



1. Application details

1.1. Permit application details

Permit application No.: 2118/1
 Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: State Agreement Act, Mining Lease 266SA (AM 70/266)
 Local Government Area: Shire of East Pilbara
 Colloquial name: Jimblebar Communications Tower

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>The area applied to clear has been broadly mapped at a scale of 1:250000 as: Beard Vegetation Association 82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> (GIS Database).</p> <p>ENV Australia (2007) mapped the following landform and vegetation associations within the proposed clearing area:</p> <p>1. Rocky hills - Mixed scattered Acacia - <i>Triodia basedowii</i> open grassland on rocky hills;</p> <p>2. Slopes - Mixed Acacia over <i>Triodia basedowii</i> - <i>Cymbopogon obtectus</i> grassland on slopes;</p> <p>3. Plains - <i>Eucalyptus gamophylla</i> - <i>Acacia aneura</i> over <i>Aristida ingrata</i> - <i>Aristida holathera</i> var. <i>latifolia</i> grassland plains; and</p> <p>4. Small drainage - <i>Eucalyptus leucophloia</i> ssp. <i>leucophloia</i> - mixed <i>Acacia</i> spp. over <i>Triodia basedowii</i> - <i>Cymbopogon obtectus</i> woodland on small drainage.</p>	<p>This clearing permit application is for a Purpose Permit to clear up to 1.3 hectares within a boundary of approximately 7.25 hectares (GIS Database). The proposed clearing will allow the proponent to construct a radio communications tower approximately 700 metres south of the existing Jimblebar Mine, located approximately 40 kilometres east of Newman in the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion. Infrastructure associated with the communications tower will include:</p> <ul style="list-style-type: none"> a temporary transportable building; 90 metre guyed radio and microwave antennas; power generator; 5000 litre fuel tank within a bunded compound; and single access road, vehicle parking and turnaround areas (BHP Billiton, 2007). 	<p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994)</p> <p>to</p> <p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)</p>	<p>The proposed clearing area is located on the Sylvania Pastoral Lease (GIS Database) and consequently some minimal trampling of vegetation by cattle was noted by ENV Australia (2007) during a flora and vegetation survey of the area.</p> <p>Two introduced flora species were recorded within the proposed clearing area by ENV Australia (2007).</p>

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 approximately 40 kilometres east of Newman in the Fortescue Plains subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Fortescue Plains subregion is characterised by alluvial plains and river frontage (CALM, 2001). Extensive salt marsh, bunch grass and short grass communities on alluvial plains are dominant features in the east of the subregion, whilst deeply incised gorges exist in the lower west (CALM, 2001). Large permanent wetlands supporting river gum communities are a feature of the central Fortescue (CALM, 2001). The climate is semi desert tropical, with an average annual rainfall of approximately 300 millimetres (CALM, 2001). Dominant land uses of the Fortescue subregion include grazing, native pastures, unallocated crown land and crown reserves, conservation and Aboriginal leases (CALM, 2001).

ENV Australia (2007) undertook a flora survey of the proposed clearing area in April 2007 and noted that the vegetation communities recorded had been described in a number of previous flora surveys (including a flora and vegetation assessment of the Jimblebar rail loop and Orebody 25 mine site). ENV Australia (2007) also compared the species richness of the radio communications tower survey area to that of the Jimblebar rail loop and Orebody 25 mine site surveys by comparing the average number of plant taxa recorded per quadrat. The results were as follows:

- radio communications tower survey - 20.8 (species per quadrat);
- Jimblebar rail loop survey - 32.0; and
- Orebody 25 mine site survey - 16.6.

Therefore, in comparison to similar vegetation communities within the local area, the proposed clearing site does not contain a higher level of biological diversity (ENV Australia, 2007).

From a faunal perspective, five amphibians, 34 reptiles, 67 birds, seven native and six introduced mammal species have previously been recorded from the Jimblebar - Wheelarra Hill Mine site and surrounding areas (BHP Billiton, 2006). Given that these numbers have been derived from fauna surveys undertaken over several thousand hectares in the Jimblebar area, it is difficult to ascertain the faunal diversity of the small proposed clearing area. However, given that the habitat types within the proposed clearing area are not unique at a local or regional scale, it is unlikely that the area supports a higher level of faunal diversity than any other local or regional area.

A small drainage line located in the east of the proposed clearing area was discussed by ENV Australia (2007) as supporting riparian vegetation. Such vegetation often supports higher levels of biodiversity and available resources than the surrounding landscape, particularly in dryland environments such as the Pilbara (Sparks, 1995; Tubman & Price, 1999; Lynch & Catterall, 1999 cited in ENV Australia, 2007). It is recommended that no clearing be undertaken within this drainage line or its fringing vegetation to preserve what may be an area of higher biological diversity value. BHP Billiton (2007) have advised that no clearing will be undertaken within this drainage line.

