Application for a new NVCP: Yarrie Contaminated Sites Investigation

Native Vegetation Clearing Permit Application Supporting Document

July 2025



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Appendix 3: *Callawa Level 2 Vertebrate Fauna Assessment* (Eco Logical, 2012)

1 INTRODUCTION

BHP 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 has identified the need to undertake a series of contaminated sites investigations south of the Yarrie Mining Operations.

BHP is therefore seeking a new Native Vegetation Clearing Permit (NVCP) to allow for the clearing of up to 10 hectares (ha) of native vegetation for the purposes of contaminated sites investigations, remediation and associated activities (**Figure 1**).

In accordance with Part V Division 2 of the *Environmental Protection Act 1986* (EP Act), BHP hereby refers the application for a new NVCP to the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS).

BHP considers that the proposed 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 Application Area is located approximately 180 km east of Port Hedland km northwest of in the Pilbara region of Western Australia (**Figure 1**).

1.2 TENURE

The Application Area is located on Mining Leases:

- M263SA
- M45/558
- M45/1016-I

1.3 LOCAL GOVERNMENT JURISDICTION

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

1.4 PROPONENT

The Project is managed and operated by BHP Iron Ore under the *Iron Ore (Goldsworthy-Nimingarra) Agreement Act 1972* on behalf of the owners the Mount Goldsworth 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 8%
- Mitsui Iron Ore Corporation Pty Ltd 7%

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 contaminated sites investigations, remediation 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	DEMIRS
Permit Title	Yarrie Contaminated Sites Investigation
Area to be cleared	10 hectares
Application Area:	156.93 hectares
Purpose of the permit	Clearing for the purposes of contaminated sites investigations, remediation and associated activities
Tenure	Mining Leases: • M263SA • M45/558 • M45/1016-I
Clearing Duration	Until 30 November 2030
Permit Duration	Until 30 November 2035
Proposed Annual Reporting Date	01 October for the previous Financial Year
Proposed Final Reporting Date	Prior to the 30 November 2035
Application boundary	Map Reference: • YAR_009NVCP_001_RevA_0 • YAR_009NVCP_002_RevA_0 • YAR_009NVCP_003_RevA_0 BHP Shapefile D2 Reference: https://waio-dctm.bhp.com/D2/?docbase=bhpbio_od_prod&locateId=0b03c41a84d7a948&application=ManagedDocuments

Application Commitments	**Section**
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
If identified, active Mulgara burrows will be avoided using a 10 m buffer, where practicable	3.4.4 6.2
Western Pebble-mound Mouse mounds will be avoided using a 10 m buffer, where practicable.	3.4.4 6.2
The contaminated sites investigation is predominantly focused on potential contamination within these drainage lines and therefore clearing will be undertaken for soil sampling and bores within these areas. Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage lines. 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
Any potentially acid soil material disturbed will remain in-situ and will be managed to prevent further spread as a result of any activities conducted under this application	6.7

2 ASSOCIATED APPROVALS

Any other additional approvals will be sought as required.

3 EXISTING ENVIRONMENT

3.1 CLIMATE

Port Hedland Airport (meteorological site 004032) is the closest Bureau of Meteorology (BoM) station to the Application Area.

Average annual rainfall at Port Hedland Airport is 315.6 mm with a dry season (mean monthly rainfall <5 mm) between August and November and a wet season (mean monthly rainfall between 53.6 mm and 90.5 mm) between January and March (BoM, 2025). The highest and lowest annual rainfall recorded for Port Hedland was 713.2 mm (recorded in 2013) and 44.5 mm (recorded in 1944), respectively (BoM, 2025). The highest ever recorded daily rainfall for Port Hedland was recorded on 27 January 1967 with 387.1 mm (BoM, 2025) which is 71.5 mm over the current mean annual rainfall for Port Hedland.

The mean maximum temperatures in summer months (October to April) is 35.2°C to 36.8°C, and mean maximum temperatures in winter (May to September) are between 27.4°C and 32.5°C at Port Hedland Airport (BoM, 2025).

Mean daily evaporation at Port Hedland throughout the year is 9 mm/day (BoM, 2025a), which equates to 3.28 metres per year. Evaporation greatly exceeds rainfall in the region throughout the year and on a month-by-month basis (BoM, 2025).

