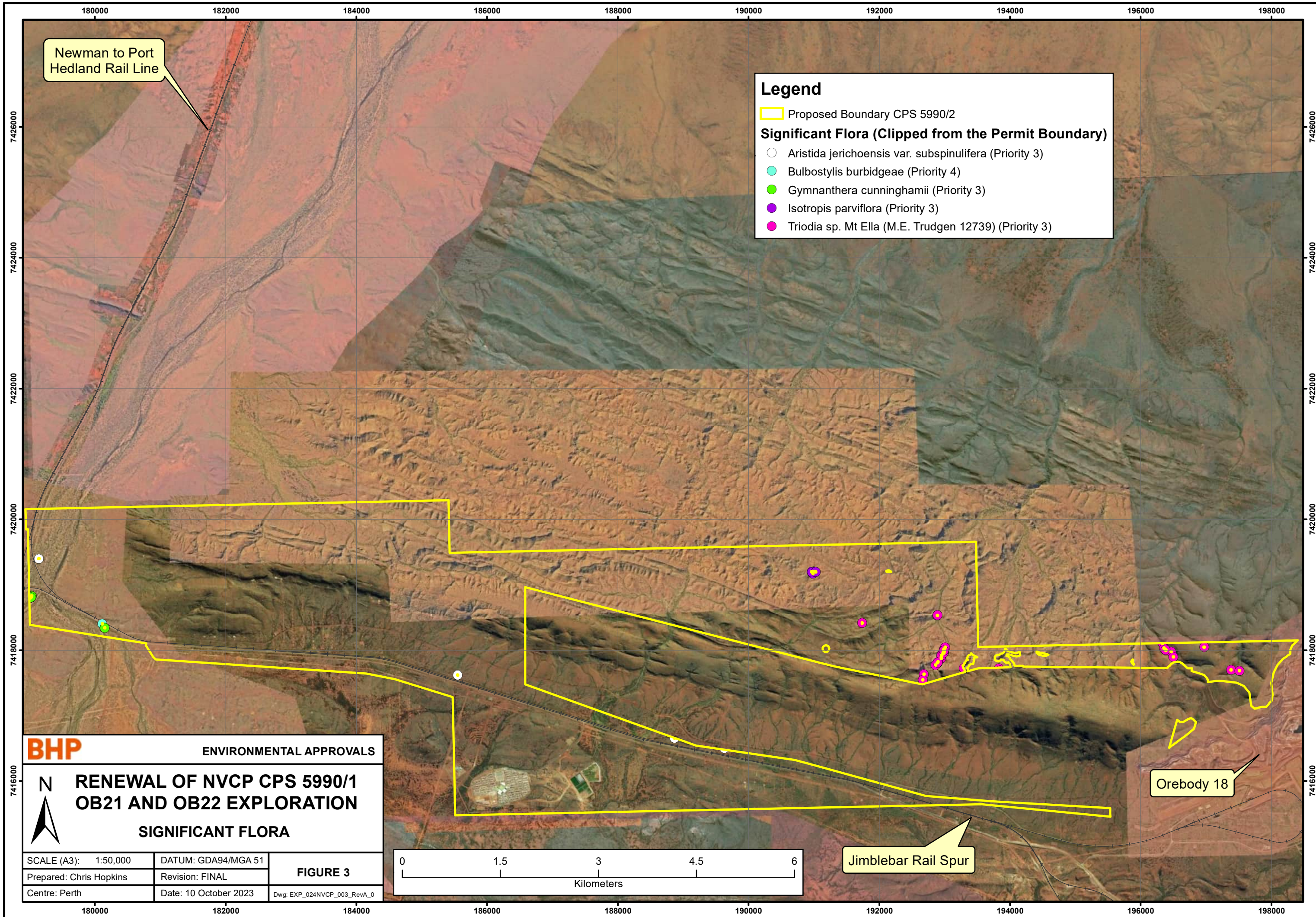
SCALE (A3): 1:50,000	DATUM: GDA94/MGA 51	FIGURE 2
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 10 October 2023	

Dwg: EXP_021NVCP_002_RevB_0



Jimblebar Rail Spur

Orebody 18



Legend

Proposed Boundary CPS 5990/2

Significant Flora (Clipped from the Permit Boundary)

- Aristida jerichoensis* var. *subspinulifera* (Priority 3)
- Bulbostylis burbidgeae* (Priority 4)
- Gymnanthera cunninghamii* (Priority 3)
- Isotropis parviflora* (Priority 3)
- Triodia* sp. Mt Ella (M.E. Trudgen 12739) (Priority 3)

