



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3215/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: Iron Ore (Mount Newman) Agreement Act 1964, Mineral Lease 244SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: South Parmelia Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
140		Mechanical Removal	Mineral exploration

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 at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. The following two Beard Vegetation Associations are located within the application area (GIS Database):

- 18:** Low woodland; mulga (*Acacia aneura*); and
- 82:** Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (Shepherd, 2007).

A biological survey of the project area conducted by Onshore Environmental Consultants Pty Ltd and Biologic Environmental Science (hereafter referred to as Onshore and Biologic) in January 2009 identified fourteen vegetation types classified further into six broad groups (on the basis of canopy structure) for the project area:

1. Low Forest B (associated with gorges)

1A. *Corymbia ferriticola*, *Eucalyptus leucophloia* ssp. *leucophloia*, *Acacia aneura* var. *tenuis*, *Acacia aneura* var. *major*, *Corymbia hamersleyana* Low Forest B over *Acacia hamersleyensis*, *Dodonaea viscosa* ssp. *mucronata*, *Eremophila tietkensis*, *Astrotricha hamptonii*, *Hibiscus haynaldii* Open Low Scrub A over *Ptilotus obovatus*, *Indigofera fractiflexa*, *Sida* sp. Golden calyces glabrous (H.N. Foote 32) Open Dwarf Scrub D over *Eriachne mucronata*, *Aristida burbridgeae*, *Cymbopogon ambiguus*, *Themeda triandra* open tall grass over *Triodia pungens* open hummock grass.

2. Woodland (associated with major drainage lines)

2A. *Eucalyptus camaldulensis* var. *obtusa*, *Eucalyptus victrix*, *Eucalyptus xerothermica* woodland over *Acacia coriacea* ssp. *pendens*, *Acacia citrinoviridis* Low Woodland B over *Petalostylis labicheoides*, *Stylobasium spathulatum*, *Gossypium robinsonii* Open Low Scrub B over *Tephrosia rosea* var. *glabrior*, *Stemodia grossa* Open Dwarf Scrub D over *Triodia pungens* open hummock grass over *Themeda triandra*, *Eulalia aurea* open tall grass.

3. Low Woodland A (associated with medium-sized drainage lines and stony plains)

3A. *Eucalyptus xerothermica*, *Corymbia hamersleyana*, *Acacia aneura* var. *major* Low Woodland A over *Petalostylis labicheoides* Open Scrub over *Acacia pyrifolia*, *Rulingia luteiflora*, *Stylobasium spathulatum*, *Gossypium robinsonii* Low Scrub B over *Tephrosia rosea* var. *glabrior*, *Scaevola parvifolia* ssp. *pilbarae*, *Senna notabilis* Open Dwarf Scrub D over *Themeda triandra* very open tall grass over *Triodia pungens* open hummock grass.

3B. *Acacia aneura* var. *tenuis*, *Acacia aneura* var. *major* Low Woodland A over *Acacia synchronicia*, *Acacia tetragonophylla*, *Eremophila forrestii* ssp. *forrestii* Open Low Scrub A over *Eremophila cuneifolia*, *Senna stricta* Dwarf Scrub C over *Maireana triptera* Open Dwarf Scrub D over *Triodia wiseana*, *Triodia pungens* open hummock grass over *Enneapogon caeruleascens*, *Enneapogon polyphyllus*, *Aristida contorta* very open low grass.

4. Low Woodland B (associated with breakaway ridges/cliffs and minor drainage lines)

4A. *Eucalyptus leucophloia* ssp. *leucophloia*, *Acacia aneura* var. *tenuis*, *Corymbia ferriticola*, *Acacia citrinoviridis* Low Woodland B over *Dodonaea viscosa* ssp. *mucronata*, *Scaevola acacioides*, *Eremophila latrobei* ssp. *latrobei*, *Hibiscus haynaldii* Open Low Scrub B over *Ptilotus obovatus*, *Eremophila jucunda* ssp. *pulcherrima*, *Sida* sp. Shovellana Hill, *Abutilon otocarpum* Open Dwarf Scrub C over *Triodia pungens* open hummock grass over *Themeda triandra*, *Eriachne mucronata*, *Cymbopogon ambiguus* open tall grass.