3.2 BIOREGION, LANDFORMS AND LAND SYSTEMS

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

- Chichester subregion: “Northern section of the Pilbara Craton. Undulating Archaean granite and basalt plains include significant areas of basaltic ranges. Plains support a shrub steppe characterised by Acacia inaequilatera over Triodia wiseana (formerly Triodia pungens) hummock grasslands, while Eucalyptus leucophloia tree steppes occur on ranges. The climate is Semi-desert-tropical and receives 300 mm of rainfall annually. Drainage occurs to the north via numerous rivers (e.g. De Grey, Oakover, Nullagine, Shaw, Yule, Sherlock).” (Kendrick, 2001).

The 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 m. A common system in shallow valleys below hill systems such as Newman and Rocklea.”
- Capricorn: “Prominent strike ridges and ranges (relief up to 180 m) of sandstone and other sedimentary rocks with steep slopes and skeletal soils.”
- Macroy: “Level to gently undulating stony and gritty surfaced plains with occasional granite tor fields and domes and closely to moderately spaced dendritic tributary drainage floors, relief up to 25 m. The fourth largest land system (7.2% of the survey area) widespread in the north and centre.”

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 soil type occurs within the Application Area (CSIRO, 2021):

- My54: “Broad very gently undulating plains with scattered rock outcrops occurring as mesas: chief soils are neutral and acid red earths (Gn2.12, Gn2.11), with some hard red soils occurring on pediments of unit Oc61.”

3.4 FLORA, VEGETATION AND FAUNA

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

- *Yarrie Southern Area Biological Survey* (Biota, 2025) (**Appendix 1**); and
- *Level 2 Flora and Vegetation Survey - Callawa* (Onshore, 2013) (**Appendix 2**)

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

- *Yarrie Southern Area Biological Survey* (Biota, 2025) (**Appendix 1**);
- *Callawa Level 2 Vertebrate Fauna Assessment* (Eco Logical, 2012) (**Appendix 3**).

3.4.1 Vegetation Communities

The Application Area is located within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA). According to the Government of Western Australia (2013), this bioregion is more than 99% vegetated (**Table 2**). The vegetation within the Application Area is classified as the following vegetation associations, as mapped by Beard (1975):

- 93: Hummock grasslands, shrub steppe; kanji over soft spinifex;

There is more than 99% of the pre-European vegetation remaining of this vegetation association (**Table 2**). The 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 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 93 in Western Australia	3,044,293	3,040,639	99.88	0.44
Vegetation association 93 within Pilbara IBRA Bioregion	3,042,114	3,038,471	99.98	0.44

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

Table 3: Vegetation associations of the Application Area (Biota, 2025 and Onshore 2013)

Broad Floristic Formation	Vegetation Association Description	
Acacia closed scrub	4	Closed Scrub of *Acacia tumida* var. *pilbarensis* with Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana* and Open Hummock Grassland of *Triodia epactia* in brown loamy sand on drainage lines and drainage flats.
Acacia low open heath	SA AstApty Te	Low open heath of *Acacia stellaticeps*, *A. ptychophylla* over very open to open hummock grassland of *Triodia epactia* on dark reddish brown sandy loam sand plains and drainage areas/floodplains.
Acacia open scrub	SA Aanc Te Ch Ast	Open scrub of *Acacia ancistrocarpa* with very open hummock grassland of *Triodia epactia* with scattered low trees of *Corymbia hamersleyana* and low scattered shrubs of *Acacia stellaticeps* on dark reddish brown sandy loam sand plains.
Corymbia low woodland	ME Cfl AtpAcoc CcCs Cyv	Low woodland of *Corymbia flavescens* over a high shrubland of *Acacia tumida* var. *pilbarensis*, *A. colei* var. *colei* with very open tussock grassland of **Cenchrus ciliaris* and **C. setiger* and very open sedges of *Cyperus vaginatus* on dark reddish brown sandy clay loam in medium drainage lines and drainage areas/floodplains.
Triodia closed hummock grassland	7e	Closed Hummock Grassland of *Triodia epactia* over Low Shrubland of *Acacia stellaticeps* and High Open Shrubland of *Acacia tumida* var. *pilbarensis*, *Acacia colei* and *Acacia inaequilatera* in orange brown loam on sand plains.
Triodia hummock grassland	8b	Hummock Grassland of *Triodia epactia* and *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera*, *Grevillea pyramidalis* and *Grevillea wickhamii* and Low Open Shrubland of *Acacia ptychophylla* in brown sandy loam on footslopes and stony rises.
	SP TeTw Ch Ai	Hummock grassland of *Triodia epactia*, *T. wiseana* with scattered low trees of *Corymbia hamersleyana* and scattered tall shrubs of *Acacia inaequilatera* on reddish brown sandy clay loam on stony footslopes, low undulating hills and stony plains.
Triodia open hummock grassland	MI Te Atp Ch	Open hummock grassland of *Triodia epactia* with high open shrubland of *Acacia tumida* var. *pilbarensis* and low open woodland of *Corymbia hamersleyana* in dark reddish brown sandy clay loam in minor drainage lines.

