



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6450/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **BHP Billiton Iron Ore Pty Ltd**

1.3. Property details

Property: *Iron Ore (Goldsworthy-Nimingarra) Agreement Act 1972*, Mining Lease 263SA (AM 70/263); *Iron Ore (Goldsworthy-Nimingarra) Agreement Act 1972*, Mineral Lease 251SA (AML 70/251); *Iron Ore (Mount Goldsworthy) Agreement Act 1964*, Mineral Lease 249SA (AML 70/249); *Iron Ore (Mount Goldsworthy) Agreement Act 1964*, Special Lease 3116/6935, Document J998594 L, Lot 42 on Deposited Plan 241586; Mining Leases 45/558, 45/573, 45/592, 45/1016, 45/1018; Exploration Licence 45/1072

Local Government Area: Shire of East Pilbara
Colloquial name: Nimingarra to Yarrie Strategic Exploration Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
444.82		Mechanical Removal	Mineral exploration, geotechnical investigations, hydrogeological drilling, access tracks, rehabilitation, and associated activities.

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 26 March 2015

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped for the whole of Western Australia. Three Beard vegetation associations have been mapped within the application area (GIS Database):

93: Hummock grasslands, shrub steppe; kanji over soft spinifex;
117: Hummock grasslands, grass steppe; soft spinifex; and
171: Hummock grasslands, low tree steppe; snappy gum over soft spinifex and *Triodia brizoides*.

Eight flora and vegetation surveys have been undertaken over the application area by Onshore (2010, 2013, 2013a), Astron (2012, 2014), ENV (2008) and Ecologia (2005, 2005a). These surveys identified 95 vegetation associations within 28 broad floristic communities within the application area (BHP, 2015):

Astron (2012) described 10 broad floristic communities with 27 vegetation associations with the application area:

Melaleuca Low Open Forest

1: Low Open Forest of *Melaleuca argentea* and *Eucalyptus victrix* over Tall Shrubland of *Acacia colei* var. *colei* and *A. trachycarpa* over Very Open Tussock Grassland of **Echinochloa colona* and Very Open Sedgeland of *Fimbristylis littoralis* and *Cyperus conicus*.

Melaleuca Woodland

2: Woodland of *Eucalyptus victrix*, *Melaleuca argentea* and *Ficus aculeata* var. *indecora* over Scattered Tall Shrubs of *Atalaya hemiglauca* and *Ficus aculeata* var. *indecora* over Scattered Hummock Grasses of *Triodia biflora*, Very Open Tussock Grassland of **Chloris barbata*, **Digitaria ciliaris* and **Echinochloa colona* with Scattered Sedges of *Cyperus vaginatus*.

Acacia Low Closed Forest

5: Low Closed Forest of *Acacia colei* var. *colei* and *A. tumida* var. *pilbarensis* over Tall Open Scrub of *A. colei* var. *colei*, *A. tumida* var. *pilbarensis* and *A. synchronicia* over Scattered Hummock Grasses of *Triodia epactia* and *T. biflora*.

Acacia Tall Open Scrub

6a: Low Open Woodland of *Corymbia hamersleyana* and *C. flavescens* over Tall Open Scrub of *Acacia tumida* var. *pilbarensis*, *A. ancistrocarpa*, *A. colei* var. *colei* and *Petalostylis labicheoides* over Low Open Heath of *Acacia stellaticeps* over Open Hummock Grassland of *Triodia epactia* and *T. schinzii* over Very Open Tussock Grassland of *Chrysopogon fallax* and *Paraneurachne muelleri*.

6b: Scattered Low Trees of *Corymbia flavescens* and *C. hamersleyana* over Tall Open Scrub of *Acacia ancistrocarpa* and *Grevillea wickhamii* subsp. *hispidula* over Open Hummock Grassland of *Triodia epactia* with Open Tussock Grassland of *Chrysopogon fallax*.

6c: Scattered Low Trees of *Corymbia hamersleyana* over Tall Open Scrub of *Acacia tumida* var. *pilbarensis* over Low Open Shrubland of *Acacia adoxa* and *A. hilliana* over Hummock Grassland of *Triodia epactia*.

6d: Low Open Woodland of *Corymbia flavescens* and *C. hamersleyana* over Tall Open Scrub of *Acacia ancistrocarpa*, *A. tumida* var. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* over Open Shrubland of *Tephrosia rosea* var. *clementii* over Very Open Hummock Grassland of *Triodia epactia* and *T. schinzii* and Open Hermland of *Bonamia* species.

Acacia Tall Shrubland

7a: Tall Shrubland of *Acacia tumida* var. *pilbarensis* over Open Shrubland of *Petalostylis labicheoides* over Open Hummock Grassland of *Triodia schinzii* and *T. epactia* and Very Open Hermland of *Jasminum didymum* subsp. *lineare*.

7b: Low Open Woodland of *Corymbia hamersleyana*, *C. flavescens* and *Eucalyptus victrix* over Tall Shrubland of *Acacia coleii* var. *coleii* and *A. tumida* var. *pilbarensis* over Low Open Shrubland of *Cajanus cinereus* over Open Hummock Grassland of *Triodia epactia*, *T. biflora* and *T. wiseana* and Very Open Tussock Grassland of *Themeda triandra*.

Acacia Low Open Heath

8a: Low Open Heath of *Acacia stellaticeps*, *A. ptychophylla* and *Indigofera monophylla* over Hummock Grassland of *Triodia wiseana*.

8b: Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia flavescens* over Scattered Tall Shrubs of *Acacia inaequilatera* and *A. ancistrocarpa* over Shrubland of *Acacia adoxa*, *A. hilliana* and *Senna symonii* over Hummock Grassland of *Triodia epactia* and *T. wiseana*.

Triodia Hummock Grassland

10a: Scattered Low Trees of *Corymbia hamersleyana* over Tall Open Shrubland of *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* subsp. *Hispidula* over Low Open Shrubland of *Acacia adoxa* and *A. hilliana* over Hummock Grassland of *Triodia epactia* over Very Open Sedgeland of *Fimbristylis oxystachya* and Scattered Tussock Grasses of *Eriachne mucronata* and *E. lanata*.

