



1. Application details

1.1. Permit application details

Permit application No.: 2765/1
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, Special Lease for Mining Operations 3116/3687, Document I 154279 L, Lot 19 on Deposited Plan 48921, Lot 65 on Deposited Plan 48920; Special Lease for Mining Operations 3116/4028, Lots 92, 93, 94, 95, 96, 24, 25 & 26 on Deposited Plan 241430; Special Lease for Mining Operations 3116/6298, Document I 123599 L, Lot 141 on Deposited Plan 48923

Local Government Area: Shire of East Pilbara & Town of Port Hedland
Colloquial name: Walla Siding to Turner Camp Rail Duplication Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
358		Mechanical Removal	Railway construction and maintenance

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description The area applied to clear has been broadly mapped at a scale of 1:250,000 as:

Beard Vegetation Association 93 - Hummock grasslands, shrub steppe; kanji over soft spinifex; and

Beard Vegetation Association 619 - Medium woodland; River Gum (*Eucalyptus camaldulensis*) (GIS Database).

Ecologia Environment Pty Ltd (2008b) conducted a Level 1 flora and vegetation survey of the proposed rail duplication area and Rail Repeater Station Two lease between 4 and 8 April 2008 in order to describe finer scale vegetation types than those described by Beard vegetation mapping.

The flora and vegetation survey of the proposed rail duplication area consisted of 28 quadrats, each 50 metres x 50 metres (the standard size for surveys carried out in the Pilbara) (Ecologia Environment Pty Ltd, 2008a). In addition, 15 transects were walked through different vegetation types along the length of the proposed rail duplication to ensure that a representative species list was produced for the survey area. The following six vegetation units (associated with four distinct landforms) were described from the proposed rail duplication area (Ecologia Environment Pty Ltd, 2008b):

Sandy/rocky plain

1. Scattered *Corymbia hamersleyana* low trees, over open to moderately dense patches of mixed *Acacia* spp. high shrubs (including *A. ancistrocarpa*, *A. orthocarpa*, *A. pyrifolia*, *A. bivenosa* and *A. acradenia*), sometimes with *Petalostylis labicheoides* and *Grevillea wickhamii*, over mixed low shrubs dominated by *Acacia stellaticeps*, with moderately dense mixed *Triodia pungens*, *T. epactia*, *T. basedowii* and *T. lanigera* hummock and open to moderately dense patches of **Cenchrus ciliaris* tussock grasses;

2. Very scattered *Corymbia hamersleyana* and *Acacia* spp. high shrubs, dominated by *A. inaequilatera*, over moderately dense mixed *Triodia pungens*, *T. wiseana* and *T. basedowii* hummock grasses;

Creek bed/bank

3. Open patches of *Eucalyptus victrix* medium trees, over scattered *Acacia coriacea* subsp. *pendens* and sparse to open *Corymbia hamersleyana* low trees, over sparse **Aerva javanica* low shrubs, with varying mixed open **Cenchrus ciliaris*, *Themeda triandra* tussock and sometimes with moderately dense *Triodia lanigera* and *Triodia angusta* hummock grasses;

4. Occasional outcropping *Eucalyptus camaldulensis* var. *obtusa* and *E. victrix* medium trees, over scattered *Melaleuca argentea* low trees, over open to moderately dense *Acacia trachycarpa* high shrubs, sometimes with *A. pyrifolia*, *A. bivenosa* and *Melaleuca glomerata*, over varying open *Triodia pungens* hummock and **Cenchrus ciliaris* tussock grasses, sometimes with open mixed *Cyperus* spp. sedges;

Drainage channel

5. Sparse to open *Eucalyptus victrix* low to medium trees, over sparse mixed *Petalostylis labicheoides*, *Grevillea*

wickhamii, *Acacia trachycarpa* and *A. bivenosa* high shrubs, over sparse mixed medium and low shrubs, including *Stemodia grossa*, with sparse to open mixed *Chrysopogon fallax* and **Cenchrus ciliaris* tussock and sparse mixed *Triodia epactia*, *T. pungens* and *T. lanigera* hummock grasses; and

Ridgetop

6. Open *Acacia maitlandii* and *A. inaequilatera* high shrubs, sometimes over open *A. ancistrocarpa* medium shrubs, over open mixed low shrubs, dominated by *Acacia stellaticeps*, *Indigofera monophylla*, *Hybanthus aurantiacus* and *Pterocaulon sphacelatum*, with dense mixed *Triodia pungens* and *T. lanigera* hummock grass (Ecologia Environment Pty Ltd, 2008b).

The Rail Repeater Station Two lease area is only 2.3 hectares in total, and this was surveyed by two botanists grid searching the area by walking approximately 10 metres apart and zigzagging back and forth across the lease (Ecologia Environment Pty Ltd, 2008b). Two vegetation units associated with one landform type were recorded:

Rocky low hillslope

1. Scattered *Corymbia hamersleyana* low trees, over sparse to open mixed medium shrubs of *Grevillea wickhamii* subsp. *hispidula* high shrubs and *Acacia ancistrocarpa*, over moderately dense *Acacia acradenia* medium-low shrubs, over open *Bonamia rosea* low shrubs, with moderately dense *Triodia basedowii* hummock grass; and

2. Recently burnt area with sparse *Fimbristylis simulans* sedges and moderately dense *Triodia wiseana* hummock grass regrowth (Ecologia Environment Pty Ltd, 2008b).