The distinct mapped broad floristic communities and vegetation associations identified within 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 Application Area were affiliated with any TECs or PECs and there are no vegetation associations within the Application Area that would be likely to be included in any updates to TEC or PEC listings.

Vegetation condition within the Application Area ranges from Excellent to 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) or as Priority Flora by the Department of Biodiversity Conservation and Attractions (DBCA) were identified within the Application Area.

3.4.3 Weeds

Nine introduced flora species (weeds) have been recorded within the 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 Application Area

Species	Common Name	DPAW Rating (DPAW, 2016)	Declared Pest[1]
**Aerva javanica*	Kapok Bush	High and Rapid	No
**Calotropis procera*	Sodam Apple	Not listed	Yes
**Cenchrus ciliaris*	Buffel Grass	High and Rapid	No
**Cenchrus setiger*	Birdwood Grass	High and Rapid	No
**Chloris virgata*	Feathertop Rhodes Grass	High and Rapid	No
**Cynodon dactylon*	Couch	High and Rapid	No
**Echinochloa colona*	Awnless Barnyard Grass	High and Rapid	No
**Malvastrum americanum*	Spiked Malvastrum	High and Rapid	No
**Vachellia farnesiana*	Mimosa Bush	High and Rapid	No

3.4.4 Fauna Habitats and Significant Fauna

Biota (2025) and Eco Logical (2012) identified the following four vertebrate fauna habitats within the Application Area (**Figure 3**):

- **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 understorey dominated by *Triodia* hummock grasses and/or mixed tussock grasses on alluvial substrates, often comprising heavy clays and gravel.
- **Minor Drainage Line**: Minor drainage lines with dark reddish brown sandy clay loam creek beds, fringed by low open woodland of *Corymbia* spp. over high open shrubland of *Acacia tumida* var. *pilbarensis* over open hummock grassland of *Triodia epactia*.
- **Sand Plain**: Scattered low trees of *Corymbia hamersleyana* over low shrubland of *Acacia stellaticeps* with a small area of *A. ancistrocarpa* over open hummock grassland of *Triodia epactia* on dark reddish brown sandy loam plains.
- **Stony Plain**: Scattered low trees of *Corymbia hamersleyana* and *C. opaca* over scattered tall shrubs of *Acacia inaequilatera* and *Grevillea wickhamii* over hummock grassland of *Triodia epactia* and *T. wiseana* on reddish brown sandy clay loam on stony footslopes, low stony hills and stony plains.

[1] BAM Act s22

The surveys undertaken across the Application Area has resulted in two fauna species of significance being recorded from within the Application Area (**Figure 3**):

- Northern Quoll (*Dasyurus hallucatus*) (Endangered EPBC Act and BC Act) (scatt); and
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (Priority 4 DBCA) (Inactive mounds only).

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

- Brush-tailed Mulgara *(Dasycercus blythi*) (Priority 4 DBCA);
- Fork-tailed Swift (*Apus pacificus*) (Migratory EPBC Act and BC Act);
- Ghost Bat (*Macroderma gigas*) (Vulnerable EPBC Act and BC Act);
- Peregrine falcon (*Falco hypoleucos*) (Other Specially Protected Fauna BC Act);
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (Vulnerable EPBC Act and BC Act). and
- Pilbara Olive Python (*Liasis olivaceus* subsp. *barroni*) (Vulnerable EPBC Act and BC Act).

An assessment of the potential impact of the proposed clearing on the species of significant fauna that may occur in the Application Area is provided in **Table 5**.