10b: Tall Shrubland of *Grevillea wickhamii* subsp. *hispidula* over Low Open Shrubland to Open Heath of *Acacia hilliana* and *A. adoxa* over Hummock Grassland of *Triodia epactia*.

10d: Low Open Woodland of *Corymbia hamersleyana* over Tall Shrubland of *Grevillea wickhamii* subsp. *hispidula* and *Acacia tumida* var. *pilbarensis* over Low Shrubland of *Acacia hilliana*, *A. ptychophylla* and *A. adoxa* over Hummock Grassland of *Triodia epactia*.

10e: Low Open Woodland of *Corymbia hamersleyana* over Tall Open Shrubland of *Grevillea wickhamii* subsp. *hispidula* and *Acacia inaequilatera* over Low Shrubland of *Acacia adoxa* and *A. ptychophylla* over Closed Hummock Grassland of *Triodia epactia* and *T. wiseana*.

10f: Low Open Woodland of *Corymbia flavescens* over Tall Open Shrubland of *Acacia tumida* var. *pilbarensis* and *A. coleii* var. *coleii* over Low Shrubland of *Indigofera monophylla*, *Isotropis atropurpurea* and *Corchorus elachocarpus* over Hummock Grassland of *Triodia epactia* over Scattered Tussock Grasses of *Chrysopogon fallax* and *Sporobolus australasicus*.

10g: Scattered Shrubs of *Petalostylis labicheoides* over Low Shrubland of *Acacia bivenosa*, *A. stellaticeps* and *Corchorus sidoides* subsp. *sidoides* over Hummock Grassland of *Triodia epactia* and *T. angusta*.

10h: Low Open Woodland of *Corymbia hamersleyana* over Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Acacia tumida* var. *pilbarensis* and *A. inaequilatera* over Low Open Heath of *Acacia adoxa* and *A. hilliana* over Hummock Grassland of *Triodia epactia*.

10l: Scattered Low Trees of *Corymbia hamersleyana* over Open Shrubland of *Acacia inaequilatera*, *A. tumida* var. *pilbarensis* and *A. ancistrocarpa* over Hummock Grassland of *Triodia epactia* and *T. wiseana*.

10m: Low Open Woodland of *Corymbia hamersleyana* and *C. flavescens* over Tall Shrubland of *Acacia orthocarpa* and *A. ancistrocarpa* over Low Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Acacia adoxa* and *A. hilliana* over Hummock Grassland of *Triodia epactia* and *T. schinzii* over Scattered Sedges to Very Open Sedgeland of *Fimbristylis oxystachya* and *Cyperus conicus*.

10o: Scattered Low Trees of *Corymbia hamersleyana* over Scattered Tall Shrubs of *Acacia ancistrocarpa* over Open Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Acacia tumida* var. *pilbarensis* and *A. monticola* over Low Open Shrubland of *Acacia hilliana* and *A. adoxa* over Hummock Grassland of *Triodia epactia* with Scattered Tussock Grasses of *Eriachne lanata* over Scattered Sedges of *Fimbristylis oxystachya*.

10p: Tall Open Shrubland of *Acacia tumida* var. *pilbarensis*, *A. inaequilatera* and *A. synchronicia* over Low Open Shrubland of *Acacia hilliana* and *A. adoxa* over Hummock Grassland of *Triodia epactia* and *T. wiseana*.

10r: Low Open Woodland of *Corymbia hamersleyana* over Tall Open Scrub of *Acacia ancistrocarpa*, *A. synchronicia* and *A. tumida* var. *pilbarensis* over Open Heath of *Acacia stellaticeps* over Hummock Grassland of *Triodia epactia*.

10s: Low Open Woodland of *Grevillea pyramidalis* subsp. *leucadendron* and *Acacia inaequilatera* over Open

Shrubland of *Acacia ancistrocarpa*, *A. inaequilatera* and *A. synchronicia* over Hummock Grassland of *Triodia epactia*.

Triodia Open Hummock Grassland

11: Low Woodland of *Corymbia hamersleyana* and *Acacia tumida* var. *pilbarensis* over Low Shrubland of *Tephrosia* sp. Bungaroo Creek, *Acacia adoxa* and *A. stellaticeps* over Open Hummock Grassland of *Triodia epactia* and *T. wiseana*.

Eriachne Tussock Grassland

13: Low Open Shrubland of *Acacia tumida* var. *pilbarensis*, *A. adoxa* and *A. hilliana* over Scattered Low Shrubs of *Hybanthus aurantiacus*, *Goodenia stobbsiana* and *Corchorus sidoides* subsp. *vermicularis* over Tussock Grassland of *Eriachne lanata*.

***Cenchrus Open Tussock Grassland**

14: Low Woodland of *Eucalyptus victrix*, *Corymbia flavescens* and *Atalaya hemiglaucula* over Low Open Shrubland of *Indigofera monophylla*, *Corchorus tectus* and *Tephrosia* sp. D Kimberley Flora (R.D Royce 1848) over Open Tussock Grassland of **Cenchrus ciliaris* and *Chrysopogon fallax* over Very Open Hummock Grassland of *Triodia epactia*.

Onshore Environmental Consultants (2013) mapped six broad floristic communities with 13 vegetation associations within the application area:

Eucalyptus Low Woodland

1a: Low Woodland of *Eucalyptus victrix*, *Melaleuca glomerata* and *Eucalyptus leucophloia* subsp. *leucophloia* over High Shrubland of *Melaleuca glomerata*, *Acacia trachycarpa* and *Acacia colei* var. *colei* over Open Hummock Grassland of *Triodia longiceps* on major drainage lines.

1b: Low Woodland of *Eucalyptus victrix* and *Acacia ampliceps* over High Shrubland of *Acacia trachycarpa* and *Acacia colei* var. *colei* over Open Hummock Grassland of *Triodia longiceps* on medium drainage lines.