Ecologia Environment Pty Ltd (2008c) undertook a Level 1 flora and vegetation survey of the Quarry Two lease area on 8 April 2008. The flora and vegetation survey consisted of 8 quadrats, each 50 metres x 50 metres. In addition, transects were walked through different vegetation types within the lease to ensure that a representative species list was produced for the survey area. The following five vegetation units (associated with three distinct landforms) were described from the Quarry Two lease area:

Sandy Plain

1. Open *Acacia pyrifolia* high shrubs, with sparse patches of *Acacia tumida* var. *tumida*, over moderately dense mixed *Pterocaulon sphacelatum*, *Indigofera monophylla* and *Corchorus lasiocarpus* subsp. *lasiocarpus* low shrubs, over moderately dense *Triodia epactia* hummock grass and sparse mixed tussock grasses;

2. Sparse *Acacia pyrifolia* high to medium shrubs, over scattered mixed low shrubs, over moderately dense *Triodia epactia* hummock grass;

3. Sparse *Corymbia hamersleyana* low trees, over moderately dense *Acacia colei* var. *colei* medium to high shrubs, over moderately dense *Cajanus cinereus* medium shrubs, over open mixed *Indigofera monophylla*, *Pterocaulon sphacelatum* and *Pluchea tetranthera* very low shrubs, with open *Chrysopogon fallax*, **Cenchrus ciliaris* tussock and moderately dense *Triodia epactia* hummock grasses;

Ferrous/granite low hill crest

4. Isolated *Acacia inaequilatera* low trees over sparse *Senna glutinosa* subsp. *glutinosa* and *Senna glutinosa* subsp. *pruinosa* medium to high shrubs, over sparse *Tephrosia* sp. *B Kimberley Flora* low shrubs, over moderately dense *Triodia epactia* hummock grasses; and

Granite Outcrop

5. Sparse *Terminalia canescens* low trees, over open *Acacia tumida* high shrubs, over moderately dense patches of mixed low shrubs (including *Corchorus lasiocarpus* subsp. *lasiocarpus*, *Pterocaulon serrulatum*, *Tephrosia* sp. *B Kimberley Flora* and *Abutilon* aff. *dioicum*; sometimes over open mixed *Cyperus squarrosus* and *Fimbristylis dichotoma* sedges, with moderately dense mixed *Triodia epactia* hummock and tussock grasses, dominated by *Aristida holathera* var. *holathera* (Ecologia Environment Pty Ltd, 2008c).

It is noted that BHP Billiton's clearing permit application includes approximately 12 hectares of the Quarry Two lease area (totalling approximately 55 hectares). Only the three vegetation units associated with the Sandy Plain landform unit described above occur in the application area (Ecologia Environment Pty Ltd, 2008a). The Ferrous/granite low hill crest and Granite Outcrop landform units (and associated vegetation units 4 and 5) occur throughout sections of the Quarry Two lease area which are not subject to this application.

Ecologia Environment Pty Ltd (2008d) undertook a Level 1 flora and vegetation survey of the Rail Repeater Station One lease area on 5 April 2008. Like Rail Repeater Station Two, this area is 2.3 hectares in size and was surveyed using the same methods. Three vegetation units (associated with two distinct landforms) were described:

Rocky ferrous hillslope

1. Scattered *Corymbia opaca* low trees, over open mixed *Acacia ancistrocarpa* and / or *A. inaequilatera* medium shrubs, sometimes over *Triumfetta maconochieana* dwarf shrubs, over moderately dense *Triodia pungens* hummock grass;

2. Scattered *Acacia inaequilatera* medium shrubs, over open *Triodia angusta* hummock grass; and

Sandy floodplain

3. Sparse to open *Corymbia opaca* low to medium trees, over scattered *Acacia ancistrocarpa* tall shrubs, over sparse *Carissa lanceolata* medium shrubs, over moderately dense *Acacia stellaticeps* low shrubs, with

moderately dense *Triodia lanigera* hummock grass (Ecologia Environment Pty Ltd, 2008d).

* = introduced flora species

Clearing Description

BHP Billiton Iron Ore Pty Ltd (BHP Billiton) has applied for a Purpose Permit to clear up to 358 hectares of native vegetation within a boundary of approximately 556 hectares (GIS Database). The proposed clearing involves duplicating a 67 kilometre section of the Newman to Port Hedland rail line between Walla Siding and Turner Camp, located approximately 61 - 128 kilometres south of Port Hedland. Associated works will include upgrading signalling infrastructure, installation of power and communications cabling, establishment of access roads, borrow pits, temporary construction site office facilities and laydown areas. In addition, three new dual track railway bridges will be constructed at Chinnamon Creek North, Chinnamon Creek South and Gillam Creek (Ecologia Environment Pty Ltd, 2008a).

A majority of the proposed vegetation clearing is within the existing rail lease (Special Lease 3116/3687) which is approximately 80 metres wide. A quarry lease (Special Lease 3116/6298) will be used to source borrow material and will accommodate the temporary construction site office facilities, laydown areas, and a mobile concrete batching plant due to the limited space available within the narrow rail corridor. Upgrades to Rail Repeater Stations One (located approximately 55 kilometres south of Port Hedland) and Two (located approximately 102 kilometres south of Port Hedland), both located on Special Lease 3116/4028, are also part of this clearing permit application (Ecologia Environment Pty Ltd, 2008a).

Vegetation clearing will be undertaken using mechanical means.

Vegetation Condition

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)

to

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994)

Comment

The vegetation condition rating was determined by Ecologia Environment Pty Ltd (2008b; 2008c; 2008d) during Level 1 flora and vegetation surveys of the proposed rail duplication area, Quarry Two lease and Rail Repeater Stations One and Two lease. Factors taken into consideration when determining the vegetation condition were: weeds, grazing, litter and ground disturbance (tracks and other cleared areas).

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 may be at variance to this Principle

The proposed clearing area is located 61 - 128 kilometres south of Port Hedland in the Chichester subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Chichester subregion is characterised by undulating granite and basalt plains with significant areas of basalt ranges. Plains support shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, whilst *Eucalyptus leucophloia* tree steppes occur on ranges (Kendrick and McKenzie, 2002).

Ecologia Environment Pty Ltd (2008b) recorded 205 flora taxa from 35 families and 97 genera during a flora and vegetation survey of the rail corridor between Walla Siding and Turner Camp. Floristic richness was comparable to other areas in the Pilbara, as suggested by comparison to other vegetation and flora surveys in the bioregion. For example, 153 flora taxa were recorded during the Walla to Bing Siding flora and vegetation survey where 16 quadrats and 10 transects were used to survey a shorter section of the rail corridor (39 kilometres) at the same time of the year (April 2008). Six vegetation units were described from four distinct landform types during the Walla Siding to Turner Camp survey, all of which are typical of vegetation units previously described for the Pilbara bioregion. Vegetation condition of the proposed rail duplication area was rated as 'degraded' as a result of disturbance in the form of existing access tracks either side of the existing rail formation, large numbers of introduced flora species and grazing by cattle (Ecologia Environment Pty Ltd, 2008b).