Table 5: Significant Fauna Potentially Occurring within the Application Area (Biota, 2015; biologic, 2023)

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Birds					
Fork-tailed Swift (*Apus* pacificus)	Migratory EPBC Act Migratory 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 high above the Application Area in the summer months, associated with thunderstorms and cyclonic systems (Johnstone and Storr, 1998). It usually occurs in flocks of up to 2000 and is often seen accompanying Tree Martins and Masked Wood swallows (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 Application Area.	Possible	**Negligible** The Fork-tailed Swift is entirely aerial and not reliant on terrestrial habitats, therefore the impact to this species is considered to be negligible.
Peregrine Falcon (*Falco peregrine*)	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).	This species has been recorded adjacent to the Application Area. It is possible that this species could forage across the Application Area., however there is no suitable breeding habitat located within the boundary.	Possible	**Low** This species is highly mobile with large home ranges and therefore able to easily move away from disturbance. This species may forage within the Application Area, however, no suitable nesting habitats were recorded, so impacts on breeding activity to these species are negligible. In addition, there are large amounts of suitable foraging and nesting habitat for this species outside of the Application Area.
Mammals					
Brush-tailed Mulgara (*Dasycercus blythi*)	Priority 4 (DBCA)	Brush-tailed mulgaras occur in a range of vegetation types, however, the principal habitat is mature hummock grasslands of spinifex, especially *Triodia basedowii* and *T. pungens* (Masters, 2008). Note: Woolley, et. al. (2013) noted that the Crest-tailed Mulgara (*Dasycercus cristicauda*) is unlikely to occur within the Pilbara.	Sandplain habitats of the Application Area represent suitable habitat for this species. Sandplains are present within and adjacent to the Application Area. There are multiple records of the Brush-tailed Mulgara in the broader region.	Possible	**Low** While this species may forage within the Application Area, impacts are expected to be low given this species' key habitat (Sand Plain) is extensive adjacent to the Application Area and the broader region and the minimal disturbance associated with the Project. If identified, active Mulgara burrows will be avoided using a 10 m buffer, where practicable.
Ghost Bat (*Macroderma gigas*)	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 *et al*. 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 Ghost Bats have not been recorded from the Application Area, they may forage over the Application Area as they have been recorded in the broader region. There are no caves or key habitat for this species within the Application Area.	Possible	**Low** This species may forage across the Application Area and its surrounds. No suitable roosting habitat has been identified within the Application Area and therefore the Ghost Bat is unlikely to be dependant on the habitats present within the Application Area.
Northern Quoll (*Dasyurus hallucatus*)	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 has been a single record of the Northern Quoll within the north of the Application Area. Key habitat for this species is not present in the Application Area however given this species has been recorded throughout the broader region it is likely to forage into the Application Area from the breakaway habitat north of the Application Area.	Recorded	**Low** This species may forage across the Application Area and its surrounds from the breakaway habitat to the north of the Application Area.. No key habitat for this species has been identified within the Application Area and therefore the Northern Quoll is unlikely to be dependant on the habitats present within the Application Area.
Pilbara Leaf-nosed Bat (*Rhinonicteris aurantius*)	Vulnerable EPBC Act Vulnerable BC Act	The Pilbara Leaf-nosed Bat is a poor thermoregulators and 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 Pilbara Leaf-nosed Bat have not been recorded from the Application Area, they may forage over the Application Area as they have been recorded in the broader region. There are no suitable caves within the Application Area however it is likely that this species may forage over the Application Area.	Possible	**Low** This species may forage over the habitats within the Application Area and surrounds. No suitable roosting habitat has been identified within the Application Area and therefore the Pilbara Leaf-nosed Bat would not be dependant on the habitats present within the Application Area.
Western Pebble-mound Mouse (*Pseudomys chapmani*)	Priority 4 DBCA	The Western Pebble-mound Mouse is restricted to the Pilbara, 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 Stony Plain habitat provides suitable habitat for this species. There are extensive areas of suitable habitat (Hill Crest / Slope and Stony Plain habitats) for this species within (stony Plan only) and adjacent to the Application Area. Nine inactive and no active mounds have been identified in the Application Area. Western Pebble-mound Mouse mounds will be avoided using a 10 m buffer, where practicable.	Recorded	**Low** While the Stony Plain habitats of the Application Area may be 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. There are large areas of suitable habitat for this species adjacent to the Application Area. Western Pebble-mound Mouse mounds will be avoided using a 10 m buffer, where practicable.
Reptiles					
Pilbara Olive Python (*Liasis olivaceus barroni*)	Vulnerable (EPBC Act) Vulnerable BC Act	Pilbara Olive Python are widespread across the Pilbara, with many significant populations remaining (Pearson, 2003). The Pilbara Olive Python is found in a range of habitats, including drier areas of woodland, escarpments, rocky gorges, gullies and around watercourses (Wilson and Swan, 2010). This species is known to den/ shelter in rocky crevices or tree hollows and are often associated with areas containing watercourses. The Pilbara Olive Python uses drainage line habitat to forage and disperse throughout the landscape.	This species is known from the broader region and may utilize the Minor Drainage Line habitat of the Application Area for foraging and dispersal.		**Low** While this species has not been recorded within the Application Area it is possible that it may be a transitory visitor to the Minor Drainage Line habitat of the Application Area. The Pilbara Olive Python is unlikely to be reliant on the habitat within the Application Area.