Acacia Open Scrub

2a: Open Scrub of *Acacia tumida* subsp. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* over Hummock Grassland of *Triodia epactia*, *Triodia wiseana* and *Triodia biflora* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* in minor drainage lines on mesa crests.

2b: Open Scrub of *Acacia trachycarpa* over Open Hummock Grassland of *Triodia longiceps* with Scattered Low Trees of *Eucalyptus victrix* and *Corymbia hamersleyana* on floodplains.

Acacia Low Open Heath

3: Low Open Heath of *Acacia stellaticeps* over Hummock Grassland of *Triodia epactia* and *Triodia longiceps* on plains.

Triodia Closed Hummock Grassland

4: Closed Hummock Grassland of *Triodia epactia* with Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana* over Low Open Shrubland of *Acacia stellaticeps* on sandy plains.

Triodia Hummock Grassland

5a: Hummock Grassland of *Triodia epactia* with High Shrubland of *Grevillea wickhamii* subsp. *hispidula* and *Acacia tumida* subsp. *pilbarensis* over Low Shrubland of *Acacia adoxa* var. *adoxo* and *Acacia ptychophylla* on mesa crests.

5b: Hummock Grassland of *Triodia epactia* and *Triodia wiseana* with High Open Shrubland of *Acacia tumida* subsp. *pilbarensis* and Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on sandstone breakaways.

5c: Hummock Grassland of *Triodia epactia* with High Shrubland of *Acacia ancistrocarpa*, *Acacia colei* var. *colei* and *Acacia trachycarpa* over Low Shrubland of *Acacia stellaticeps* on a mosaic of sandy and stony plains.

5d: Hummock Grassland of *Triodia longiceps* and *Triodia epactia* over Low Open Shrubland of *Acacia stellaticeps* with Scattered Tall Shrubs of *Acacia tumida* var. *pilbarensis*, *Acacia colei* var. *colei* and *Acacia ancistrocarpa* on stony plains.

5e: Hummock Grassland of *Triodia epactia* with High Shrubland of *Acacia colei* var. *colei*, *Acacia ancistrocarpa* and *Acacia tumida* var. *pilbarensis* and Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana* in drainage zones on plains.

5f: Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera* and Scattered Low Trees of *Corymbia hamersleyana* on scree slopes and footslopes.

Triodia Open Hummock Grassland

6: Open Hummock Grassland of *Triodia epactia* and *Triodia biflora* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Ficus brachypoda* over High Open Shrubland of *Acacia tumida* subsp. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* on mesa cliffines and gullies.

ENV (2008) mapped three broad floristic communities with seven vegetation associations within the application area:

Woodlands

ChAtTe: *Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis* high shrubland over *Acacia pyrifolia* open shrubland over *Acacia ptychophylla* and *Acacia adoxa* var. *adoxo* low scattered shrubs over *Triodia epactia* closed hummock grassland. This vegetation community is found in drainage lines in the north-west of the supplementary survey area.

EIAiTw: *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia inaequilatera* open shrubland over *Triodia wiseana* hummock grassland. Covers the slopes to the north of the ridge.

Ch/EIGwTe: *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* and *Acacia tumida* var. *pilbarensis* high shrubland over *Triodia epactia* hummock grassland. This vegetation community dominates the slopes closest to the ridge.

Ch/EIAtEm: *Corymbia hamersleyana*, *Corymbia flavescens* and *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* open shrubland over *Eriachne mucronata* (typical form) very open tussock grassland over *Triodia biflora*, *Triodia epactia* and *Triodia wiseana* hummock grassland. This vegetation type is located in the gorges, gullies and breakaways.

Shrublands

GwTe: *Grevillea wickhamii* subsp. *hispidula* high open shrubland over *Acacia stellaticeps* open shrubland over *Dampiera candidans* and *Leptosema anomalum* scattered low shrubs over *Triodia epactia* hummock grassland. Forms the drainage lines running to the south of the main ridge.

AoTe *Acacia orthocarpa*, *Grevillea pyramidalis* subsp. *leucadendron* and *Grevillea wickhamii* subsp. *hispidula* high shrubland over *Corchorus* aff. *parviflorus* (1)(GLD SRH67-5) and *Acacia adoxa* var. *adoxo* low open shrubland over *Triodia epactia* hummock grassland over *Cymbopogon ambiguus* scattered tussock grasses. This vegetation community is located to the south of the main range.

Grasslands

Gp/GwTe: *Grevillea pyramidalis* subsp. *leucadendron* and *Grevillea wickhamii* subsp. *hispidula* open shrubland over *Acacia ptychophylla*, *Acacia adoxa* var. *adoxo* and *Tephrosia* aff. *rosea* (HD292-37) low shrubland over *Triodia epactia* hummock grassland.

Ecologia (2005) mapped three broad floristic communities with eight vegetation associations within the application area:

Forest

1: *Corymbia flavescens* and/or *Atalaya hemiglauca* and/or *Ficus brachypoda* (sometimes with *Eucalyptus leucophloia* subsp. *leucophloia* moderately dense medium forest to sparse low woodland, over medium shrubs such as *Acacia tumida* var. *pilbarensis* / *Grevillea wickhamii* subsp. *hispidula* / *Grevillea pyramidalis* subsp. *leucadendron* / *Petalostylis labicheoides* / *Fluggea virosa* subsp. *melanthesoides* medium shrubs, over low shrubs such as *Solanum dioicum* and *Indigofera monophylla*, over tussock grasses such as *Cymbopogon ambiguus* / *Eriachne mucronata* (typical form), over *Triodia epactia* of *Triodia wiseana* moderately dense to sparse hummock grassland.