- 4B.** *Eucalyptus leucophloia* ssp. *leucophloia*, *Corymbia hamersleyana* Low Woodland B over *Petalostylis labicheoides*, *Acacia monticola* open scrub over *Petalostylis labicheoides*, *Rulingia luteiflora*, *Gossypium robinsonii* Open Low Scrub B over *Senna notabilis*, *Solanum phlomoides*, *Indigofera monophylla*, *Keraudrenia velutina* ssp. *elliptica* Open Dwarf Scrub D over *Triodia wiseana*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* open hummock grass.
- 5. Open Low Woodland B (associated with hill slopes, undulating low hills and floodplains)**
- 5A.** *Eucalyptus leucophloia* ssp. *leucophloia* Open Low Woodland B over *Acacia bivenosa* Open Low Scrub B over *Triodia wiseana* hummock grass.
- 5B.** *Eucalyptus leucophloia* ssp. *leucophloia*, *Corymbia deserticola* ssp. *deserticola*, *Corymbia hamersleyana* Open Low Woodland B over *Hakea chordophylla* open scrub over *Acacia arida* Open Low Scrub B over *Corchorus lasiocarpus* ssp. *parvus*, *Indigofera monophylla*, *Halgania gustafsenii* var. *gustafsenii*, *Gompholobium karjini* Open Dwarf Scrub D over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grass over *Amphipogon sericeus* very open low grass.
- 5C.** *Acacia aneura* var. *tenuis*, *Acacia aneura* var. *intermedia*, *Acacia pruinocarpa* Open Low Woodland B over *Petalostylis labicheoides*, *Stylobasium spathulatum*, *Sida* sp. spiciform panicles (E. Leyland s.n. 14/8/90), *Eremophila forrestii* ssp. *forrestii* Open Low Scrub B over *Corchorus lasiocarpus* ssp. *parvus*, *Indigofera monophylla*, *Solanum phlomoides* Open Dwarf Scrub D over *Triodia wiseana*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* hummock grass over *Themeda triandra* very open tall grass.
- 5D.** *Eucalyptus leucophloia* ssp. *leucophloia*, *Eucalyptus xerothermica*, *Acacia aneura* var. *tenuis* Open Low Woodland B over *Eucalyptus gamophylla* very open tree mallee over *Acacia inaequilatera*, *Petalostylis labicheoides* open scrub over *Acacia aneura* var. *tenuis*, *Petalostylis labicheoides*, *Acacia pruinocarpa* Open Low Scrub B over *Corchorus lasiocarpus* ssp. *parvus*, *Indigofera monophylla*, *Sida arenicola* Open Dwarf Scrub D over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana*, *Triodia pungens* hummock grass.
- 5E.** *Eucalyptus leucophloia* ssp. *leucophloia* Open Low Woodland B over *Dampiera candicans*, *Gompholobium karjini*, *Corchorus lasiocarpus* ssp. *parvus* Dwarf Scrub D over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* open hummock grass over *Eriachne lanata*, *Amphipogon sericeus* very open low grass.
- 6. Very Open Tree Mallee (associated with hill crests, mid/lower hill slopes and calcrete plains that support mallees)**
- 6A.** *Eucalyptus leucophloia* ssp. *leucophloia*, *Corymbia hamersleyana* Open Low Woodland B over *Eucalyptus kingsmillii* ssp. *kingsmillii*, *Eucalyptus gamophylla* very open tree mallee over *Petalostylis labicheoides*, *Codonocarpus cotinifolius* Open Low Scrub B over *Corchorus lasiocarpus* ssp. *parvus*, *Sida* sp. Golden calyces glabrous (H.N. Foote 32), *Dampiera candicans* Open Dwarf Scrub D over *Triodia pungens*, *Triodia wiseana*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) open hummock grass.
- 6B.** *Eucalyptus leucophloia* ssp. *leucophloia*, *Acacia aneura* var. *tenuis*, *Acacia citrinoviridis* Open Low Woodland B over *Eucalyptus pilbarensis* very open tree mallee over *Scaevola acacioides*, *Acacia bivenosa*, *Eremophila latrobei* ssp. *latrobei* Open Low Scrub B over *Triodia* sp. Shovelanna Hill hummock grass.
- 6C.** *Eucalyptus socialis* ssp. *eucentrica* very open tree mallee over *Acacia bivenosa*, *Petalostylis labicheoides* Open Low Scrub B over *Solanum phlomoides*, *Haloragis maierae*, *Haloragis gossei* var. *gossei* Open Dwarf Scrub D over *Triodia wiseana* hummock grass.