3.5 GROUNDWATER

The 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 Application Area:

- Pilbara Fractured Rock which is described as: "The Pilbara fractured rock aquifer consists of Precambrian granite-greenstone terrain overlain by surficial sediments in the river valleys. The water table is generally within 5 to 10 metres of the surface in the granitic areas, but may be quite deep below the greenstone hills. The major aquifers within these rocks are quartz veins, and chert layers. Groundwater is mainly fresh, ranging up to brackish towards the coast. Bore yields vary depending on intersection of fractures. Marble Bar town water supply is drawn from bores in acid volcanic rocks. Nullagine's town water supply is drawn from both shallow alluvium (less than 12 m deep) and fractured sandstones. Water has also been produced by dewatering from the iron ore mines in the Goldsworthy-Shay Gap-Yarrie area. There are not considered to be any major regional groundwater resources in the Pilbara fractured rock. Development will be on a local basis principally for mining and town water supply. Pastoral bores intercept both the fractured rock and the overlying weathered zone (DoW, 2015)."

3.6 SURFACE WATER

The 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 south across the Application Area.

The contaminated sites investigation is predominantly focused on potential contamination within these drainage lines and therefore clearing will be undertaken for soil sampling and bores within these areas. Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage lines. 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 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 Application 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 Global Documents 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 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 Application Area is located outside the 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 Application Area.

No Priority Flora species listed by the DBCA have been recorded in the Application Area (**Section 3.4.2**).

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 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 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 Application Area is in a similar 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 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 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 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.	No Priority flora species have been recorded in the Application Area.	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 four broad vertebrate fauna habitat types within the Application Area (**Figure 3**).

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

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

Table 7 provides an assessment of the proposed clearing activities within the 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.	One BC Act protected species have been recorded from the Application Area and five BC Act protected species are considered 'possible' or 'likely' to occur within the Application Area (**Table 5**). The proposed activities are unlikely to have a significant impact on these species as: • All species are wide-ranging and found throughout the broader region; • There are no key habitat features (caves and waterhole habitats) within the Application Area; • All species are only likely to forage within or be transient visitors to the Application Area; • These species do not exclusively depend on any habitat type or feature within the Application Area; and • Similar habitat is well represented outside the Application Area.>	Unlikely to be 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.	One Priority fauna species has been recorded within the Application Area with one other considered 'possible' or 'likely' to occur within the Application Area. As detailed in **Table 5** these species are unlikely to be impacted for the following reasons: • The preferred habitat for these species is well represented outside the Application Area; • Similar habitat within close vicinity to the Application Area was found to be the same or better condition than that of the Application Area; • If identified, active Mulgara burrows will be avoided using a 10 m buffer, where practicable. • Western Pebble-mound Mouse mounds 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 Application Area may be suitable for use by conservation significant fauna, however similar habitat in the same or better condition is widespread in the 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 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 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.
	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 Application Area that are necessary for the maintenance of fauna.	Not at variance with clearing principle.

Principle	Criteria	Assessment	Outcome
	b7) Native vegetation should not be cleared if it provides significant habitat for fauna communities (assemblages) and meta-populations.	The Application Area is not considered to contain significant habitat for faunal assemblages that are not also present in other areas within the vicinity. The 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 Application Area.