Ecologia Environment Pty Ltd (2008b) recorded 69 flora taxa from 24 families and 44 genera during a flora and vegetation survey of the Rail Repeater Station Two lease area. Floristic richness was comparable to other areas in the Pilbara, as suggested by comparison to other vegetation and flora surveys in the bioregion. For example, 70 flora taxa were recorded at the Rail Repeater Station One lease, an area of similar size and disturbance level. Two vegetation units were described from one distinct landform type at Repeater Two, both of which are typical of vegetation units previously described for the Pilbara bioregion. Vegetation condition of the Repeater Two lease area was rated as 'good', with low levels of disturbance, few introduced flora species and limited evidence of grazing. However, a large section was noted to have been burnt in the 12 months preceding the survey (Ecologia Environment Pty Ltd, 2008b).

Ecologia Environment Pty Ltd (2008c) recorded 94 flora taxa from 32 families and 41 genera during a flora and vegetation survey of the Quarry Two lease area. Floristic richness was comparable to other areas in the Pilbara, as suggested by comparison to other vegetation and flora surveys in the bioregion. For example, 71 flora taxa were recorded during a survey of the Quarry One lease on 2 April 2008, whilst 88 flora taxa were recorded at the Quarry Eight drainage area during a flora survey conducted on 2 April 2008. Five vegetation units were described from three distinct landform types at Quarry Two, however clearing is only proposed on the Sandy plain landform unit, which is characterised by vegetation associations typical of the local and

regional area. The proposed clearing on the Quarry Two lease also includes disturbed areas such as existing access tracks and laydown areas which contribute little or no biodiversity value.

Ecologia Environment Pty Ltd (2008d) recorded 70 taxa from 27 families and 47 genera during a flora and vegetation survey of the Rail Repeater Station One lease area. Floristic richness was comparable to other areas in the Pilbara, as suggested by comparison to other vegetation and flora surveys in the bioregion. For example, 86 flora taxa were recorded at the Repeater Nine lease, an area of similar size and disturbance level. Three vegetation units were described from two distinct landform types at Repeater One, all of which are typical of vegetation units previously described for the Pilbara bioregion. Vegetation condition of the Repeater One lease area was generally rated as 'good', with minimal disturbance present from introduced flora species, grazing, tracks and litter (Ecologia Environment Pty Ltd, 2008d). However, areas along the rail and repeater access roads were rated as degraded and were characterised by significant land disturbance, weed invasion and grazing (Ecologia Environment Pty Ltd, 2008d).

Six introduced flora species were recorded in the proposed clearing area (Ecologia Environment Pty Ltd, 2008a). These included: Buffel Grass (*Cenchrus ciliaris*), Kapok Bush (*Aerva javanica*), Couch Grass (*Cynodon dactylon*), Stinking Passionflower (*Passiflora foetida*), Pigweed (*Portulaca oleracea*) and Puncture Vine (*Tribulus terrestris*). Kapok Bush occurs almost continuously along the length of the proposed rail duplication at a cover of between 2 and 10%, whilst Buffel Grass was observed to be continuous at a cover of between 2 and 70% (Ecologia Environment Pty Ltd, 2008a). The remaining four introduced flora species were recorded at low densities at various locations in the proposed clearing area. In general, introduced species were common to the rail corridor and were typically confined to access tracks and disturbed areas at Rail Repeater Stations One and Two. Introduced flora species at Quarry Two were mostly confined to disturbed areas surrounding the existing quarry, however these are outside of the area subject to this clearing permit application (Ecologia Environment Pty Ltd, 2008a).

The presence of introduced species diminishes the biodiversity value of the proposed clearing area. Care needs to be taken to ensure that vehicles and machinery brought onto the rail lease, Repeater Stations One and Two leases and the Quarry Two lease do not introduce weeds to non-infested areas. The most effective way of achieving this is to ensure that all vehicles and machinery are thoroughly cleaned to remove soil, plant matter and propagules prior to entering the leases subject to this clearing permit application. Should a clearing permit be granted, it is recommended that appropriate conditions be imposed to minimise the risk of clearing operations spreading or introducing weeds to non-infested areas.

From a faunal perspective, Ecologia Environment Pty Ltd (2008e) report that no significant impacts to biodiversity are anticipated. Whilst a number of fauna species indigenous to Western Australia are expected to use habitat within the proposed clearing area, this is not considered significant habitat. Conservation significant fauna are unlikely to utilise the numerous fauna habitats within the rail lease, which are generally degraded, subject to regular traffic from vehicles and trains and secondary impacts such as dust and noise (Ecologia Environment Pty Ltd, 2008e).

Landforms encountered during fauna surveys of the rail corridor included open plains, scattered granite tors and occasional major creeklines. These are typical of those of the surrounding Abydos plain. Despite having some intact vegetation in 'excellent' condition, approximately 75% of Rail Repeater Station Two had been burnt in the 12 months preceding the survey and consequently provided very little suitable habitat for fauna. Rail Repeater Station One contains habitat that is generally in good condition and well represented on a local and regional basis (Ecologia Environment Pty Ltd, 2008g). The Quarry Two lease area provides unique 'man-made' habitat where a quarry has been excavated from a granite rise with emergent boulders. This area is particularly important in providing den sites for the Northern Quoll (*Dasyurus hallucatus*), a conservation significant species (Ecologia Environment Pty Ltd, 2008h). This important quarry area has been excluded from the clearing permit application. Much of the western extent of the Quarry Two lease area (subject to this clearing permit application) is characterised by low Acacia shrublands on sandy loam, habitat that is well represented in the local and regional area (Ecologia Environment Pty Ltd, 2008f).