Woodland

2a: *Eucalyptus leucophloia* subsp. *leucophloia* (or *Corymbia hamersleyana*) open medium / low woodland or trees (sometimes with *Terminalia canescens* or *Corymbia flavescens*), over *Acacia tumida* subsp. *pilbarensis* (or *Petalostylis labicheoides*) moderately dense to scattered tall/ medium shrubland, over medium shrubs such as *Acacia pyrifolia*, over low shrubs such as *Dampiera candidans* / *Sida* sp.A Kimberley Flora (P.A. Fryxell & I.A. Craven 3900) or *Triumfetta plumigera* / *Triumfetta maconochleana*, over dwarf shrubs such as *Indigofera monophylla*, over mixed tussock grass and spinifex hummock grasses.

2b: *Eucalyptus leucophloia* subsp. *leucophloia* open low woodland, over *Hakea chordophylla* scattered tall shrubland, over *Triumfetta maconochleana* / *Senna glutinosa* subsp. *glutinosa* scattered low shrubland, over *Triodia wiseana* moderately dense hummock grassland.

Shrublands

3a: *Acacia tumida* var. *pilbarensis* (also with *Grevillea wickhamii* subsp. *hispidula* / *Acacia pyrifolia* / *Petalostylis labicheoides*) moderately dense to open tall / medium shrubland, sometimes with *Corymbia hamersleyana* open low woodland to scattered trees, or with *Eucalyptus odontocarpa* open medium / low mallee, over open to low shrubs such as *Dampiera candidans* / *Acacia ptychophylla* / *Indigofera monophylla* (small calyx form), over tussock grasses and *Triodia epactia* or *Triodia biflora* hummock grasses.

3b: *Grevillea wickhamii* subsp. *hispidula* open to sparse tall / medium shrubland (sometimes with *Corymbia hamersleyana* / *Acacia pyrifolia* / *Acacia tumida* var. *pilbarensis*), over *Acacia ptychophylla* / *Dampiera candidans* moderately dense to sparse dwarf shrubland (occasionally with *Indigofera monophylla* (small calyx form), over *Goodenia stobbsiana* herbs, over *Triodia epactia* or *Triodia wiseana* open (to moderately dense) hummock grassland.

3c: *Grevillea wickhamii* subsp. *hispidula* / *Acacia inaequilatera* open medium to tall shrubland, over *Goodenia stobbsiana* scattered herbs, over *Triodia epactia* moderately dense hummock grassland.

3d: *Petalostylis labicheoides* / *Acacia tumida* var. *pilbarensis* / *Grevillea wickhamii* subsp. *hispidula* moderately dense to sparse medium shrubland (sometimes with *Corymbia hamersleyana* or *C. aff. hamersleyana*), over *Triodia epactia* moderately dense to sparse hummock grassland.

3e: *Grevillea wickhamii* subsp. *hispidula* moderately dense to sparse medium flow shrubland (sometimes with *Eucalyptus leucophloia* subsp. *leucophloia*, *Petalostylis labicheoides* and *Acacia tumida* var. *pilbarensis* trees and shrubs), over *Acacia spondylophylla* (and sometimes *Solanum dioicum* / *Corchorus* spp.) / *Acacia ptychophylla* moderately dense to scattered low / dwarf shrubland, over *Triodia epactia* moderately dense to sparse hummock grassland.

Astron (2014) mapped five broad floristic communities with eight vegetation associations within the application area:

Acacia Tall Open Scrub to Acacia Low Open Forest

1a: Tall Open Scrub to Low Open Forest of *Acacia tumida* var. *pilbarensis*, *A. colei* and *Terminalia canescens* over Open Hummock Grassland to Hummock Grassland of *Triodia epactia* and Very Open Tussock Grassland of **Cenchrus ciliaris*, with Tall Shrubland to Tall Open Shrubland of *Acacia trachycarpa*, *Carissa lanceolata* and *Tephrosia rosea* var. *clementii*. Occurs as a mosaic with vegetation association 2a and 5c.

1b: Low Open Forest of *Acacia tumida* var. *pilbarensis*, *Corymbia hamersleyana* and *Grevillea wickhamii* subsp. *hispidula* over Closed Hummock Grassland of *Triodia epactia* and *T. wiseana* with Open Shrubland of *Acacia ptychophylla*.

Eucalyptus Scattered Low Trees to Scattered Trees with patches of Low Open Woodland to Open Woodland

3a: Scattered Low Trees to Scattered Trees with patches of Low Open Woodland to Open Woodland of *Eucalyptus camaldulensis* subsp. *refulgens*, *E. victrix* and *Corymbia hamersleyana*.

Melaleuca Open Forest

4a: Open Forest of *Melaleuca argentea* over Open Tussock Grassland of *Cyperus vaginatus* and *Cymbopogon ambiguus*.

Triodia Hummock Grassland

5a: Hummock Grassland of *Triodia epactia* and *T. wiseana* with Low Open Heath of *Acacia ptychophylla* and *Goodenia stobbsiana* and Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Acacia inaequilatera* and *Grevillea wickhamii* subsp. *hispidula*.

5b: Hummock Grassland of *Triodia longiceps* and *T. wiseana* and Very Open Tussock Grassland of **Cenchrus ciliaris* with Very Open Shrubland to Open Shrubland of *Corchorus elachocarpus*, *Senna glutinosa* subsp. *glutinosa* and *Tephrosia rosea* var. *clementii* and Scattered Low Trees to Low Woodland of *Corymbia hamersleyana*, *Acacia inaequilatera* and *Atalaya hemiglaucula*.

5d: Very Open Hummock Grassland to Hummock Grassland of *Triodia epactia* and Very Open Tussock Grassland of *Eriachne mucronata*, *E. tenuiculmis* and *Cymbopogon ambiguus* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Atalaya hemiglaucula* and *Terminalia canescens* over Tall Open Shrubland of *Acacia monticola*, *Grevillea wickhamii* subsp. *hispidula* and *Templetonia hookeri* and Shrubland to Open Shrubland of *Acacia ptychophylla*.