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

Methodology BHP Billiton (2006).
BHP Billiton (2007).
CALM (2001).
ENV Australia (2007).

(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**

Ecologia Environment Pty Ltd conducted a fauna survey over most of the Jimblebar Mine disturbance area, and extended south to cover the current clearing permit application area (Ecologia Environment Pty Ltd, 2004 cited in BHP Billiton, 2007). The following five habitat types were identified during the survey (BHP Billiton, 2007):

1. Mesa top - Sparse trees of *Acacia aneura* (Mulga) and *Acacia rhodophloia* over moderately dense *Triodia basedowii* hummock grassland;
2. Rocky gully - Scattered *Eucalyptus leucophloia* low woodland over low shrubs over moderately dense *Triodia pungens* hummock grassland;
3. Riverine - Scattered *Eucalyptus victrix* (Coolibah) and *Corymbia* medium woodland, over open *Melaleuca acacioides* and *Acacia aneura* (Mulga) tall shrubland, over scattered low shrubs and *Cyperus* sedge, with open *Cymbopogon ambiguus* grassland;

4. Alluvial plain - Scattered medium *Acacia* over sparse low *Acacia pruinoarpa* woodland, over sparse mallee, open *Exocarpus aphyllus* shrubs and open *Triodia basedowii* hummock grassland; and

5. Scree - Scattered tall *Sida* shrubs over scattered medium shrubs of *Grevillea wickhamii*, over scattered low shrubs of *Acacia maitlandii* and *Acacia hilliana*, over moderately dense *Triodia basedowii* hummock grassland.

Based on the vegetation survey by ENV Australia (2007), the area subject to this clearing permit application consists largely of the mesa top and scree habitats. Both of these habitat types are well represented in the Pilbara bioregion, as verified by analysis of previous fauna surveys conducted at the Jiblebar site and surrounding area (Orebody 18 and Ophthalmia Ranges for example) (BHP Billiton, 2007). It is therefore unlikely that the small disturbance footprint associated with this clearing permit application (1.3 hectares) will result in a loss of significant habitat for fauna species indigenous to Western Australia.

Notwithstanding this, it must be acknowledged that the proposed clearing area is likely to provide habitat for a number of native fauna species and adverse impacts associated with clearing activity such as fauna mortality and loss of fauna habitat are likely to occur (BHP Billiton, 2007). Therefore, every effort should be made to keep disturbance to a necessary minimum. BHP Billiton (2006) will demarcate and retain mature trees which can be reasonably avoided, and cleared vegetative material will be stockpiled for use in rehabilitation. Rocks and branches will also be retained to encourage fauna to return to the area (BHP Billiton, 2007). Loss of fauna habitat will therefore be temporary.

Whilst outside the scope of this clearing permit application assessment, it must also be acknowledged that a number of other fauna management measures will be implemented by BHP Billiton (2007) during the construction and operational phases of the radio communications tower. For instance, no barbed wire will be used on any fencing erected around the radio communications tower to ensure that flying fauna such as birds and bats are not injured or killed (BHP Billiton, 2007). In addition, all conduits and pipes will be capped or taped shut if left open over night to ensure that fauna do not become trapped (BHP Billiton, 2007). Similarly, egress will be made at the end of any trenches, costeans or pits created during the construction phase to ensure that fauna can escape (BHP Billiton, 2007).

With consideration to conservation significant fauna, the Western Pebble-mound Mouse; *Pseudomys chapmani* (listed as Priority 4 on the Department of Environment and Conservation's Priority Fauna list) is likely to occur in the proposed clearing area based on habitat preferences and known distributions. The preferred habitat for the Western Pebble-mound Mouse is rocky hummock grasslands, with little to no soil (BHP Billiton, 2006). This species was recorded during Ecologia's 2004 fauna survey of the Jiblebar Mine site and surrounds (BHP Billiton, 2007). Given that the Western Pebble-mound Mouse has been recorded at numerous locations throughout the Pilbara, it is unlikely that the small area of proposed clearing will result in a loss of significant habitat at the subregional or bioregional level (Ecologia Environment Pty Ltd, 2006).