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

Should a clearing permit be granted, it is recommended that suitable conditions be imposed for the purposes of weed management and rehabilitation, and to ensure that impacts to the Northern Quoll are avoided, minimised and managed.

Methodology

Ecologia Environment Pty Ltd (2008a).
Ecologia Environment Pty Ltd (2008b).
Ecologia Environment Pty Ltd (2008c).
Ecologia Environment Pty Ltd (2008d).
Ecologia Environment Pty Ltd (2008e).
Ecologia Environment Pty Ltd (2008f).
Ecologia Environment Pty Ltd (2008g).
Ecologia Environment Pty Ltd (2008h).
Kendrick and McKenzie (2002).
GIS Database:
- Interim Biogeographic Regionalisation for Australia (Subregions).

(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

Ecologia Environment Pty Ltd (2008e; 2008f; 2008g) undertook Level one vertebrate fauna assessments of the proposed Walla – Turner Camp rail duplication, Quarry Two and Rail Repeater Stations One and Two lease areas subject to this clearing permit application in April and May 2008. The assessments involved desktop database searches and literature reviews prior to field reconnaissance in order to compile potential species inventories for the study sites. The following databases and references were consulted:

- Western Australian Museum Faunabase;
- Birds Australia Birdata;
- Department of Environment and Conservation (DEC) Threatened Fauna database;
- Department of Environment and Water Protected Matters database;
- field guides for birds, mammals, reptiles and amphibians; and
- other vertebrate fauna assessments in the local area, including several of the Newman – Port Hedland Mainline rail lease.

Desktop studies revealed that 212 vertebrate fauna species may potentially occur in the areas subject to this clearing permit application (Ecologia Environment Pty Ltd, 2008a).

Field reconnaissance of the proposed Walla – Turner Camp duplication area and Rail Repeater Station Two lease area was undertaken between 6 and 9 May 2008. The main objectives of the field reconnaissance included:

- to provide a description of the main habitat types;
- to look for species of conservation significance;
- to undertake a risk assessment to determine likely impacts and threatening processes on vertebrate fauna; and
- to make recommendations to minimise impacts to fauna (Ecologia Environment Pty Ltd, 2008e).

Methods employed during the field reconnaissance included:

- walking transects through the project area to provide a description of the major habitat types;
- conducting 20 minute avifauna surveys in selected 2 hectare areas throughout all of the major habitat types encountered;
- opportunistic sightings of fauna;
- hand searching opportunistic sites. This involved searching for cryptic fauna by over-turning logs and stones, breaking open old logs and dead free-standing trees and searching burrows;
- looking for secondary evidence of fauna such as scats, tracks, diggings and burrows; and
- spotlighting using vehicle-mounted spotlights and head torches to record nocturnal fauna (Ecologia Environment Pty Ltd, 2008e).

Five major fauna habitats were identified from the proposed rail duplication area:

1. Sandy/rocky plain with scattered low trees, over moderately dense Acacia high shrubs over mixed low shrubs and *Triodia* grasses;
2. Creek bed/bank with medium Eucalypt trees over open *Corymbia* trees over sparse low shrubs and grasses;
3. Drainage channel with sparse to open Eucalypts over sparse high and medium shrubs over sparse tussock and hummock grasses;
4. Ridgetop with Acacia high shrubs over open mid to low shrubs with dense *Triodia* hummock grass; and
5. Granite outcropping surrounded by small Eucalypts, mixed medium Acacia trees and shrubs over dense spinifex (Ecologia Environment Pty Ltd, 2008e).

Two major fauna habitats were identified from the Rail Repeater Station Two lease area:

1. Scattered *Corymbia* low trees, over sparse to open mixed medium and high, over moderately dense Acacia medium-low shrubs, over open low shrubs, with moderately dense *Triodia* hummock grass; and
2. Recently burnt area with sparse *Fimbristylis simulans* sedges and moderately dense *Triodia* hummock grass regrowth (Ecologia Environment Pty Ltd, 2008e).

Ecologia Environment Pty Ltd (2008e) concluded that that the proposed rail duplication and Rail Repeater Station Two lease areas were largely comprised of land systems and vegetation types that are well represented both locally and regionally. There will be an unavoidable loss of biodiversity as a result of vegetation clearing for the proposed rail duplication. Loss of local vertebrate communities, loss of ecological function, displacement of local fauna into surrounding areas (where they will face increased competition), mortality (during clearing or vehicle strike), noise, dust, accidental fire, and increases in feral fauna are all likely

impacts of the proposed vegetation clearing and subsequent construction activities.

Fauna most likely to be impacted by the proposed vegetation clearing include highly territorial species which are unlikely to leave the impact footprint even if the habitat is cleared, young mammals and birds still under parental care and species relying on a specialised habitat type where there is no suitable habitat nearby (Ecologia Environment Pty Ltd, 2008e). Young individuals of ground breeding birds such as the Australian Bustard (*Ardeotis australis*) or the Bush Stone-curlew (*Burhinus grallarius*) may be present at most times of the year as these species lay eggs from March to September and July to January respectively. Burrowing animals are also vulnerable to direct mortality during clearing operations, in addition to habitat loss, as they may be unlikely to vacate burrows if disturbed. Nocturnal snakes such as the Woma Python (*Aspidites ramsayi*) shelter in hollow logs, animal burrows or thick vegetation during the day and may also remain sheltered in response to clearing, thereby facing direct mortality (Ecologia Environment Pty Ltd, 2008e).

However, potential impacts to fauna are limited due to the linear nature of the proposed clearing, proximity to existing railway, associated infrastructure, access tracks and borrow pits (Ecologia Environment Pty Ltd, 2008a). Impacts of vegetation clearing in any given area will be localised to a relatively small area, not extending more than 40 metres from the existing railway line (Ecologia Environment Pty Ltd, 2008e). In addition, many fauna species have the ability to vacate the proposed clearing area at the onset of disturbance, especially transient bird species (Ecologia Environment Pty Ltd, 2008a).