Table 8 provides an assessment of the proposed clearing activities within the 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 *in situ* existence of populations of Declared Rare Flora under the *BC Act 2016*	No Threatened flora species were recorded in the Application Area.	Not at variance with clearing principle.
	c2) Native vegetation should not be cleared if it is necessary for the continued *in situ* existence of other significant flora.	No species listed under the EPBC Act or other significant flora species were recorded in the 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 proposed permit are associated with a TECs or PECs. The closest PEC Gregory Land System (Priority 3) is approximately 45 km northwest of the Application Area (**Section 3.4.1**).

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

Table 9: Assessment against Principle D components

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

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 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 Application Area.

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

Table 10: Assessment against Principle E components

Principle	Criteria	Assessment	Outcome
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.	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).	Clearing native vegetation within the Application Area will not reduce the extent of native vegetation below 30% in the bioregion or subregion.	Not at variance with clearing principle.
	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).	Clearing native vegetation within the 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.	Not at variance with clearing principle.
	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)	Clearing native vegetation within the Application Area will not significantly reduce the known extent of the vegetation community in the bioregion.	Not at variance with clearing principle.
	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.	Clearing native vegetation within the Application Area will not reduce the representation of remaining native vegetation to less than 30% in the local area.	Not at variance with clearing principle.
	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.	Clearing native vegetation within the Application Area will not reduce the representation of any ecological community to less than 30% of its original extent in the local area.	Not at variance with clearing principle.
	e6) Native vegetation should not be cleared if clearing would reduce any ecological community to less than 1% of the Local Area.	Clearing native vegetation within the Application Area will not significantly reduce the known extent of the vegetation community in the local area.	Not at variance with clearing principle.

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 south across the Application Area.

The contaminated sites investigation is predominantly focused on potential contamination within these drainage lines and therefore clearing will be undertaken for soil sampling and bores within these areas. Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage lines. 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 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.	No permanent watercourses or wetlands are located within with the Application Area. There are multiple non-perennial drainage lines that flow predominately to the south across the Application Area. The contaminated sites investigation is predominantly focused on potential contamination within these drainage lines and therefore clearing will be undertaken for soil sampling and bores within these areas. Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage lines. 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.	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).	No permanent watercourses or wetlands are located within with the Application Area. There are multiple non-perennial drainage lines that flow predominately to the south across the Application Area. The contaminated sites investigation is predominantly focused on potential contamination within these drainage lines and therefore clearing will be undertaken for soil sampling and bores within these areas. Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage lines. 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.	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 and purpose 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.	Unlikely at variance with clearing principle.
	f4) Native vegetation should not be cleared if it is growing in other watercourses or wetlands.	No permanent watercourses or wetlands are located within the Application Area.	Unlikely 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 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 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 Application Area or adjacent areas.

6.7.2 Changes to pH

The proposed contaminated sites investigation is to identify the extent of potential impacts of AMD from existing waste rock stockpiles at Yarrie. The clearing associated with the contaminated sites investigation will not result in an increase in the risk of run off from the waste rock stockpile, nor 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

Nine introduced flora species have been recorded in the (**Table 4**). One species, **Calotropis procera* (Sodam Apple) is 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
g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	g1) Native vegetation should not be cleared if wind or water erosion of soil is likely to be increased (on or off site).	Soil erosion is not anticipated to occur as any areas cleared will be revegetated where practicable, if not required for infrastructure.	Not considered to be at variance with clearing principle.
	g2) Native vegetation on land with soils with high or low pH should not be cleared.	The Application Area is not considered to contain soils at risk of having acid sulphate soils present. There is a minor risk that some isolated areas within the Application Area may have a significantly low pH as a result of runoff from the Yarrie waste rock dump. Any potentially acid soil material disturbed will remain in-situ and will be managed to prevent further spread as a result of any activities conducted under this application	Not at variance with clearing principle.
	g3) Native vegetation should not be cleared if water logging is likely to be increased (on or off site).	It is not expected that water logging would be increased by the clearing of native vegetation within the Application Area	Not at variance with clearing principle.
	g4) Native vegetation should not be cleared if land salinisation is likely to be increased (on or off site).	Soil salinity is not considered to be increased in the Application Area (on or off site) by the clearing of native vegetation.	Not at variance with clearing principle.

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 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 Mungaroona Range Nature Reserve which is more than 200 km> southwest of the Application Area.

The Application Area is not considered to form an ecological linkage to this conservation area.

An assessment of the proposed clearing activities within the 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 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 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 more than 2220 km south west of the 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 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 unlikely to be at variance to this Principle.