Based on habitat preferences and known distributions, a number of other conservation significant fauna may potentially occur within the proposed clearing area. These include (BHP Billiton, 2007): Australian Bustard; *Ardeotis australis*, Bilby; *Macrotis lagotis*, Northern Quoll; *Dasyurus hallucatus*, Night Parrot; *Pezoporus occidentalis*, Ghost Bat; *Macroderma gigas*, White-striped Mastiff Bat; *Tadarida australis* and Yellow Sheath-tailed Bat; *Saccolaimus flaviventris*. However, none of these species have previously been recorded from the Jiblebar Mine site or the surrounding area (Ecologia Environment Pty Ltd, 2004 cited in BHP Billiton, 2007). It is also important to reiterate that the habitat types within the proposed clearing area are well represented in the Pilbara bioregion (BHP Billiton, 2007) and it is therefore unlikely that the small amount of proposed clearing will significantly impact upon any of the above listed species.

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

Methodology BHP Billiton (2006).
BHP Billiton (2007).
Ecologia Environment Pty Ltd (2006).
ENV Australia (2007).

(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

There are no known records of Declared Rare Flora (DRF) or Priority Flora within the proposed clearing area (GIS Database). ENV Australia undertook a flora and vegetation survey of the proposed clearing area and surrounds in April 2007 and did not record any DRF or Priority Flora species (ENV Australia, 2007).

Two Priority Flora species have been found within Mining Lease ML266SA which the Jiblebar mine occupies (BHP Billiton, 2007). These species are: *Goodenia hartiana* (P2) and *Sida sp. Wittenoom* (P3) (BHP Billiton, 2007).

Goodenia hartiana is a multistemmed perennial herb or shrub, typically found growing in sand in dune swales and on sand hills (Western Australian Herbarium, 2007). The proposed clearing area does not support sand dunes or sand hills (ENV Australia, 2007), and it is therefore unlikely that the area under application represents

significant habitat for *Goodenia hartiana*.

Western Australian Herbarium (2007) records indicate that *Sida sp. Wittenoom* has previously been recorded from a variety of landform and soil types, including floodplains, gentle to moderate slopes and low rises on plateaus (typically on gravelly surfaces, red-brown loams). Based on the above, *Sida sp. Wittenoom* could potentially occur within the proposed clearing area, however it was not recorded during a flora survey of the application area and its surrounds (ENV Australia, 2007).

The vegetation associations within the proposed clearing area can be considered common on a regional basis (BHP Billiton, 2007). This has been verified by comparing those vegetation associations identified within the radio communication survey by ENV Australia (2007) with a much larger survey of the Jimblebar mine site and surrounding area (covering approximately 2000 hectares) in 2004 (BHP Billiton, 2007). It is therefore unlikely that the proposed clearing area provides unique or restricted habitat for Rare or Priority Flora.

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

Methodology BHP Billiton (2007).
 ENV Australia (2007).
 Western Australian Herbarium (2007).
 GIS Database:
 - Declared Rare and Priority Flora List - CALM 01/07/05.

(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 (TECs) within, or in close proximity to, the proposed clearing area (GIS Database). The nearest known TEC is the Ethel Gorge aquifer stygobiont community, located approximately 30 kilometres west north-west of the proposed clearing area (GIS Database).

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

Methodology GIS Database:
 - Threatened Ecological Communities - CALM 12/04/05.

(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 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database). There is approximately 100% of the pre-European vegetation remaining of Beard Vegetation Association 82 in the Pilbara bioregion (Shepherd et al, 2001). Approximately 10.2% of Beard Vegetation Association 82 is represented in conservation reserves within the Pilbara bioregion, and 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 Association 82 below current recognised threshold levels, below which species loss increases significantly.

	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					
82	2,565,930	2,565,930	100	least concern	10.2
Beard veg assoc. – Bioregion					
82	2,563,610	2,563,610	100	least concern	10.2

* 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 - EA 18/10/00.
- Pre-European Vegetation - DA 01/01.

(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

There are no perennial watercourses or wetlands within the proposed clearing area (ENV Australia, 2007; GIS Database). However, an ephemeral drainage line (a tributary of the Copper Creek) is present on the eastern side of the proposed clearing area (ENV Australia, 2007).

ENV Australia (2007) described the vegetation of the ephemeral drainage line as:

'Eucalyptus leucophloia ssp. leucophloia - mixed Acacia spp. over Triodia basedowii - Cymbopogon obtectus woodland on small drainage'.