Field reconnaissance of the Quarry Two lease area was undertaken on 7 May 2008. Five major habitats were identified during field reconnaissance of the Quarry Two lease area:

1. The disturbed area of the quarry, comprising rocky scree, vertical rocky cliffs, a semi-permanent pool of water with an embankment of soft soil, supporting very little vegetation;
2. Rocky granitic hill with numerous, naturally formed rocks with sparse trees and sparse Spinifex;
3. Sandy plain habitat with Acacia shrubs over moderately dense mixed shrub species and moderately dense spinifex. Occasional *Corymbia hamersleyana* low trees;
4. Ferrous/Granite low crest with isolated *Acacia inaequilatera* low trees over sparse senna shrubs and moderately dense Spinifex; and
5. Granite outcrops with sparse low trees, patches of Acacia shrubs and sparse Spinifex (Ecologia Environment Pty Ltd, 2008f).

A targeted survey for the Northern Quoll (*Dasyurus hallucatus*) was undertaken on the Quarry Two lease on 15 July 2008, during which probable den sites with scats present were found. A Northern Quoll was also observed during this survey (Ecologia Environment Pty Ltd, 2008f). The presence of the Northern Quoll at Quarry Two represents an important find as the species is listed as 'Endangered' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and as 'Schedule 1 - Fauna that is rare or likely to become extinct' in the *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*.

Northern Quolls are solitary marsupials that primarily feed on insects but also feed on mammals, birds, frogs, reptiles and flesh fruits when available. The species is arboreal, terrestrial and primarily nocturnal (Oakwood, 2002; 2008 cited in Ecologia Environment Pty Ltd; 2008h). Northern Quolls are known to inhabit dissected rocky escarpments, open forests of lowland savannah, woodland, around human settlements and occasionally in rainforest patches or on beaches throughout their distribution (Ecologia Environment Pty Ltd, 2008h). Northern Quolls are broadly distributed across the Pilbara bioregion and have recently been recorded at the BHP Billiton Goldsworthy minesite, Callawa exploration area (both approximately 175 kilometres east of Port Hedland), and at the Moly Mines Spinifex Ridge minesite (50 kilometres north-east of Marble Bar). Records of the Northern Quoll on the Abydos Plain (which includes this clearing permit application area) include a Level 2 fauna survey of the Fortescue Metals Group rail corridor, Hope Downs Rail Corridor and older records from Cadjeput Gorge and Edgina Granites. Northern Quolls have also been recently recorded by Ecologia Environment Pty Ltd during surveys of the 'Quarry One' and 'Quarry Three' leases, located approximately 29 and 132 kilometres south of Port Hedland respectively (Ecologia Environment Pty Ltd, 2008h).

The Quarry Two lease area covers approximately 55 hectares. This clearing permit application includes approximately 12.19 hectares confined to the western portion of the Quarry Two lease area, immediately adjacent to the existing railroad access track (Ecologia Environment Pty Ltd, 2008a). Ecologia Environment Pty Ltd (2008f) noted that much of the western portion of the Quarry Two lease area is characterised by low Acacia shrubland on sandy loam. Of the five main habitats present within the Quarry Two lease area (identified above), only habitat type three (sandy plain) is present within the proposed clearing area.

Aerial photography and vegetation mapping provided by Ecologia Environment Pty Ltd (2008c) indicates that the 12.19 hectare area of clearing proposed for Quarry Two is characterised by existing disturbance in the form of access tracks and laydown areas. Sandy plain vegetation units which are well represented both locally and regionally are proposed for clearing. Unique 'man-made' habitat associated with the quarry itself has been excluded. Granite outcrops, tors and rockpiles which provide denning habitat for the Northern Quoll have also been excluded. No clearing will occur within approximately 100 metres of probable Northern Quoll den sites which were identified by Ecologia Environment Pty Ltd (2008f).

BHP Billiton has developed a Northern Quoll Management Plan ("*Rail Expansion Project – Northern Quoll Management Plan - Revision 2*") in consultation with DEC and DoIR, to be implemented during the current Newman to Port Hedland rail duplication project. Some of the key management actions outlined in this document include (Ecologia Environment Pty Ltd, 2008h):

- Conduct targeted pre-disturbance surveys of habitat identified as potentially containing Northern Quoll den sites. Annual trapping surveys will be conducted in April/May for the duration of the construction activities in the vicinity of probable den sites, and for one year following cessation of construction activities;
- Maintain a minimum 50 metre buffer between probable Northern Quoll den sites and clearing/construction activities where practicable;
- If probable Northern Quoll den sites will be disturbed, develop trapping and relocation procedures, in consultation with DEC;
- Minimise night-time activities in the vicinity of probable Northern Quoll den sites where practicable;
- Use directional lighting to minimise light overspill and illumination of probable den sites (if night time activity must be undertaken to meet operational and scheduling requirements).

Other key actions include:

- Site induction for contractors and personnel to include information on minimisation of impact on Northern Quolls. This will include education on the location of probable den sites, the importance of adherence to speed limits to minimise the potential for road kills, prohibition of Northern Quolls being captured or fed by personnel and appropriate waste storage and disposal to discourage Northern Quolls from work areas;
- Putrescible waste to be stored in lidded waste receptacles and removed from site regularly;
- Conduct activities in accordance with the *Environmental Protection (Noise Regulations 1997)*;
- Northern Quoll death or injury must be reported as an environmental event;
- An event investigation must be conducted within 72 hours of an event occurring;
- Northern Quoll mortality must be reported to DEC Pilbara Regional Office within 72 hours of the event occurring; and
- Implement preventive and corrective actions appropriate to the nature and scale of the environmental event, reducing the probability of re-occurrence (Ecologia Environment Pty Ltd, 2008h).

BHP Billiton will monitor the implementation of management controls outlined in the Northern Quoll Management Plan via weekly inspections of work areas and quarterly environmental audits. The effectiveness of the management plan will be reviewed quarterly and as required in the event of Northern Quoll mortality or injury. Reports will be provided to DEC and other government agencies as required, detailing the results of annual monitoring surveys, any recorded Northern Quoll deaths and the status on the implementation of management measures (Ecologia Environment Pty Ltd, 2008h).

