Government of **Western Australia**
Department of **Mines and Petroleum**

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2593/1
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: *Iron Ore (Mount Newman) Agreement Act 1964, Mineral Lease 244SA (AML 70/244)*
Local Government Area: Shire Of East Pilbara
Colloquial name: Jimblebar Access Road Upgrade

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
15		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

Beard vegetation associations have been mapped at 1:250,000 scale for the whole of Western Australia, and are a useful tool to examine the vegetation extent in a regional context. Two Beard vegetation associations are located within the area proposed to be cleared (GIS Database). These vegetation associations are (Shepherd et al, 2001):

Beard vegetation association 18 - Low woodland; mulga (*Acacia aneura*); and

Beard vegetation association 82 - Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana.*

A flora and vegetation survey of the application area was completed by ENV Australia between 20-23 November 2007. As a result, there were 10 vegetation associations identified within the application area (ENV Australia, 2008):

Low Slopes 1: *Corymbia derticola* ssp. *Deserticola* and *Eucalyptus gamophylla / Acacia aneura* var. *conifera / Triodia* sp. *Shovelanna Hill*.

Drainage 1: *Eucalyptus gamophylla* / *Acacia ancistrocarpa / A. adsurgens* and A. *kempeana / Triodia basedowii* and *Aristida holathera* var. *holathera*

Drainage 2: *Eucalyptus gamophylla* and *Eucalyptus leucophloia* ssp. *Leucophloia*/ / *Acacia melleodora / Themeda triandra* and *Cymbopogon obtectus*.

Drainage 3: *Corymbia hamersleyana*/ / *Acacia monticola* and *Acacia ancistrocarpa / Triodia pungens* and *Themeda triandra*.

Small Hills 1: *Eucalyptus leucophloia ssp. Leucophloia* and *Corymbia deserticola ssp. Deserticola*/ / *Acacia adsurgens*/*Amphipogon serice us*.

Small Hills 2: *Corymbia hamersleyana* / *Hakea chordophylla / Triodia sp. Shovelanna Hill*.

Sandplains 1: Mixed *Acacia spp.* / *Triodia sp. Shovelanna Hill*.

Sandplains 2: *Acacia bivenosa* and *Acacia phachyacra* / *Triodia pungens* and *Triodia* sp. *Shovelanna Hill*.

Sandplains 3: *Codonocarpus cotinifolius* / *Acacia aneura* var. *conifera* and *Acacia pruinocarpa* / *Aristida contorta* and mixed tussock grasses.

Sandplains 4: *Corymbia hamersleyana* / *Acacia citrinoviridis* and *Petalostylis labicheoides* / *Triodia basedowii* and *Cenchrus cilliaris*.

Clearing Description

BHP Billiton Iron Ore Pty Ltd (here after referred to as BHP Billiton) have applied to clear 15 hectares of vegetation within a purpose permit boundary of 455 hectares. The purpose of the clearing is for the upgrade and sealing (bituminizing) of the Jimblebar access road (which leads to Ore Body 18), upgrading of a disused side track and the development of seven borrow pits (BHP Billiton, 2008).

	The application area is approximately 15 kilometres east of the town of Newman (ENV Australia, 2008).
Vegetation Condition	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994) To Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994)
Comment	The majority of vegetation within the application area is in 'excellent' to 'very good' condition (ENV Australia, 2008a). However, there are some areas in a 'poor' or 'completely disturbed' condition which are associated with the rail crossing, rail lines, power line, rail access road and northern access road (ENV Australia, 2008).

3. Assessment of application against clearing principles

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

Comments

Proposal is not likely to be at variance to this Principle

The application area is located within the Fortescue sub-region of the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). The subregion is described as having extensive salt marshes, mulga-bunch grass, and short grass communities on alluvial plains in the east (Kendrick, 2001). In addition river gum woodlands fringe the drainage lines and in the northern limit of the subregion there a numerous mulga stands. The main land uses of the subregion are grazing of native pastures, Unallocated Crown Land and Crown reserves, Conservation and Aboriginal leases (Kendrick, 2001).

A flora and vegetation assessment was undertaken by ENV Australia (2008) between 20-23 November 2007. The results showed that there was a total of 112 flora taxa collected in the application area, including 28 families, with the most represented being Mimosaceae (26 taxa recorded) and Poaceae (17 taxa recorded). ENV Australia (2008) have stated that the flora species richness was of a moderate level and was similar that of previous studies undertaken in the local area. There were no Declared Rare Flora (DRF) or Priority flora species recorded within the application area (ENV Australia, 2008).