Newman to Port Hedland Rail Line

Orebody 18

Jimblebar Rail Spur

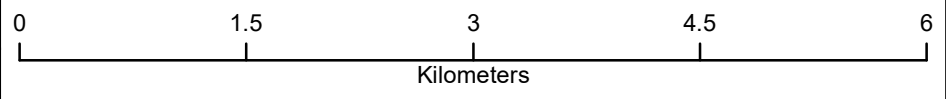
BHP ENVIRONMENTAL APPROVALS

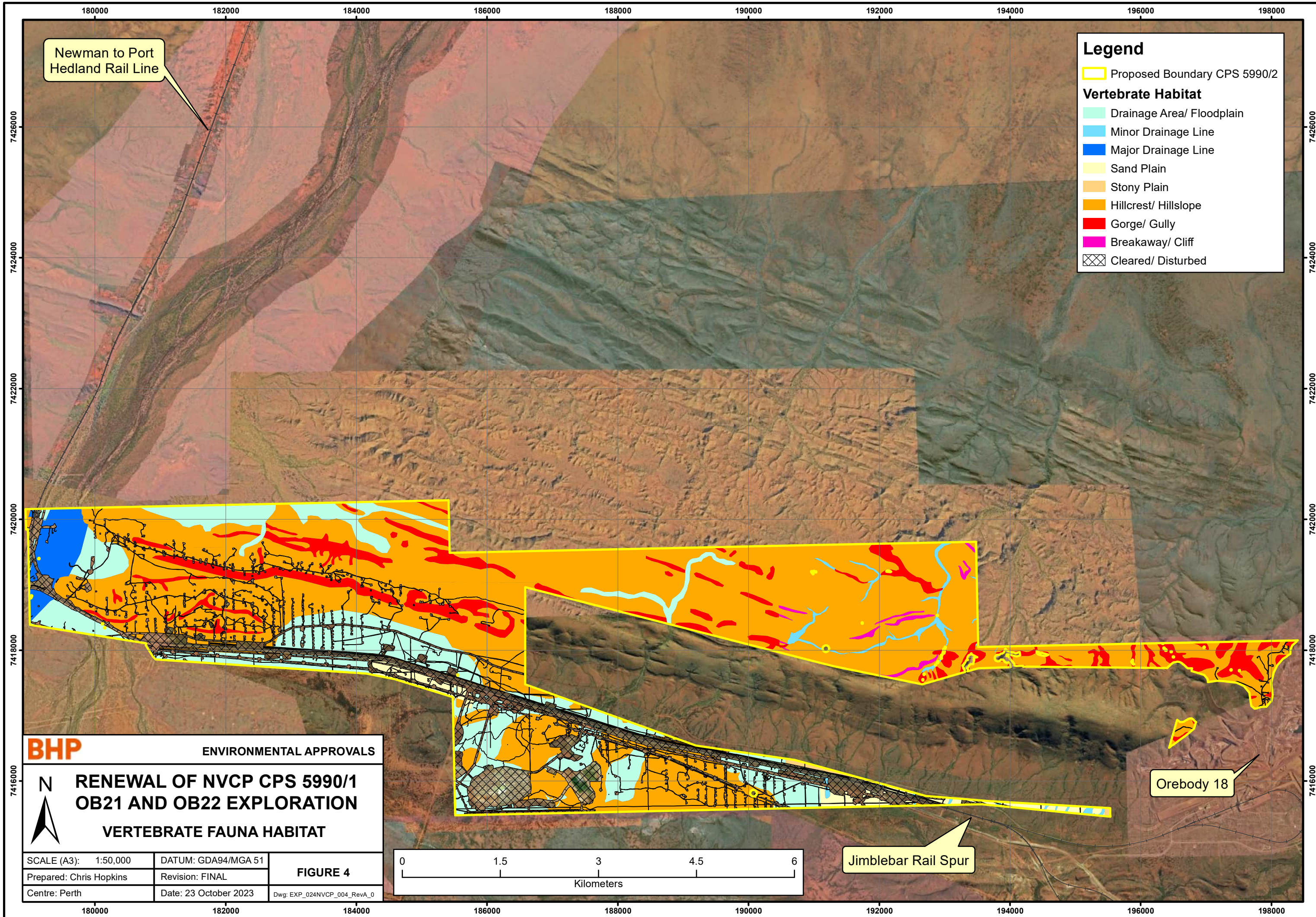
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OB21 AND OB22 EXPLORATION**