5e: Hummock Grassland to Closed Hummock Grassland of *Triodia epactia* and *T. wiseana* with Low Open Woodland of *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia inaequilatera* over Tall Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *G. pyramidalis* subsp. *leucadendron* and *Acacia colei* over Shrubland to Open Heath of *Acacia ptychophylla*.

Onshore Environmental Consultants (2010) described 10 broad floristic communities with 19 vegetation associations within the application area:

Eucalyptus Woodland

1 (Yarrie A): Woodland of *Eucalyptus victrix* over High Open Shrubland of *Petalostylis labicheoides* and *Acacia tumida* var. *pilbarensis* over Low Shrubland of *Tephrosia rosea* var. *clementii* and *Corchorus* sp.

2 (Yarrie A): Open Scrub of *Acacia colei*, *Acacia tumida* var. *pilbarensis* and *Acacia elachantha* over Hummock Grassland of *Triodia epactia* with Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana*.

1a (Yarrie B): Open Scrub of *Acacia tumida*, *Acacia colei* and *Acacia pyrifolia* over Open Hummock Grassland of *Triodia epactia* with Low Open Woodland of *Corymbia hamersleyana*.

1a (Yarrie B): Open Scrub of *Acacia colei*, *Acacia tumida* and *Grevillea wickhamii* over Open Hummock Grassland of *Triodia epactia* with Low Open Shrubland of *Pluchea tetranthera*.

Acacia Low Open Heath

2 (Yarrie B): Low Open Heath of *Acacia stellaticeps* over Hummock Grassland of *Triodia epactia* with Scattered Low Trees of *Corymbia hamersleyana*.

Acacia High Shrubland

3a (Yarrie A): High Shrubland of *Acacia colei* over Scattered Herbs of *Alternanthera nodiflora* and *Centipeda minima*.

3b (Yarrie A): High Shrubland of *Acacia tumida* var. *pilbarensis*, *Acacia colei* and *Acacia pyrifolia* over Low Shrubland of *Tephrosia rosea* var. *clementii*, *Pluchea tetranthera* and *Melhantha oblongifolia* with Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana*.

3c (Yarrie A): High Shrubland of *Acacia colei*, *Grevillea wickhamii* and *Grevillea pyramidalis* over Low Open Shrubland of *Pluchea tetranthera* over Hummock Grassland of *Triodia epactia*.

Low Scattered Shrubs

3c (Yarrie B): Scattered Shrubs over Scattered Hummock Grassland.

Various species

4 (Yarrie A): Scattered Shrubs of *Acacia* spp. and *Grevillea* spp. over Low Scattered Shrubs of *Pluchea tetranthera* and Scattered Hummock Grassland of *Triodia epactia*.

Triodia Closed Hummock Grassland

6 (Yarrie A): Closed Hummock Grassland of *Triodia epactia* with High Shrubland of *Acacia colei*, *Grevillea pyramidalis* and *Acacia elachantha* over Low Open Shrubland of *Pluchea tetranthera*.

4 (Yarrie B): Closed Hummock Grassland of *Triodia epactia* with High Shrubland of *Acacia tumida*, *Acacia colei* and *Acacia inaequilatera* over Low Open Shrubland of *Pluchea tetranthera*.

Triodia Hummock Grassland

7a (Yarrie A): Hummock Grassland of *Triodia wiseana* with High Open Shrublands of *Grevillea pyramidalis*, *Acacia inaequilatera* and *Acacia colei* with Scattered Low Trees of *Corymbia hamersleyana*.

7b (Yarrie A): Hummock Grassland of *Triodia wiseana* and *Triodia epactia* with High Shrublands of *Grevillea wickhamii*.

5a (Yarrie B): Hummock Grassland of *Triodia wiseana* with High Open Shrublands of *Acacia inaequilatera*, *Grevillea pyramidalis* and *Grevillea wickhamii* with Scattered Shrubs of *Senna glutinosa* ssp. *glutinosa*.

5b (Yarrie B): Hummock Grassland of *Triodia epactia* with Low Shrubland of *Acacia ptychophylla* with Scattered High Shrubs of *Acacia colei* and *Acacia inaequilatera*.

Triodia Open Hummock Grassland

8 (Yarrie A): Open Hummock Grassland of *Triodia epactia* and *Triodia longiceps* with Low Open Shrubland of *Pluchea tetranthera* over Scattered Low Herbs of *Trianthema triquetra* and *Portulaca oleracea*.

6 (Yarrie B): Open Hummock Grassland of *Triodia epactia* with Scattered Low Trees of *Corymbia hamersleyana* over Scattered High Shrubs of *Acacia tumida*, *Grevillea wickhamii* and *Acacia inaequilatera*.

Marsilea Herbland

7 (Yarrie B): Herbland of *Marsilea hirsuta* with Scattered Sedges of *Cyperus vaginatus* with Scattered Hummock Grasses of *Triodia longiceps* and *Triodia epactia*.

Onshore Environmental Consultants (2013a) described five broad floristic communities with eight vegetation associations within the application area:

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 Open Scrub

5b: Open Scrub of *Acacia tumida* var. *pilbarensis* and *Acacia colei* with Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana* and Open Sedges of *Typha domingensis* and *Cyperus vaginatus* in brown loamy sand on medium drainage lines.

Triodia Open Hummock Grassland

9: Open Hummock Grassland of *Triodia epactia* with Scattered Tall Shrubs of *Acacia synchronicia*, *Acacia inaequilatera* and *Acacia colei* and Scattered Low Shrubs of *Pluchea tetranthera* in silty loam on 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.

8c: Hummock Grassland of *Triodia epactia* with Low Open Shrubland of *Pluchea tetranthera*, *Acacia stellaticeps* and *Pluchea rubelliflora* over Very Open Bunch Grassland of *Sporobolus actinocladius*, *Sporobolus australasicus* and *Eragrostis cumingii* in brown sand along drainage lines and floodplains.

Triodia Closed Hummock Grassland

7a: Closed Hummock Grassland of *Triodia epactia* with High Open Shrubland of *Acacia colei*, *Grevillea pyramidalis* and *Acacia inaequilatera* over Scattered Low Shrubs of *Pluchea tetranthera* in orange brown loamy sand on plains.