Despite the presence of two weed species within this vegetation community (Buffel Grass and Birdwood Grass) and some minimal cattle trampling, ENV Australia (2007) described the vegetation condition of the drainage line as 'very good'. This small drainage community is not well represented in the region due to the limited occurrence of major drainage lines and their tributaries in comparison to other habitats in the Pilbara (ENV Australia, 2007). The vegetation community associated with the drainage line can be classified as riparian (ENV Australia, 2007), and such vegetation often supports higher levels of biodiversity and available resources than the surrounding landscape, particularly in dryland environments such as the Pilbara (Sparks, 1995; Tubman & Price, 1999; Lynch & Catterall, 1999 cited in ENV Australia, 2007). It is recommended that disturbance to riparian vegetation be avoided wherever possible (ENV Australia, 2007).

Based on the above, the proposed clearing is at variance to this Principle. However, BHP Billiton (2007) has advised that no clearing will be undertaken within the drainage line located on the eastern side of the application area. Should the permit be granted, it is recommended that a condition be imposed on the permit to ensure no clearing is undertaken within the drainage line or its fringing vegetation to preserve what may be an area of higher biological diversity value.

Methodology BHP Billiton (2007).
ENV Australia (2007).
GIS Database:
- Hydrography, linear - DOE 01/02/04.

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

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

The proposed clearing area is within the McKay land system (GIS Database) as mapped by the Department of Agriculture Western Australia (2004). The McKay land system is characterised by hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands (Department of Agriculture Western Australia, 2004). The hard spinifex vegetation which is characteristic of the land system is not preferred by livestock, and the system is not prone to degradation or soil erosion (Department of Agriculture Western Australia, 2004).

At a finer scale, the proposed clearing area is situated on a rocky hill, sloping to the north towards a floodplain area associated with the Copper Creek (BHP Billiton, 2007). Rocky outcrops are present within the proposed footprint area for the construction of the radio communications tower, and soils are generally sandy lateritic gravels within the remainder of the clearing permit application boundary (BHP Billiton, 2007).

Given the rocky nature of the proposed clearing area there is likely to be a minimal risk of soil erosion following clearing activities. BHP Billiton (2007) have carefully selected the site for the proposed radio communications tower to ensure that extensive cut and fill earthworks are not required, thereby reducing the amount of soil to be removed from the site. Topsoil and vegetation will be retained during the initial site clearing activities and will be used in rehabilitation (BHP Billiton, 2007). The vehicle parking area which is required during the initial construction phase of the project will be rehabilitated once construction is complete (BHP Billiton, 2007). At the mine closure stage, all infrastructure associated with the radio communications tower will be removed and the site will be rehabilitated using stockpiled topsoil and vegetation (BHP Billiton, 2007).

Two introduced flora species were recorded within the proposed clearing area by ENV Australia (2007). These were: *Cenchrus setiger* (Birdwood grass) and *Cenchrus ciliaris* (Buffel grass). These weeds were found in relatively small numbers in the east of the application area along an ephemeral drainage line (ENV Australia, 2007). Care must be taken to ensure that the proposed clearing activities do not spread or introduce the above listed weed species to non infested areas. The proponent will implement the following management measures to minimise the introduction and spread of weeds and control weed species on site (BHP Billiton, 2007):

- all machinery and light vehicles will be thoroughly cleaned prior to arrival on site to remove all dirt, stones or vegetative material that may be transferred;
- the workforce will be educated on the importance of weed hygiene and how to identify common weeds of the area;
- topsoil that is highly infested with weeds will be separated from weed free topsoil and vegetation and will not be used in rehabilitation;
- regular monitoring of the proposed clearing area will be undertaken to inspect for new weed outbreaks; and
- controlled spraying and hand removal will be undertaken in and around drainage areas with high levels of weed infestation.

Should the permit be granted, it is recommended that a condition be imposed on the permit to enforce weed management commitments made by the proponent.

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

Methodology BHP Billiton (2007).
Department of Agriculture Western Australia (2004).
ENV Australia (2007).
GIS Database:
- Rangeland Land System Mapping - DA.

(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 area (GIS Database). The nearest conservation reserve is the Collier Range National Park, located approximately 130 kilometres south west of the proposed clearing 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 - CALM 01/07/05.

(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 site of the proposed radio communications tower consists of rocky outcrops and a rocky hill which slopes northwards towards a floodplain area associated with the ephemeral Copper Creek (BHP Billiton, 2007). This creek system flows for approximately 10 kilometres in a north - easterly direction where it joins the Jimblebar Creek; a major tributary of the Fortescue River (BHP Billiton, 2007). The proposed clearing will not involve any disturbance to ephemeral drainage within the application area boundary, nor will the floodplain of the Copper Creek be disturbed (BHP Billiton, 2007). Given the rocky nature of the proposed radio communications tower site, it is unlikely that the proposed vegetation removal will significantly increase natural soil movement downslope towards the Copper Creek.