The majority of vegetation communities at the survey sites were described to be in 'Excellent' to 'Very Good' condition, with only two sites exhibiting 'Good' vegetation condition due to the presence of weed species (Onshore and Biologic, 2009). Overall, these vegetation types were deemed to be well represented and generally widespread within the application area (Onshore and Biologic, 2009).

Clearing Description	BHP Billiton Iron Ore Pty Ltd (hereafter referred to as BHPBIO) have applied for a Purpose Permit to clear up to 140 hectares within an area of approximately 4,688 hectares (BHPBIO, 2009a). The proposed clearing would allow the proponent to conduct mineral exploration activities (BHPBIO, 2009a). Clearing will be for a muster point for laydown and an office area, an exploration drilling program at approximately 150 by 50 metres drill line spacing, 20 metre by 20 metre sized drill pads and access tracks (BHPBIO, 2009a). The application area is located approximately 54 kilometres north-west of Newman (GIS Database).
	Vegetation clearing will be conducted using mechanical means (BHPBIO, 2009a).
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive; to Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).
Comment	The vegetation condition rating is derived from information provided by Onshore and Biologic (2009).

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

BHPBIO (2009a) propose to clear 140 hectares for the South Parmelia exploration project. The application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Hamersley subregion is characterised by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

Onshore Environmental Consultants Pty Ltd and Biologic Environmental Science (Onshore and Biologic) (2009) undertook a biological survey (which consisted of a one-season Level 2 flora and vegetation survey and a Level 1 fauna survey) that encompassed the application area. The flora and vegetation survey was conducted between 15 to 25 January 2009 and recorded a total of 290 plant taxa (including varieties and subspecies) from 48 families and 129 genera (Onshore and Biologic, 2009). One species of Declared Rare Flora (DRF), *Lepidium catapycnon*, was identified at 27 locations (Onshore and Biologic, 2009). Three species of Priority Flora were identified within the application area; these consisted of *Goodenia* sp. East Pilbara (P1) (four collections taken from a single location), *Rostellularia adscendens* var. *latifolia* (P3) (recorded at three locations) and *Tephrosia* sp. Pilbara Ranges (P3) (recorded from a single location).

Fourteen vegetation types, further classified into six broad groups on the basis of canopy structure, were identified within the application area (Onshore and Biologic, 2009). The condition of the vegetation was defined as ranging between 'Good' and 'Excellent', with the majority of the vegetation types described as being in 'Very Good' to 'Excellent' condition (Onshore and Biologic, 2009). Overall, these vegetation types were deemed to be well represented and generally widespread within the project area (Onshore and Biologic, 2009). Clearing permit CPS 3042/1 held by BHPBIO was granted on 11 June 2008 for mineral exploration in an area adjacent to the application area. The flora and vegetation survey conducted by ENV Australia Pty Ltd (herein referred to as ENV Australia) (2009) stated that a total of 286 plant taxa from 42 families and 117 genera were identified within the approved permit area. ENV Australia (2009) stated that the number of taxa recorded in the proposed clearing area compares well with other larger project areas surveyed in the surrounding area. As such, the flora taxa within the application area are no more biologically diverse than the flora taxa within the surrounding areas.

Beard Vegetation Associations 18 and 82 occur within the application area (GIS Database). As the majority of the Pilbara bioregion remains predominantly uncleared and the two Beard Vegetation Associations are at approximately 100% of their original extent, the application area does not represent a significant remnant of vegetation in an area that has been extensively cleared (Shepherd, 2007). Onshore and Biologic (2009) reported that all of the vegetation associations within the application area are deemed to be widespread with regular occurrence in the regional context.

Onshore and Biologic (2009) identified five introduced species of flora during the survey of the application area. These introduced species were recorded as minor components of vegetation associated with major drainage lines and flood plains, typically in the north-western section of the application area (Onshore and Biologic, 2009). The introduced species of flora included:

1. *Bidens bipinnata* (Bipinnate Beggartick);
2. *Cenchrus ciliaris* (Buffel Grass);
3. *Malvastrum americanum* (Spiked Malvastrum);
4. *Setaria verticillata* (Whorled Pigeon Grass); and
5. *Vachellia farnesiana* (Mimosa Bush) (Onshore and Biologic, 2009).