7b: Closed Hummock Grassland of *Triodia epactia* with Low Open Woodland of *Corymbia hamersleyana* over High Open Shrubland of *Acacia ancistrocarpa*, *Acacia elachantha* and *Acacia inaequilatera* in brown sandy loam on sand plains.

7e: Closed Hummock Grassland of *Triodia epactia* with 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.

Ecologia (2005a) described five broad floristic communities with five vegetation associations within the Application Area:

1. *Triodia pungens* dominated steppes;
2. *Triodia basedowii* steppes;
3. Steep rocky Slopes;
4. Open density emergent over moderately dense *Triodia pungens*; and
5. Minor drainage lines.

* Denotes weed species

Clearing Description	Nimingarra to Yarrie Strategic Exploration Project. BHP Billiton Iron Ore Pty Ltd (BHP BIO) proposes to clear up to 444.82 hectares of native vegetation within a total boundary area of approximately 8578.8 hectares for the purpose of Geotechnical Investigations, Construction of Access Tracks, Drill Pads, Exploration and Hydrogeological Drilling, Rehabilitation of Historical Disturbance and Associated Activities. The proposal is located approximately 80 kilometres north-east of Marble Bar in the Shire of East-Pilbara.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994) To Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).
Comment	The vegetation condition was assessed by botanists from Onshore (2010, 2013, 2013a), Astron (2012, 2014), ENV (2008) and Ecologia (2005, 2005a).

3. Assessment of application against clearing principles

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

Comments **Proposal is not likely to be at variance to this Principle**

The application area is located mostly within the Chichester sub-region of the Pilbara Bioregion, with a small part of the application area falling within the McLarty sub-region of the Great Sandy Desert Bioregion, of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). The Chichester subregion is described as undulating granite and basalt plains with significant areas of basaltic ranges. Plains support a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on the ranges (CALM, 2002). The McLarty sub-region is described as mainly tree steppe grading to shrub steppe in the south; comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and Bloodwoods, and shrubs of *Acacia spp.*, *Grevillea wickhamii* and *G. refracta*, on red longitudinal sand dune fields overlying sandstones (CALM, 2002).

The clearing permit application area is made up of multiple areas, which include the existing Sunrise Hill 4 West Pit and 16 associated waste rock stockpiles (BHP, 2015). The majority of the application areas are within or immediately adjacent to existing mining operations (BHP, 2015).

Eight flora and vegetation surveys have been conducted over the application area by Onshore (2010, 2013, 2013a), Astron (2012, 2014), ENV (2008) and Ecologia (2005, 2005a). The vegetation was found to be represented in the surrounding areas and in the same or better condition (BHP, 2015). Given the disturbed nature of parts of the application area, the subject vegetation is not considered to contain higher diversity than the surrounding area (BHP, 2015).

No Threatened Flora or Threatened or Priority Ecological Communities were recorded within the application area during the flora and vegetation surveys (BHP, 2015). One population of *Euphorbia inappendiculata* subsp. *inappendiculata* (P2) and five populations of *Euphorbia clementii* (P2) have been recorded within the survey area during previous surveys, however, these populations were searched for at the location coordinates provided but were not located (Astron, 2014).

Fifteen weed species were identified in the application area (BHP, 2015). Of these, Calotrope (*Calotropis procera*), is listed as a Declared Pest under the *Biosecurity and Agriculture Management Act (2007)*. Kapok Bush, Calotrope, Buffel Grass and Mimosa Bush have a high rating under the *Environmental Weed Strategy for Western Australia* (BHP, 2015). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

A fauna survey has been undertaken over the entire application area by Onshore (2013). Other fauna surveys have been undertaken over parts of the application area by ENV (2011), Outback Ecology Services (Outback, 2008) and Ecologia (2005). These surveys have identified that faunal diversity is comparable to the surrounding region.

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

Methodology	Astron (2012) Astron (2014) BHP (2015) CALM (2002) Ecologia (2005) Ecologia (2005a) ENV (2008) ENV (2011)
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Onshore (2010)
Onshore (2013)
Onshore (2013a)
Outback (2008)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Threatened and Priority Flora
- Threatened Ecological Sites Buffered

(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.

Comments Proposal may be at variance to this Principle

A fauna survey has been undertaken over the entire application area by Onshore (2013), and over parts of the application area by ENV (2011), Outback Ecology Services (Outback, 2008) and Ecologia (2005). From these surveys the following seven habitat types have been identified as occurring within the application area (BHP, 2015):

- Plains / Alluvial Plain / Stony Plain
- Drainage Lines / Minor Drainage Line
- Major Drainage Line
- Cliffs
- Gorge / Gully
- Scree slopes / Foot slope
- Hills/ Hill Crests / Hill Slopes

Of these habitats, Drainage Lines and Gorge / Gullies are considered to be of higher conservation value (BHP, 2015). Whilst these habitats are considered to be well represented in the surrounding area (BHP, 2015), it is important to ensure that disturbance is kept to a minimum. BHP (2015) has committed to keeping the disturbance to the Drainage Line and Gorge / Gullies habitat to a minimum where possible. Where clearing is necessary, it will be for the purposes of access tracks or rehabilitation of previously disturbed areas (BHP, 2015).

Based on the fauna assessments undertaken over the application area, three conservation significant species have been recorded within the application area:

1. Northern Quoll (*Dasyurus hallucatus*) (Endangered, Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act); Wildlife Conservation Act 1950 (WC Act), Schedule 1);
2. Rainbow Bee-eater (*Merops ornatus*) (EPBC Act, Migratory; WC Act, Schedule 3); and
3. Pilbara Olive Python (*Liasis olivaceus barroni*) (EPBC Act, Vulnerable; WC Act Schedule 1).