From the existing access track which traverses the eastern portion of the application area, BHP Billiton will construct a track of approximately six metres width running east - west to access the radio communications tower site (BHP Billiton, 2007). This track will initially be used by construction traffic and later for ongoing maintenance (BHP Billiton, 2007). To ensure that the proposed access track does not impede natural surface water flow, a small culvert will be placed beneath the track to allow surface water to follow the natural drainage pattern towards the Copper Creek (BHP Billiton, 2007).

The area under application is not within a Public Drinking Water Source Area (PDWSA) (GIS Database). It is unlikely that the removal of 1.3 hectares of native vegetation will have any significant impact upon groundwater levels and/or quality.

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

Methodology BHP Billiton (2007).
GIS Database:
- Public Drinking Water Source Areas (PDWSAs) - DOE 28/04/05.

(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

There are no perennial watercourses or wetlands within the proposed clearing area (GIS Database). The Copper Creek is located 200 - 300 metres north of the proposed clearing area and flows in a west to east direction (BHP Billiton, 2007). An ephemeral tributary of the Copper Creek runs through the eastern side of the proposed clearing area, however no clearing will occur within the vicinity of this tributary (BHP Billiton, 2007).

The Copper Creek experiences natural flood events during the wet season (November to March) following significant rainfall events. Floodwaters feed into the nearby Jimblebar Creek (BHP Billiton, 2007). The small area of proposed clearing (1.3 hectares) 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 BHP Billiton (2007).

GIS Database:
- Hydrography, linear - DOE 01/02/04.

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

Comments

The clearing permit application was advertised by DoIR, inviting submissions from the public. One public submission was received, raising concerns regarding the potential impacts of the proposed vegetation clearing on Native Title rights, Sites of Aboriginal Significance and land degradation.

There is one native title claim over the area under application (GIS Database). This claim (WC05/006) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). However, the mining 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 no registered Sites of Aboriginal Significance within the area applied to clear (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.

Aboriginal Sites of Significance are protected under the *Aboriginal Heritage Act 1972*. The proponent is committed to the management and protection of Aboriginal heritage sites (BHP Billiton, 2005). BHP Billiton has a heritage protocol agreement with the Nyiyaparli people (traditional owners of the proposed clearing area), and regularly consult with the Nyiyaparli people to undertake Aboriginal heritage surveys in and around Newman (BHP Billiton, 2005). BHP Billiton also has an internal process; the Project Environment and Aboriginal Heritage Review (PEAHR), which is designed to prevent inadvertent disturbance of Aboriginal heritage sites within BHP Billiton operations. Prior to the commencement of any land disturbance activity, a PEAHR must be completed and submitted to BHP Billiton's Aboriginal Affairs Department, for assessment. All land disturbance activities must be approved by BHP Billiton's Environment and Aboriginal Heritage staff (BHP Billiton, 2005).

The potential impacts of the proposed clearing on land degradation are addressed under Clearing Principle (g).

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 BHP Billiton (2005).

GIS Databases:
- Aboriginal Sites of Significance - DIA 04/07/02.
- Native Title Claims - DLI 19/12/04.

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Production	Mechanical Removal	1.3	The Clearing Principles have been addressed and the proposed clearing is at variance to Principle (f), may be at variance to Principle (a), is not likely to be at variance to Principle (b), (c), (d), (g), (h), (i) or (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 weed management, preservation of riparian vegetation, rehabilitation and permit reporting.

5. References

- BHP Billiton (2005) Aboriginal Heritage Induction Handbook. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- BHP Billiton (2006) Jimblebar - Wheelarra Hill Mine Significant Species Management Plan. Revision 2, June 2006.
- BHP Billiton (2007) Rapid Growth Projects: Jimblebar Mine - Radio Communications Tower. Clearing (Purpose) Permit Application Supporting Document. September 2007.
- CALM (2001) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 2(PIL 2 - Fortescue Plains subregion).
- Department of Agriculture Western Australia (2004) Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia. South Perth, 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.
- Ecologia Environment Pty Ltd (2006) Jirridi Terrestrial Vertebrate Fauna Survey. Unpublished report for BHP Billiton Iron Ore Pty Ltd. Perth, Western Australia.
- ENV Australia (2007) Jimblebar Stage 2 - Levee Banks & Communications Tower Redevelopment - Flora and Vegetation Assessments. Unpublished report prepared for BHP Billiton Iron Ore, June 2007.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia (updated 2005).
- Western Australian Herbarium (2007) Florabase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au/>

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.