In order to minimise the spread of weed species and the risk of introducing additional weed species into the application area, it is recommended that, should the permit be granted, a condition be imposed on the permit for the purpose of weed management.

The fauna survey was conducted between 15 to 25 January 2009 and recorded a total of 70 species of vertebrate fauna, the majority of which were avian taxa (Onshore and Biologic, 2009). The survey identified eleven mammal species (including one introduced mammal species), 49 bird species, nine reptile species and one amphibian species were recorded within the application area (Onshore and Biologic, 2009). Seven species of conservation significant fauna were recorded during the fauna survey (Onshore and Biologic, 2009). Five broad fauna habitats were identified within the application area, and these were determined to not support any greater range of terrestrial species compared to surrounding areas (Onshore and Biologic, 2009). Additionally, the clearing associated with the mineral exploration is unlikely to affect conservation significant fauna as no restricted habitat types were identified within the application area and the fauna habitats within the application area were present within the surrounding areas.

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

Methodology BHPBIO (2009a).
CALM (2002).
ENV Australia (2009).
Onshore and Biologic (2009).
Shepherd (2007).
GIS Database:
- Interim Biogeographic Regionalisation for Australia.
- Interim Biogeographic Regionalisation for Australia (subregions).
- Pre-European Vegetation.

(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 is not likely to be at variance to this Principle

Onshore and Biologic (2009) surveyed the application area and identified five broad habitat types; these included:

1. Riverine:

Eucalyptus camaladulensis and *E. victrix* over sparse medium and low shrubs, over herbs and grasses. Considered to have 'Medium' overall value for conservation significant fauna.

2. Minor drainage line:

Scattered *Eucalyptus hamersleyana* sometimes over scattered regrowth of medium and low shrubs, over herbs and hummock grass. Considered to have 'Low' overall value for conservation significant fauna.

3. Gorge:

Corymbia ferritcola, *Eucalyptus leucophloia*, *Acacia aneura* low forest b over *Acacia hamersleyensis*, *Dodonaea viscosa*, *Eremophila tietkensis*, *Astrotricha hamptonii* open low scrub a over *Ptilotus obovatus*, open dwarf scrub d over *Themeda triandra* open tall grass over *Triodia pungens* open hummock grass. Considered to have 'High' overall value for conservation significant fauna.

4. Spinifex hilltop/slopes:

Scattered *Eucalyptus leucophloia* over scattered medium shrubs, over *Triodia hummock* grassland. Considered to have 'Low' overall value for conservation significant fauna.

5. Patches of Mulga woodland:

Moderately dense tall shrubs of *Acacia aneura* and *Acacia* spp. Considered to have 'Medium' overall value for conservation significant fauna.

During the survey, Onshore and Biologic (2009) reported sighting seven conservation significant fauna species; these included the Pilbara Olive Python (*Liasis olivaceus barroni*) (listed as 'Vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)), Australian Bustard (*Ardeotis australis*) (listed as 'Priority 4' under the Department of Environment and Conservation (DEC) Priority Fauna list), Western Pebble Mound Mouse (*Pseudomys chapmani*) (listed as 'Priority 4' under the DEC Priority Fauna list) and four bird species (Brown Goshawk, *Accipiter fasciatus*; Brown Falcon, *Falco berigora*; Whistling Kite, *Haliastur sphenurus*; and Australian Kestrel, *Falco cenchroides*) listed as 'Migratory' under the EPBC Act.

The most significant fauna habitat within the application area for conservation significant fauna is the 'Gorge' fauna habitat (Onshore and Biologic, 2009). The Pilbara Olive Python is mostly found within gorges and heavily dissected drainage lines (Onshore and Biologic, 2009). As confirmed by BHPBIO (2009b), the 'Gorge' fauna habitat will be avoided during the exploration drilling program. In order to avoid impacting the 'Gorge' fauna habitat within the application area, it is recommended that, should the permit be granted, a condition be imposed on the permit for the purpose of the proponent avoiding the 'Gorge' fauna habitat.

Overall, Onshore and Biologic (2009) considered that the fauna habitats found within the application area also occurred in the surrounding areas. Additionally, the habitat types that were important for conservation significant fauna were determined to be found throughout the Pilbara region, with no specific habitat types found within the application area (Onshore and Biologic, 2009). The major drainage lines (vegetation type 2A) associated with the tributaries which run into Weeli Wollie Creek within the north-western section and the northern fringe of the application area was determined to be an ecological linkage by Onshore and Biologic (2009); however, these will not be impacted by the exploration program (BHPBIO, 2009a).