A further 11 species are considered 'possible' or 'likely' to occur within the Application Area:

1. Common Greenshank (*Tringa nebularia*) (EPBC Act, Migratory; WC Act, Schedule 3);
2. Common Sandpiper (*Actitis hypoleucos*) (EPBC Act, Migratory; WC Act, Schedule 3);
3. Eastern Great Egret (*Ardea modesta*) (EPBC Act, Migratory; WC Act, Schedule 3);
4. Eastern Osprey (*Pandion cristatus*) (EPBC Act, Migratory; WC Act, Schedule 3);
5. Fork Tailed swift (*Apus pacificus*) (EPBC Act, Migratory; WC Act, Schedule 3);
6. Glossy Ibis (*Plegadis falcinellus*) (EPBC Act, Migratory; WC Act, Schedule 3);
7. Greater Bilby (*Macrotis lagotis*) (EPBC Act, Vulnerable; WC Act, Schedule 1);
8. Great Egret (*Ardea alba*) (EPBC Act, Migratory; WC Act, Schedule 3);
9. Peregrine falcon (*Falco hypoleucos*) (WC Act, Schedule 4);
10. Pilbara Leaf-nosed Bat (*Rhinonictes aurantia*) (EPBC Act, Vulnerable; WC Act, Schedule 1); and
11. Wood Sandpiper (*Tringa glareola*) (EPBC Act, Migratory; WC Act, Schedule 3).

Suitable habitat for avian fauna species such as Australian Bustard, Bush-stone Curlew, and Rainbow Bee-eater is widespread in the region (BHP, 2015). These highly mobile species are unlikely to rely on the habitats within the application area (BHP, 2015).

No suitable roosts have been identified within the application area for the Ghost Bat (BHP, 2015). One cave was recorded within the application area which is used as a feeding roost only (BHP, 2015). This species may forage over the application area; however more suitable habitat is located in the surrounding area (BHP, 2015).

There was one opportunistic record of Northern Quoll within the northern end of the application area. This was an opportunistic sighting and likely to be a transient individual (ENV, 2011). It is likely that Northern Quolls also forage within the Drainage Line habitat (BHP, 2015). No natural denning habitat occurs within the application area (BHP, 2015). Suitable denning and foraging habitat is available in the surrounding area and Northern Quolls are unlikely to be reliant on any habitats occurring within the application area (BHP, 2015).

There was one record of the Pilbara Olive Python within the application area (BHP, 2015). This species may den within the Cliff Line and Gully habitat and forage along the Drainage Line habitat (BHP, 2015). BHP (2015) has advised that clearing of Cliff Line and Gully habitat will be avoided due to inaccessibility. This species has been recorded within the surrounding area (ENV, 2011; Ecologia, 2005).

There were no active Western Pebble-mound Mouse mounds recorded within the application area (BHP BIO, 2015). Suitable habitat for this species is widespread in the surrounding areas (BHP, 2015). Similarly there is widespread habitat for the Short-tailed Mouse in the surrounding areas (BHP, 2015).

BHP (2015) has indicated that there may be some minor clearing in the Drainage Line habitat and Gully habitat. Drainage Line and Gully habitat is considered to have high conservation value as it offers large habitat diversity, an ecological linkage for species to move through the area as well as important foraging grounds (Onshore, 2013). Potential impacts to this habitat type may be minimised by the implementation of watercourse management conditions.

Based on the above, the proposed clearing may be at variance to this Principle

Methodology BHP (2015)
Ecologia (2005)
ENV (2011)
Onshore (2013)
Outback (2008)

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

Comments Proposal is not likely to be at variance to this Principle

Flora surveys of the application area did not record any species of Threatened Flora, Priority Flora or other flora species of conservation significance (Astron, 2012; BHP, 2015).

The vegetation associations within the application area are common and widespread within the region (Astron, 2012; BHP, 2015; GIS Database), and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of rare flora.

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

Methodology Astron (2012)
BHP (2015)
GIS Database:
- Threatened and Priority Flora

(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.

Comments Proposal is not likely to be at variance to this Principle

There are no known Threatened Ecological Communities (TEC's) located within a 100 kilometre radius of the application area (GIS Database).

Surveys of the application area did not identify any Threatened Ecological Communities (Astron, 2012; BHP Billiton, 2015).

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

Methodology Astron (2012)
ENV (2008)
GIS Database:
- Threatened Ecological Sites Buffered

(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.

Comments Proposal is not at variance to this Principle

The areas applied to be cleared are located on the boundary of the Pilbara and Great Sandy Desert IBRA bioregions, with the majority of the application areas broadly mapped as falling within the Pilbara Bioregion (GIS Database). There is approximately 99% of Pre-European vegetation remaining within both of these bioregions (Government of Western Australia, 2013). The vegetation of the application area is classified predominantly as Beard vegetation associations: 93 - Hummock grasslands, shrub steppe; kanji over soft spinifex; and 171 - Hummock grasslands, low tree steppe; snappy gum over soft spinifex & *Triodia brizoides*; with a small section of the application area classified as Beard vegetation association 117: Hummock grasslands, grass steppe; soft spinifex. These vegetation associations remain at approximately 96-99% of pre-European extent in the state and 94-99% in the two bioregions (Government of Western Australia, 2013). Hence, the vegetation proposed to be cleared does not represent a significant remnant of vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPAW Managed Lands
IBRA Bioregion - Pilbara	17,808,657	17,733,584	~99	Least Concern	6.3
IBRA Bioregion – Great Sandy Desert	29,538,805	29,535,816	~99	Least Concern	2.7
Beard vegetation associations - State					
93	3,044,310	3,040,641	~99	Least Concern	0.44
117	919,517	886,005	~96	Least Concern	13.26
171	331,952	330,643	~99	Least Concern	0
Beard vegetation associations - Pilbara Bioregion					
93	3,042,114	3,038,471	~99	Least Concern	0.44
117	82,706	78,097	~94	Least Concern	14.60
171	331,307	330,026	~99	Least Concern	0
Beard vegetation associations - Great Sandy Desert Bioregion					
93	1,107	1,096	~99	Least Concern	0
117	467,579	467,122	~99	Least Concern	0.19
171	644	617	~96	Least Concern	0

* Government of Western Australia (2013)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2013)
GIS Database:
- IBRA WA (regions – subregions)
- Pre-European Vegetation

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

Comments Proposal may be at variance to this Principle

There are no permanent watercourses or wetlands within the application area (GIS Database). Three ephemeral creeks (Eel Creek, Egg Creek and Coonjeena Creek) are located within the application area (BHP, 2015).