The contaminated sites investigation is predominantly focused on potential contamination within these drainage lines and therefore clearing will be undertaken for soil sampling and bores within these areas.

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.

The contaminated sites investigation is predominantly focused on potential contamination within these drainage lines and therefore clearing will be undertaken for soil sampling and bores within these areas. Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage lines. 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 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 Application Area due to the limited nature of the clearing within the Application Area.	Unlikely to be 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.	Unlikely to be 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 Application Area	Unlikely to be 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 Application Area.	Unlikely to be 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 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* (WA) (AHA), its associated Regulations and Guidelines, as well as all other state and federal heritage legislation. All land access and land disturbance activities are assessed as part of an internal PEAHR. The PEAHR process ensures that all heritage sites in the vicinity of the Project Area are identified and avoided where practicable and that the scope of work for a particular project is permitted within the proposed footprint.

The Application Area falls within the Nyamal Native Title Determination Area (WAD20/2019). Archaeological surveys of the proposed boundary have been undertaken by BHP with Traditional Owners in 1988, 2006, 2011 and 2024; and ethnographic surveys over approximately 50 % of the proposed boundary in 1991, 2006 and 2024. Significant heritage values are located immediately to the north of the project are and have been removed from the scope. No other heritage sites have been identified within the Application Area. Further consultation and surveys will be conducted over any other areas prior to ground disturbance, if required. All heritage sites will be avoided if possible, if any heritage site cannot practicably be avoided, BHP would consult with the Nyamal Aboriginal Corporation and seek approval under the AHA prior to ground disturbance.

8 CONCLUSION

The proposed clearing of up to 10 ha in the 156.93 ha Application Area is unlikely to be at variance to any of the Ten Clearing Principles nor is it likely to have any significant negative impacts on biodiversity and environmental values in the area.

9 REFERENCES

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Figures

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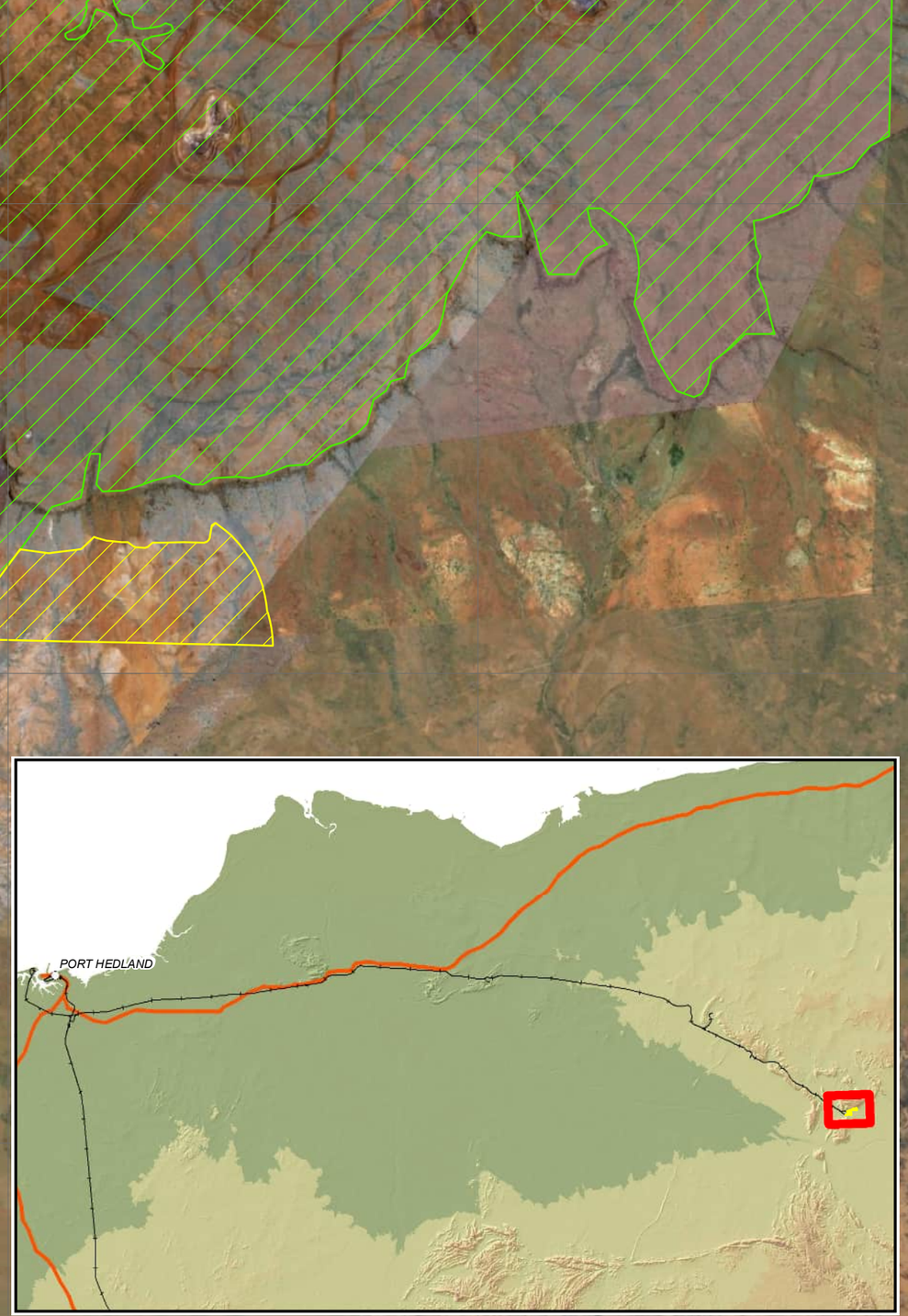
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Yarrie Camp