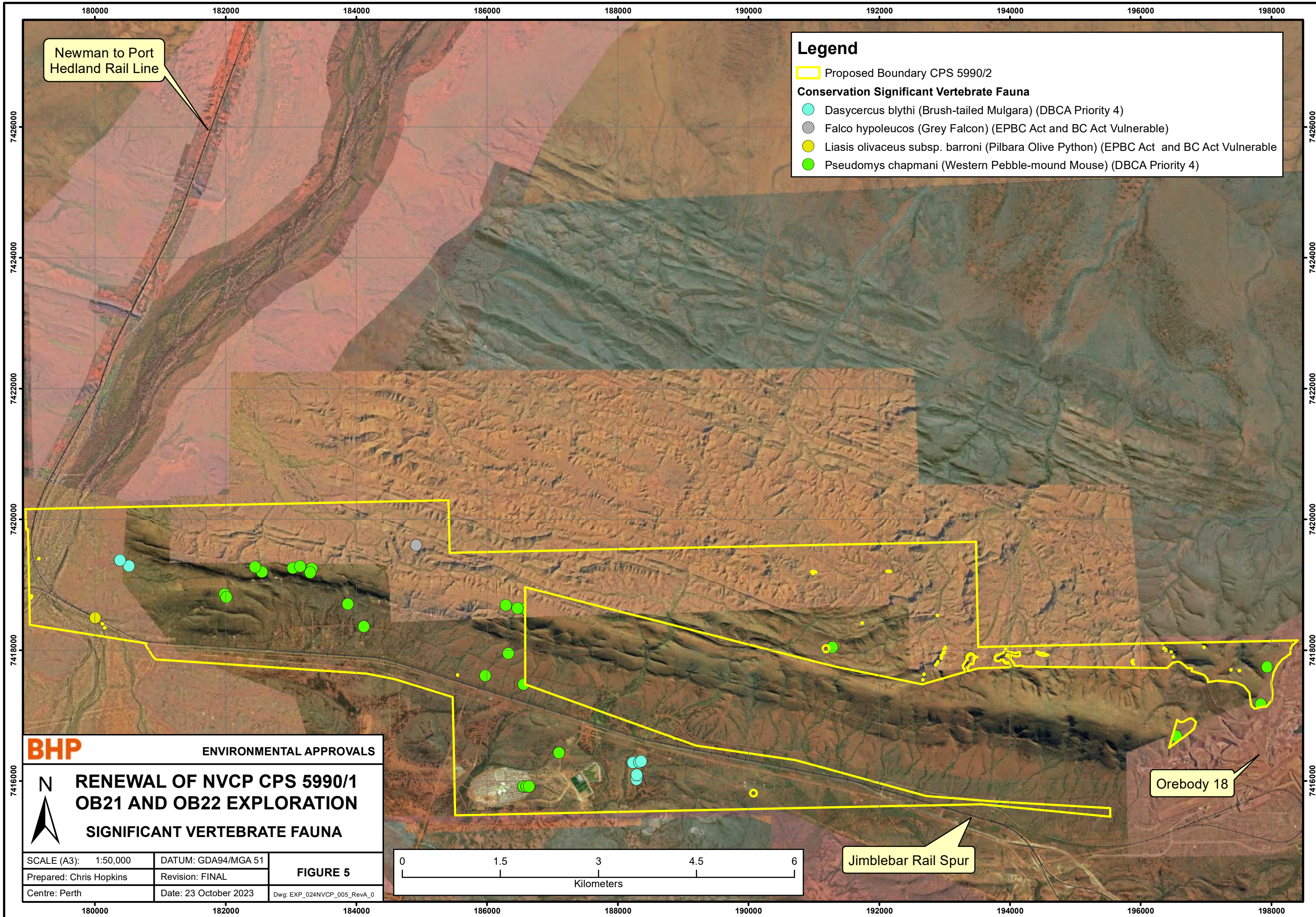
SIGNIFICANT FLORA

SCALE (A3): 1:50,000	DATUM: GDA94/MGA 51	FIGURE 3
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 10 October 2023	

Dwg: EXP_024NVCP_003_RevA_0







Appendices

Appendix 1: East Ophthalmia & Ninga Detailed Flora & Vegetation Survey (Spectrum Ecology and Spatial, 2022)

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

Appendix 3: Ninga Flora and Vegetation Assessment (Astron, 2013)

**Appendix 4: Targeted Survey for *Acacia* sp. East Fortescue (surrounding OB31)
(Onshore Environmental, 2015)**

**Appendix 5: BHP WAIO Jimblebar *Eremophila capricornica* Targeted Flora Survey
(Biologic, 2021)**

Appendix 6: Consolidated Fauna Habitat Mapping 2017 (Biologic Environmental Survey, 2017)

Appendix 7: Jimblebar Targeted Ghost Bat Survey (GHD, 2020)

Appendix 8: OB19 Vertebrate Survey (Biologic, 2014)

Appendix 9: Ninga Vertebrate Fauna Assessment (Eco Logical, 2013)