Onshore (2013) has identified two vegetation associations (1a and 1b Eucalyptus Low Woodland) growing in association with the ephemeral creeks, and Ecologia (2005) identified one (minor drainage lines). BHP has advised that clearing within these vegetation associations will be avoided where possible (BHP, 2015). Where clearing is necessary, the purposes of the clearing will be for access tracks or rehabilitation of previously disturbed areas (BHP, 2015).

Potential impacts to riparian vegetation may be minimised through the implementation of a watercourse management condition and a condition which restricts clearing within major drainage lines to access tracks only.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology BHP (2015)
Ecologia (2005)
Onshore (2013)
GIS Database:

- Hydrography, linear

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

Comments Proposal is not likely to be at variance to this Principle

The application areas fall predominantly within the Capricorn and Boolgeeda Land Systems, with small sections of the application area falling within the Nita, Macroy and Callawa Land Systems (GIS Database).

The Boolgeeda Land System is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands (Van Vreeswyk et al., 2004). This system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Capricorn Land System is characterised by hills and ridges of sandstone and dolomite supporting hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). This system has low susceptibility to erosion due to its stony soils (Van Vreeswyk et al., 2004).

The Nita Land System is characterised by sandplains supporting shrubby soft spinifex grasslands with occasional trees (Van Vreeswyk et al., 2004). This land system has very low occurrences of erosion (Van Vreeswyk et al., 2004).

The Macroy Land System is characterised by stony plains and occasional tor fields based on granite, supporting hard and soft spinifex grasslands. This system has a low to very low risk of erosion (Van Vreeswyk et al., 2004).

The Callawa Land System is characterised by highly dissected low hills, mesas and gravelly plains of sandstone and conglomerate supporting soft and hard spinifex grasslands. This system is not prone to erosion (Van Vreeswyk et al., 2004).

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

Methodology Van Vreeswyk et al. (2004)
GIS Database:
- Rangeland Land System Mapping

(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.

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing is not located within a conservation reserve (GIS Database). The nearest conservation area is the ex-Meentheena pastoral lease, a former leasehold proposed for conservation, which is located approximately 63 kilometres south-east of the application area (GIS Database).

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

Methodology GIS Database:
- DEC Tenure

(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.

Comments Proposal is not likely to be at variance to this Principle

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

There are no permanent watercourses or wetlands within the application area (GIS Database). Three seasonal watercourses (Eel Creek, Egg Creek and Coonjeena Creek) pass through the application area (GIS Database). Drainage lines in the area are dry for most of the year, only flowing briefly immediately following significant rainfall (BHP, 2015). Clearing within drainage lines is proposed to be avoided where possible, or where necessary, will only be for the purpose of access tracks or rehabilitation of previously disturbed areas (BHP, 2015). Given the sandy nature of the creeks and infrequent flow, the proposed clearing is not likely to significantly increase sedimentation or otherwise impact on water quality. Management practices will be implemented to minimise the risk of erosion and potential impacts to surface water quality (BHP, 2015).

Groundwater in the application area is at a depth of approximately 50 metres (BHP, 2015), and removal of the predominantly spinifex vegetation is unlikely to have any significant impact on groundwater levels. The proposed clearing is unlikely to result in increased sedimentation of any watercourse, or cause deterioration in the quality of surface or underground water.

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

Methodology BHP (2015)
GIS Database:

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

Comments Proposal is not likely to be at variance to this Principle

The application area is located within the DeGrey River catchment area (GIS Database). Given the size of the area to be cleared (444.82 hectares) in relation to the size of the catchment area (845,936 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

The application area experiences a semi-desert tropical climate with summer cyclonic or thunderstorm rainfall, with an annual average rainfall of approximately 327.2 millimetres per year (CALM, 2002; BoM, 2015). Based on an average annual evaporation rate of 3,400 - 3,600 millimetres (GIS Database), there is likely to be little surface flow during normal seasonal rains. Whilst large rainfall events may result in flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2015)
CALM (2002)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments - Catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There is one Native Title Claim (WC1999/008) over the area under application (GIS Database). This claim has been determined by the Federal Court of Australia. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

According to available databases there are several Aboriginal Sites of Significance located within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no sites of Aboriginal significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, Department of Parks and Wildlife and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 23 February 2015 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Registered with the NNTT
- Native Title Claims - Filed at the Federal Court
- Native Title Claims - Determined by the Federal Court

4. References

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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
s.17	Section 17 of <i>the Environment Protection Act 1986</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

- T** **Threatened species:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened Fauna and Flora are further recognised by the Department according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo *Calyptorhynchus latirostris* is specially protected under the *Wildlife Conservation Act 1950* as a threatened species with a ranking of Endangered.

Rankings:
CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.
EN: Endangered - considered to be facing a very high risk of extinction in the wild.
VU: Vulnerable - considered to be facing a high risk of extinction in the wild.
- X** **Presumed Extinct species:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).
- IA** **Migratory birds protected under an international agreement:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice.
Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction.
- S** **Other specially protected fauna:**
Specially protected under the *Wildlife Conservation Act 1950*, listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- P1** **Priority One - Poorly-known species:**
Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
- P2** **Priority Two - Poorly-known species:**
Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
- P3** **Priority Three - Poorly-known species:**
Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
- P4** **Priority Four - Rare, Near Threatened and other species in need of monitoring:**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
- P5** **Priority Five - Conservation Dependent species:**
Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.