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

Methodology BHPBIO (2009a).
BHPBIO (2009b).
Onshore and Biologic (2009).

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

Comments Proposal is at variance to this Principle

The Onshore and Biologic (2009) survey identified the Declared Rare Flora (DRF) species Hamersley Lepidium (*Lepidium catapycnon*) at 27 locations within the application area, with distinct population clusters occurring in the south-east, south-west and north-west corners of the application area. No additional records of DRF species were identified within the application area using the GIS Database.

Three Priority Flora species were identified within the application area; these consisted of *Goodenia* sp. East Pilbara (P1) (recorded in the report as *Goodenia* sp. Pilbara calcrete) (four collections taken from a single location), *Rostellularia adscendens* var. *latifolia* (P3) (recorded at three locations) and *Tephrosia* sp. Pilbara Ranges (P3) (recorded from a single location) (Onshore and Biologic, 2009).

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

However, this application is for clearing associated with mineral exploration. As such, there is a degree of flexibility associated with the positioning of access tracks, drill lines and drill holes. BHPBIO (2009a) commit to avoid locations of *L. catapycnon* during the exploration drilling program. In order to avoid impacting locations of *L. catapycnon* within the application area, it is recommended that, should the permit be granted, a condition be imposed on the permit for the purpose of maintaining a 50 metre buffer around each specimen of *L. catapycnon*.

Additionally, BHPBIO (2009a) commit to avoid locations of Priority Flora during the exploration drilling program. The P1 species *Goodenia* sp. East Pilbara is of particular importance as it may be reclassified as a species of DRF. In order to avoid impacting locations of Priority Flora within the application area, it is recommended that, should the permit be granted, a condition be imposed on the permit for the purpose of maintaining a 10 metre buffer around each specimen of Priority Flora.

Additionally, the vegetation types associated with the DRF and Priority Flora are found to be well represented and generally widespread within the application area and regionally (Onshore and Biologic, 2009). As such, the impact on rare flora and the associated vegetation types is likely to be negligible.

Methodology BHPBIO (2009a).
Onshore and Biologic (2009).
GIS Database:
- Declared Rare and Priority Flora List.

(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 records of Threatened Ecological Communities (TECs) within the application area (GIS Database). The closest TEC is the Ethel Gorge aquifer stygobiont community, located approximately 63 kilometres to the south-east of the application area (GIS Database). The proposed clearing is not likely to impact on any known TEC.

The Weeli Wolli Creek PEC is located approximately 6.5 kilometres north of the application area (Onshore and Biologic, 2009). Two tributaries that flow into the Weeli Wolli Creek occur within the application area; however, the field assessment conducted by Onshore and Biologic (2009) confirmed that the PEC did not occur within the application area.

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

Methodology Onshore and Biologic (2009).
GIS Database:
- Threatened Ecological Communities.

(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 application area falls within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.9% of the pre-European vegetation remains (Shepherd, 2007; GIS Database).

The vegetation within the application area is classified as:

- **Beard Vegetation Association 18:** Low woodland; mulga (*Acacia aneura*); and
- **Beard Vegetation Association 82:** Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (Shepherd, 2007; GIS Database).

As depicted within the table below, the application area does not represent a significant remnant of vegetation in an area that has been extensively cleared (Shepherd, 2007). The proposed clearing will not reduce the extent of Beard Vegetation Associations 18 and 82 below the recognised threshold level, below which species loss accelerates exponentially at an ecosystem level (EPA, 2000). Therefore, the bioregional conservation status for the Pilbara bioregion and for the Beard Vegetation Associations 18 and 82 is of 'Least Concern' (Department of Natural Resources and Environment, 2002).

While a relatively small percentage of the vegetation types within the Pilbara bioregion are protected within conservation reserves, the bioregion remains largely uncleared. The proposed clearing is unlikely to impact on the conservation status for Beard Vegetation Associations 18 and 82 within the Pilbara bioregion.