Yarrie Mining Operations

Goldsworthy Mainline

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Kilometers



BHP ENVIRONMENTAL APPROVALS

N

YARRIE CONTAMINATED SITES INVESTIGATION NVCP

REGIONAL OVERVIEW

SCALE (A3): 1:24,000	DATUM: GDA202/MGA 50	FIGURE 1
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 09 June 2025	Dwg: YAR_009NVCP_001_RevA_0

Legend

- Proposed NewNVCP Boundary
- Yarrie Strategic NVCP CPS 6450/2

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ENVIRONMENTAL APPROVALS

YARRIE CONTAMINATED SITES INVESTIGATION NVCP

VEGETATION ASSOCIATIONS

SCALE (A3): 1:10,000	DATUM: GDA202/MGA 50	FIGURE 2
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 05 June 2025	Dwg: YAR_009NVCP_002_RevA_0

N

0 200 400 600 800
Meters

Y2 OSA

Yarrie Rail Loop

844500 845000 845500 846000 846500 847000 847500 848000

7716500 7716000 7715500 7715000 7714500

Legend

Proposed New NVCP Boundary

Vegetation Associations

- Acacia closed scrub (4)
- Acacia low open heath (SA AstApty Te)
- Acacia open scrub (SA Aanc Te Ch Ast)
- Corymbia low woodland (ME Cfl AtpAcoc CcCs Cyv)
- Triodia closed hummock grassland (7e)
- Triodia hummock grassland (8b)
- Triodia hummock grassland (SP TeTw Ch Ai)
- Triodia open hummock grassland (MI Te Atp Ch)
- Cleared

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ENVIRONMENTAL APPROVALS

YARRIE CONTAMINATED SITES INVESTIGATION NVCP

VERTEBRATE FAUNA HABITAT AND SIGNIFICANT FAUNA

SCALE (A3): 1:10,000	DATUM: GDA202/MGA 50	FIGURE 3
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 05 June 2025	Dwg: YAR_009NVCP_003_RevA_0

N

0 200 400 600 800
Meters

Y2 OSA

Yarrie Rail Loop

844500 845000 845500 846000 846500 847000 847500 848000

7716500 7716000 7715500 7715000 7714500

Legend

Proposed New NVCP Boundary

Significant Fauna Record

- Dasyurus hallucatus (Northern Quoll) (EPBC Act and BC Act Endangered) - Scat
- Pseudomys chapmani (Western Pebble-mound Mouse) (DBCA Priority 4) - Inactive mound

Vertebrate Fauna Habitat

- Drainage Area/ Floodplain
- Minor Drainage Line
- Sand Plain
- Stony Plain
- Cleared/ Disturbed

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Appendices

Appendix 1: *Yarrie Southern Area Biological Survey* (Biota, 2025)

Appendix 2: *Level 2 Flora and Vegetation Survey - Callawa* (Onshore, 2013)

Appendix 3: *Callawa Level 2 Vertebrate Fauna Assessment* (Eco Logical, 2012)