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

Should a clearing permit be granted, it is recommended that suitable conditions be imposed to ensure that impacts to the Northern Quoll are avoided, minimised and managed.

Methodology Ecologia Environment Pty Ltd (2008a).
Ecologia Environment Pty Ltd (2008c).
Ecologia Environment Pty Ltd (2008e).
Ecologia Environment Pty Ltd (2008f).
Ecologia Environment Pty Ltd (2008g).
Ecologia Environment Pty Ltd (2008h).

(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**

According to available databases, there are no known records of Declared Rare Flora (DRF) or Priority Flora within the proposed clearing area (GIS Database). Ecologia Environment Pty Ltd (2008b; 2008c; 2008d) did not record any DRF or Priority Flora species during flora and vegetation surveys of the proposed rail duplication area, Quarry Two lease or the Rail Repeater Stations One and Two leases.

Two DRF and 98 Priority Flora species are known from the Pilbara bioregion (Ecologia Environment Pty Ltd,

2008b). Based on habitat preferences and known distributions, 15 Priority species could potentially occur in the proposed clearing area. However, only *Themeda sp. Hamersley Station* (P3) has previously been recorded in the vicinity of the proposed clearing area according to available information (Ecologia Environment Pty Ltd, 2003; cited in Ecologia Environment Pty Ltd, 2008b). No other Priority Flora taxa or DRF have been recorded in other surveys undertaken in the area (Biota, 2004; Biota & Trudgen, 2002; Ecologia Environment Pty Ltd, 2002a; 2002b; cited in Ecologia Environment Pty Ltd; 2008b).

During the flora and vegetation survey of the proposed rail duplication area, Ecologia Environment Pty Ltd (2008b) recorded a number of flora taxa which were not identifiable to species level. This was largely attributed to insufficient fruiting material (seeds) to enable identification. Two species of interest were recorded (*Euphorbia aff. australis* type 1 and *Sida aff. clementii*) which may represent new taxa (Ecologia Environment Pty Ltd, 2008b). Neither species is listed as DRF or Priority Flora.

The vegetation communities present within the proposed clearings area are typical of those found within the Chichester subregion, as described by Kendrick (2001) and Beard (1975); cited in Ecologia Environment Pty Ltd (2008b). It is not expected that the proposed clearing will result in a loss of significant habitat necessary for the continued existence of DRF or Priority Flora species.

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

Methodology Ecologia Environment Pty Ltd (2008b).
Ecologia Environment Pty Ltd (2008c).
Ecologia Environment Pty Ltd (2008d).
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 known Threatened Ecological Communities (TEC's) in the proposed clearing areas (GIS Database). Ecologia Environment Pty Ltd (2008b; 2008c; 2008d) did not record any TEC's or Priority Ecological Communities (PEC's) during flora and vegetation surveys of the proposed rail duplication area, Quarry Two lease and Rail Repeater Stations One and Two leases. According to available databases, the nearest known TEC is located approximately 145 kilometres south-west of the southern extent of the proposed rail duplication area (GIS Database).

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

Methodology Ecologia Environment Pty Ltd (2008b).
Ecologia Environment Pty Ltd (2008c).
Ecologia Environment Pty Ltd (2008d).
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 area applied to clear is within the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara bioregion (GIS Database). According to Shepherd et al (2001) there is approximately 99.9% of the pre-European vegetation remaining in the Pilbara bioregion. The vegetation of the application area is classified as Beard Vegetation Association 93 - Hummock grasslands, shrub steppe; kanji over soft spinifex and Beard Vegetation Association 619 - Medium woodland; River Gum (*Eucalyptus camaldulensis*).

There is approximately 100% of the pre-European vegetation remaining of Beard Vegetation Associations 93 and 619 in the Pilbara bioregion (Shepherd et al, 2001). These vegetation types are poorly represented within conservation reserves at both the state and bioregional level (see table below). The area proposed to clear does not represent a significant remnant of vegetation in the wider regional area. The proposed clearing will not reduce the extent of Beard Vegetation Associations 93 or 619 below current recognised threshold levels, below which species loss increases significantly.

It is acknowledged that iron ore mining activities in the Pilbara have resulted in an increase of native vegetation clearing at the bioregional scale in recent years. This trend is expected to continue with proposed BHP Billiton and Rio Tinto expansion projects. It will therefore become increasingly important in the future to consider the cumulative impacts of native vegetation clearing both locally and regionally.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~99.9	least concern	6.3
Beard veg assoc. – State					
93	3,044,326	3,044,267	~100	least concern	0.4
619	119,159	119,038	~100	least concern	0.2
Beard veg assoc. – Bioregion					
93	3,042,131	3,042,082	~100	least concern	0.4
619	118,706	118,706	~100	least concern	0.2

* Shepherd et al. (2001) updated 2005

** 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).
Shepherd et al (2001).
GIS Databases:
- 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

According to available databases, there are no known ANCA wetlands, RAMSAR wetlands or Wild Rivers within the proposed clearing area (GIS Database). The proposed rail duplication will involve the construction of three new dual track bridges to cross Chinnamon Creek North, Chinnamon Creek South and Gillam Creek (and the removal of the existing bridges). Sixty four existing culverts will be extended beneath the proposed rail duplication at areas of minor drainage and sheet flow, whilst 12 new culverts will also be installed (Ecologia Environment Pty Ltd, 2008a).