	Pre-European area (hectares)*	Current extent (hectares)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,188	17,794,647	~99.9	Least Concern	~6.32
Beard veg assoc. – State					
18	19,892,305	19,890,195	~100	Least Concern	~2.1
82	2,565,901	2,565,901	~100	Least Concern	~10.2
Beard veg assoc. – Bioregion					
18	676,557	676,557	~100	Least Concern	~16.8
82	2,563,583	2,563,583	~100	Least Concern	~10.2

* Shepherd (2007).

** 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).
EPA (2000).
Shepherd (2007).
GIS Database:
- Interim Biogeographic Regionalisation of Australia.
- 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 is at variance to this Principle

No permanent wetlands and watercourses occur within the application area (GIS Database).

The application area contains many minor non-perennial watercourses and major, non-perennial tributaries which flow into Weeli Wolli Creek (a major non-perennial watercourse) (GIS Database). These watercourses correspond with the following vegetation types:

Vegetation Code	Description	Vegetation Type
2	Woodland	Major Drainage
3	Low Woodland A	Medium-sized Drainage
4	Low Woodland B	Minor Drainage
5	Open Low Woodland B	Floodplain

Source: Onshore and Biologic (2009).

Based on the above, the proposed clearing is at variance to this Proposal.

However, Onshore and Biologic (2009) determined that the vegetation types associated with floodplains and drainage lines are regionally well represented and widespread. Vegetation type 2 (Woodland), located to the north-eastern end of the application area and associated with the tributaries that run into the Weeli Wolli Creek system, will not be impacted by the proposed exploration program (BHPBIO, 2009a). Additionally, BHPBIO's Exploration Environmental Management Plan (BHPBIO, 2009c) stated that drill holes will be sited in areas of low levels of vegetation and a suitable distance away from drainage lines. As such, it is unlikely that the disturbance caused by the proposed exploration program would significantly impact vegetation associated with the watercourses.

Methodology BHPBIO (2009a).
BHPBIO (2009c).
Onshore and Biologic (2009).
GIS Database:
- Hydrography, linear.
- RIWI Act, Rivers.

(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

Land system mapping by the Department of Agriculture and Food Western Australia has mapped a variety of rangeland land systems for the Pilbara bioregion. Land systems are mapped based on biophysical features such as soil and landform type, geology, geomorphology and vegetation type (Van Vreeswyk et al., 2004). The application area includes four different land systems (GIS Database). A broad description of each land system is given below:

Egerton:

The Egerton land system is characterised by dissected hardpan plains supporting mulga shrublands and hard spinifex hummock grasslands. Relief can be up to 20 metres. The Egerton land system is not prone to erosion (Van Vreeswyk et al., 2004). Approximately 25% of the application area has been mapped as the Egerton land system (GIS Database).

McKay:

The McKay land system is characterised by hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands. Relief can be up to 100 metres. The McKay land system is not prone to degradation or erosion (Van Vreeswyk et al., 2004). Approximately 10% of the application area has been mapped as the McKay land system (GIS Database).

Newman:

The Newman land system is characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. Relief is up to 450 metres. The Newman land system is not prone to erosion (Van Vreeswyk et al., 2004). Approximately 40% of the application area has been mapped as the Newman land system (GIS Database).

Platform:

The Platform land system is characterised by dissected slopes and raised plains supporting hard spinifex grasslands. The Platform land system is not susceptible to erosion (Van Vreeswyk et al., 2004). Approximately 25% of the application area has been mapped as the Platform land system (GIS Database).

The proposed clearing of 140 hectares for mineral exploration is unlikely to cause appreciable land degradation.

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 application area is not located within a conservation area (GIS Database). The nearest conservation area is the 'A'-class Karijini National Park which is located approximately 53 kilometres west of the application area (GIS Database). Given the distance separating the application area and the nearest conservation area, the proposed clearing is unlikely to impact on the conservation values of the Karijini National Park.

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

Methodology GIS Database:
- CALM Managed Lands and Waters.

(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 any proclaimed, gazetted or declared management areas or catchments (GIS Database). There are no named watercourses within the application area; however the area contains a number of minor non-perennial watercourses which flow north into a major, non-perennial tributary of the Weeli Wolli Creek (GIS Database). Weeli Wolli Creek, a perennial creek, is located approximately 300 metres to the north of the application area (GIS Database), and as such, care must be taken when clearing to prevent large volumes of sediment entering into the perennial creek.