Three distinct vegetation units associated with watercourses were identified by Ecologia Environment Pty Ltd (2008b) during a flora and vegetation survey of the proposed rail duplication area:

Vegetation Unit 3 - Open patches of *Eucalyptus victrix* medium trees, over scattered *Acacia coriacea* subsp. *pendens* and sparse to open *Corymbia hamersleyana* low trees, over sparse *Aerva javanica* low shrubs, with varying mixed open *Cenchrus ciliaris*, *Themeda triandra* tussock and sometimes with moderately dense *Triodia lanigera* and *Triodia angusta* hummock grasses;

Vegetation Unit 4 - Occasional outcropping *Eucalyptus camaldulensis* var. *obtusa* and *E. victrix* medium trees, over scattered *Melaleuca argentea* low trees, over open to moderately dense *Acacia trachycarpa* high shrubs, sometimes with *A. pyrifolia*, *A. bivenosa* and *Melaleuca glomerata*, over varying open *Triodia pungens* hummock and *Cenchrus ciliaris* tussock grasses, sometimes with open mixed *Cyperus* spp. sedges; and

Vegetation Unit 5 - Sparse to open *Eucalyptus victrix* low to medium trees, over sparse mixed *Petalostylis labicheoides*, *Grevillea wickhamii*, *Acacia trachycarpa* and *A. bivenosa* high shrubs, over sparse mixed medium and low shrubs, including *Stemodia grossa*, with sparse to open mixed *Chrysopogon fallax* and *Cenchrus ciliaris* tussock and sparse mixed *Triodia epactia*, *T. pungens* and *T. lanigera* hummock grasses.

Approximately three hectares, six hectares and 12 hectares of Vegetation Units 3 - 5 are proposed for clearing respectively (Ecologia Environment Pty Ltd, 2008a). In total, this represents 21 hectares of riparian vegetation, or approximately 6% of the total area (358 hectares) applied to clear. No distinct vegetation units associated with watercourses or wetlands were recorded by Ecologia Environment Pty Ltd (2008c; 2008d) during flora and vegetation surveys of the Quarry Two lease and the Rail Repeater Station One and Rail Repeater Station Two leases.

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

Ecologia Environment Pty Ltd (2008a) notes that Vegetation Units 3 -5 are well represented across the Pilbara bioregion. Should a clearing permit be granted, there will be an unavoidable loss of approximately 21 hectares of riparian vegetation from these three vegetation units combined. It is acknowledged that the clearing includes non-native species such as Buffel Grass (a dominant species of the ground layer in all three vegetation units) and Kapok Bush (present in the shrub layer in Vegetation Unit 3). The proximity of the riparian vegetation to the existing rail formation, access tracks and associated infrastructure is also likely to have impacted upon the condition of the riparian vegetation.

Methodology Ecologia Environment Pty Ltd (2008a).
Ecologia Environment Pty Ltd (2008b).
Ecologia Environment Pty Ltd (2008c).
Ecologia Environment Pty Ltd (2008d).
GIS Database:
- ANCA Wetlands.
- Hydrography, linear.
- RAMSAR Wetlands. - Wild Rivers (Priority).

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

Comments Proposal may be at variance to this Principle

Land system mapping by the Department of Agriculture Western Australia has mapped a variety of 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 proposed clearing areas include seven different land systems (GIS Database). A broad description of each land system is given below:

1. Macroy - The Macroy land system is characterised by stony plains and occasional tor fields based on granite supporting hard and soft spinifex grasslands. This land system has low or very low erosion hazard (Van Vreeswyk et al, 2004). Approximately 258 hectares of the proposed clearing is within this land system (Ecologia Environment Pty Ltd, 2008a).

2. Uaroo - The Uaroo land system is characterised by broad sandy plains supporting shrubby hard and soft spinifex grasslands. Erosion is occasionally evident on drainage tracts, but this land system is generally not susceptible to erosion (Van Vreeswyk et al, 2004).). Approximately 52 hectares of the proposed clearing is within this land system (Ecologia Environment Pty Ltd, 2008a).

3. Boolaloo – The Boolaloo land system is characterised by granite hills, domes and tor fields and sandy plains with shrubby spinifex grasslands. The susceptibility of this land system to erosion has not been reported by Van Vreeswyk et al (2004). Approximately 28 hectares of the proposed clearing is within this land system (Ecologia Environment Pty Ltd, 2008a).

4. River - The River land system is characterised by active flood plains and major rivers supporting grassy Eucalypt woodlands, tussock grasslands and soft spinifex grasslands. This land system is largely stabilised by Buffel Grass and spinifex, therefore accelerated erosion is uncommon. However, susceptibility to erosion is high or very high if vegetative cover is removed (Van Vreeswyk et al, 2004). Approximately 8 hectares of the proposed clearing is within this land system (Ecologia Environment Pty Ltd, 2008a).

5. Boolgeeda – The Boolgeeda land system is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and Mulga shrublands. Vegetation is generally not prone to degradation and this land system is not susceptible to erosion (Van Vreeswyk et al, 2004). Approximately 7 hectares of the proposed clearing is within this land system (Ecologia Environment Pty Ltd, 2008a).

6. Robe - The Robe land system is characterised by low limonite mesas and buttes supporting soft spinifex (and occasionally hard spinifex) grasslands. This land system is not generally susceptible to erosion (Van Vreeswyk et al, 2004). Approximately 5 hectares of the proposed clearing is within this land system (Ecologia Environment Pty Ltd, 2008a).

7. Platform – The Platform land system is characterised by dissected slopes and raised plains supporting hard spinifex grasslands. This land system is not susceptible to erosion (Van Vreeswyk et al, 2004). Approximately 1 hectare of the proposed clearing is within this land system (Ecologia Environment Pty Ltd, 2008a).

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

The proponent will implement the following strategies to minimise land degradation risks associated with vegetation clearing:

- All cleared vegetation will be stockpiled for later use in rehabilitation. To minimise disturbance, stockpiles will be located on already cleared or disturbed areas where practicable;
- Topsoil will be stripped to a depth of 50 - 100 millimetres and stockpiled to a height no greater than 1.5 metres for later use in rehabilitation. To minimise disturbance, stockpiles will be located on already cleared or disturbed areas where practicable;
- Approximately 216 hectares of the 358 hectares proposed for disturbance will be of a temporary nature. Borrow pits will be rehabilitated progressively, whilst laydown areas will be rehabilitated post construction;
- Surface water run-off from work areas shall be contained in sumps to prevent pollution and erosion.

Sumps shall be filled and rehabilitated upon completion of works. Bunding will also be used where necessary to prevent sediment releases off site.