Rainfall in the Pilbara tends to be unpredictable and erratic, and the rocky-sloping topography of much of the upper catchments often produces considerable runoff (Van Vreeswyk et al., 2004). As such, the non-perennial watercourses tend to have high levels of sedimentation and turbidity after rainfall events (Van Vreeswyk et al., 2004). The majority of the exploration program will be located in the middle and southern sections of the application area and located approximately 1.5 kilometres from the major non-perennial tributary of Weeli Wolli Creek (BHPBIO, 2009a). Given the unpredictable nature of rainfall in the Pilbara and the high levels of

sedimentation and turbidity within the non-perennial watercourses, the clearing of 140 hectares for the proposed mineral exploration program is unlikely to impact on surface water quality.

The application area is not located within a Public Drinking Water Source Area (GIS Database). The clearing associated with the mineral exploration program is unlikely to have an adverse effect on groundwater quality.

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

Methodology BHPBIO (2009a).
Van Vreeswyk et al. (2004).
GIS Database:
- Geodata, Lakes.
- Hydrography, linear.
- Public Drinking Water Source Areas (PDWSAs).
- RIWI Act, Rivers.

(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 proposed clearing area is located within land systems which feature high levels of topographic relief (between 20 to 450 metres) on soils that are generally not prone to degradation or susceptible to soil erosion (Van Vreeswyk et al, 2004). The application area receives approximately 250 millimetres of rainfall per annum and has an average evaporation rate of between approximately 3,400 and 3,600 millimetres per annum (GIS Database). The watercourses in the vicinity of the application area are non-perennial in nature and flow as a result of heavy rainfall (GIS Database).

Rainfall in the Pilbara bioregion is unpredictable and erratic; it depends on cyclonic activity and thunderstorms that occur mainly during the wet season/summer months (Van Vreeswyk et al., 2004). The rocky-sloping topography of much of the upper catchments often produces considerable runoff, and widespread flooding naturally occurs in the major river systems (Van Vreeswyk et al., 2004). The proposed clearing is unlikely to increase the incidence or intensity of flooding.

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:
- Evaporation Isopleths (Evaporation).
- Geodata, Lakes.
- Hydrography, linear.
- Isohyets (Rainfall).
- RIWI Act, Rivers.

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

Comments

There is one native title claim over the area under application; WC99_004 (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the tenement 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*.

There are four known Aboriginal Sites of Significance within the application area (three on the interim register and one as archived data) and five known Aboriginal Sites of Significance are located within 2 kilometres of the application area (one site on the permanent register and four sites on the interim register) (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 and Conservation 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.

No submissions were received by the Department of Mines and Petroleum for this application.

Methodology GIS Database:
- Aboriginal Sites of Significance.
- Native Title Claims.

4. Assessor's comments

Comment

The clearing principles have been addressed and the proposed clearing is at variance to Principles (c) and (f), is not likely to be at variance to Principles (a), (b), (d), (g), (h), (i) and (j) and is not at variance to Principle (e).

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of fauna management, flora management, weed management, rehabilitation, record keeping and permit reporting.

5. References

- BHPBIO (2009a) Native Vegetation Clearing Permit (Purpose Permit) Application Supporting Documentation. South Parnellia. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- BHPBIO (2009b) Advice to the assessing officer, received on 14 September 2009, BHP Billiton Iron Ore Pty Ltd.
- BHPBIO (2009c) Exploration Environmental Management Plan. PLN-IEN-ENV-003. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- CALM (2002) A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002. Department of Conservation and Land Management, Western Australia.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- ENV Australia (2009) Jinayri Geotechnical and Sterilisation Program: Flora and Vegetation Assessment. ENV Australia Pty Ltd, Western Australia.
- EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Onshore and Biologic (2009) Biological Survey. South Parnellia Exploration Leases. Onshore Environmental Consultants Pty Ltd and Biologic Environmental Science, Western Australia.
- Shepherd, D.P. (2007). Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Van Vreeswyk, A.M., Payne, A.L., Leighton, K.A. & Hennig, P. (2004) Technical bulletin no. 92: An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, South Perth, Western Australia.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DMP	Department of Mines and Petroleum, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	<i>Environment Protection Act 1986</i> , Western Australia.
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia.
s.17	Section 17 of the <i>Environment Protection Act 1986</i> , Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1 Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2 Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3 Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4 Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [*Wildlife Conservation Act 1950*] :-

- Schedule 1 Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2 Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3 Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4 Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1 Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2 Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3 Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4 Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5 Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.