- Where the potential for erosion is high, appropriate methods for erosion control will be used (such as gabions, rip rap rock protection and reno mattresses). Designers for the civil works will determine erosion potential based on floodway reports and standard engineering experience. Rock protection is provided as a general specification in culvert design, and will be used in all culverts installed during construction. Post construction quality assurance monitoring will identify any additional erosion control which may be required (Ecologia Environment Pty Ltd, 2008a).

Should a clearing permit be granted, suitable conditions should be imposed with respect to erosion management. This is particularly the case where clearing is proposed in areas vulnerable to erosion, such as drainage lines.

Methodology Ecologia Environment Pty Ltd (2008a).
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

There are no conservation reserves in close proximity to the proposed clearing areas (GIS Database). The nearest known conservation reserve is the Mungaroona Range Nature Reserve, located approximately 70 kilometres west of the southern extent of the proposed rail duplication area (GIS Database).

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

A number of ephemeral drainage lines dissect the proposed rail duplication area, including Chinnamon Creek North, Chinnamon Creek South and Gillam Creek (Ecologia Environment Pty Ltd, 2008a). It is proposed that three new dual track rail bridges will be constructed to cross these drainage lines, whilst 64 existing culverts will be extended beneath the proposed rail duplication. In addition, 12 new culverts will be installed at various minor drainage features and areas of sheet flow along the 67 kilometre length of the proposed rail duplication (Ecologia Environment Pty Ltd, 2008a). Engineering structures such as bridges and culverts will be used by the proponent to ensure natural surface water flow regimes are reinstated following duplication of the railway line.

During clearing, there is a potential for surface water quality to be impacted by sedimentation should adequate management measures not be put in place. BHP Billiton will implement the following strategies to avoid, minimise and mitigate impacts to surface water quality (Ecologia Environment Pty Ltd, 2008a):

- Surface water run-off from work areas shall be contained in sumps. Bunding will also be used where necessary to prevent sediment releases off site;
- Where the potential for erosion is high, appropriate methods for erosion control will be used (such as gabions, rip rap rock protection and reno mattresses). Designers for the civil works will determine erosion potential based on floodway reports and standard engineering experience. Rock protection is provided as a general specification in culvert design, and will be used in all culverts installed during construction. Post construction quality assurance monitoring will identify any additional erosion control which may be required;
- Topsoil and cleared vegetation shall be stockpiled away from watercourses; and
- Contractors shall maintain a minimum 50 metre set back from drainage lines for disturbances unless otherwise approved.

The proposed clearing area is not located within a Public Drinking Water Source Area (GIS Database). A majority of the proposed vegetation clearing is within a linear, 80 metre wide rail corridor spanning some 67 kilometres. It is unlikely that vegetation clearing would result in any significant changes to local groundwater levels or quality.

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

Methodology Ecologia Environment Pty Ltd (2008a).
GIS Database:

- Public Drinking Water Source Areas (PDWSAs).

(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 in the Pilbara bioregion, an arid environment characterised by two distinct seasons; a hot Summer from October to April and a mild Winter from May to September. Peak rainfall typically occurs in the Summer months and is associated with tropical cyclones. A smaller rainfall peak is experienced between May and June and is associated with cold fronts. The average annual rainfall of Port Hedland is approximately 313 millimetres. Annual evaporation rates in the Pilbara bioregion greatly exceed average annual rainfall (Ecologia Environment Pty Ltd, 2008a).

A number of ephemeral drainage lines dissect the proposed clearing area, including Chinnamon Creek North, Chinnamon Creek South and Gillam Creek (Ecologia Environment Pty Ltd, 2008a). It is proposed that three new dual track rail bridges will be constructed to cross these drainage lines, whilst the existing bridges will be removed. In addition, 64 culverts will be duplicated at numerous minor drainage lines and areas of sheet flow along the 67 kilometre length of the proposed rail duplication (Ecologia Environment Pty Ltd, 2008a). Bridge and culvert installation will ensure that the proposed vegetation clearing and subsequent construction activities do not impede natural surface water flow.

With respect to the Quarry Two lease area and the Rail Repeater Stations One and Two leases, there are no drainage lines present (GIS Database; Ecologia Environment Pty Ltd, 2008a).

Whilst natural flood events do occasionally occur in the Pilbara following cyclonic activity, the proposed clearing of 358 hectares of native vegetation is not expected to increase the incidence or intensity of such events given the size of the area to be cleared (358 hectares) in relation to the size of the Turner River catchment (480,185 hectares) in which clearing is proposed (GIS Database).

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

Methodology Ecologia Environment Pty Ltd (2008a).
GIS Database:
- Hydrographic Catchments - Catchments.
- Hydrography, linear.

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

Comments

There is one native title claim over the area under application (GIS Database). This claim (WC99_003) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). However, the mining tenements have 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 30 registered Sites of Aboriginal Significance within 2 kilometres of the proposed clearing areas (Ecologia Environment Pty Ltd, 2008a). The proposed clearing intersects the buffer zone of three of these sites (Ecologia Environment Pty Ltd, 2008a). Recent ethnographic surveys have been undertaken by the traditional owners of the land, confirming that there are no registered sites within the proposed clearing areas (Ecologia Environment Pty Ltd, 2008a). 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.

Methodology Ecologia Environment Pty Ltd (2008a).
GIS Databases:
- Aboriginal Sites of Significance.
- Native Title Claims.

4. Assessor's comments

Comment

The proposal has been assessed against the Clearing Principles, and the proposed clearing is at variance to Principle (f), may be at variance to Principles (a), (b) and (g), is not likely to be at variance to Principles (c), (d), (h), (i) or (j) and is not at variance to Principle (e).

Should a clearing permit be granted, it is recommended that conditions be imposed on the permit for the purposes of minimising impacts to the Northern Quoll, erosion control, weed management, record keeping and permit reporting.

5. References

- 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.
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- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Kendrick, P., and McKenzie, N. (2002) Pilbara 1 (PIL1 - Chichester subregion) in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002'. Department of Conservation and Land Management, Western Australia.
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- 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.
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	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (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	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, 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.