A fauna habitat assessment of the application area was undertaken by Pilbara Flora (2008) on the 20 October 2008. Pilbara Flora (2008) have noted that the habitats present within the application area are typical of the Pilbara region. During the fauna habitat assessment two active pebble-mounds were recorded within the application area. This indicates that the Western Pebble-mound Mouse (*Pseudomys chapmanii*) inhabits the application area. However, BHP Billiton (2008) have committed to avoid the two locations where active pebble-mounds were recorded, and undertake pre-clearance surveys to ensure no pebble-mounds will be disturbed during the clearing process. Based on this, should the permit be granted, it is recommended that conditions be placed on the permit for the purposes of fauna management.

Three weed species were identified within the application area during the flora and vegetation survey (ENV Australia, 2008): *Aerva javanica* (Kapok Bush), *Cenchrus ciliaris* (Buffel Grass) and *Citrullus lanatus* (Pie Melon). The presence of weeds is likely to reduce the biological diversity of the proposed clearing area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Should a clearing permit be granted, it is recommended that a condition be imposed on the permit for the purpose of weed management.

The application area falls within the Ethel Creek Pastoral Lease (GIS Database) and substantial disturbance from grazing was evident during the flora and vegetation assessment (ENV Australia, 2008). Other disturbances within the application area include car tracks, fire, rubbish, weeds, cattle trampling and grazing, road dust, soil disturbance (soil heaping, ripping) and previous clearing (ENV Australia, 2008). Given the level of pre-existing disturbance and the fact the vegetation types of the application area are well represented in the Pilbara (ENV Australia, 2008), it is unlikely the vegetation of the application area is of a higher biodiversity value than that of surrounding areas.

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

Methodology

BHP Billiton (2008).
ENV Australia (2008).
Kendrick (2001).
Pilbara Flora (2008).
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions)
- Pastoral Leases
- Pre-European Vegetation

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal is not likely to be at variance to this Principle

Pilbara Flora (2008) conducted a fauna habitat assessment of the application area on the 20 October 2008. The fauna habitat assessment included a detailed desktop study and a reconnaissance survey of the application area.

During the reconnaissance survey, Pilbara Flora (2008) traversed the entire application area on foot and recorded the following:

- All fauna observed;
- Tracks, paths, scats, burrows, nests and any other signs of fauna;
- Specialised habitat types utilised by conservation significant fauna;
- Watering points;
- Potential roosting and nesting sites;
- Habitat types and condition; and
- North-east-south-west panoramic photos taken at regular intervals along the foot traverses. Each photo point was GPS referenced.

The results of the reconnaissance survey showed that there were four habitat types recorded in the application area, including; Hills, Slopes, Drainage Lines and Plains. These habitat types correspond with the vegetation types mapped by ENV Australia (2008). Pilbara Flora (2008) have noted that there were no habitat types noted within the application area that contained features considered as specialised habitat suitable for conservation significant fauna. Typical habitat features considered suitable for conservation significant fauna include gorges, sheltered valleys, pisolitic mesas, caves, mine shafts, closed forests, large trees with nesting hollows and waterholes (Pilbara Flora, 2008).

The desktop study comprised a literature review of a fauna survey undertaken by ENV Australia in 2006 at the Ore body 18 project area (which lies 10 kilometres to the east of the application area) and a detailed database search. As a result of the desktop study, Pilbara Flora (2008) estimate that up to 243 fauna taxa including 39 mammals, 93 herptiles and 111 avifauna may be found in the application area.

Of the 243 fauna taxa, seven of these are conservation significant fauna species and were assessed as having the potential of occur within the application area (Pilbara Flora, 2008). These include: Western Pebble-mound Mouse (*Pseudomys chapmanii*), Blind Snake *(Ramphotyphlops ganei*), Australian Bustard (*Ardeotis australis),* Bush Stone-curlew (*Burhinus grallarius*), Peregrine Falcon (*Falco peregrinus*), Grey Falcon (*Falco hypoleucos*) and Rainbow Bee-eater (*Merops ornatus*).

The Western Pebble-Mound Mouse is endemic to the Pilbara region of Western Australia, and its habitat is noted as gentle colluvial slopes with pebbles in a size range suitable for the transport for construction of pebble-mounds (Pilbara Flora, 2008). During the fauna survey, four pebble-mounds were discovered in the application area, two of which were active (Pilbara Flora, 2008). Given the presence of active pebble mounds it is highly likely that this species inhabits the application area.

In regards to the management of this species, BHP Billiton (2008) have committed to avoid clearing in the locations where the two active pebble-mounds were recorded. Further to this, BHP Billiton (2008) have also committed to undertake a targeted search for pebble-mounds along the disused vehicle track which is to be upgraded into a bituminised road. Any active pebble-mounds discovered during this search will be flagged and avoided. Based on this, should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of fauna management.

The Grey Falcon (Department of Environment and Conservation (DEC) – Priority Four) is a medium-sized falcon which is sparsely distributed in the northern half of Western Australia, restricted to shrublands, grasslands and wooded watercourses and is occasionally found in open woodlands near the coast and occurs near wetlands where surface water attracts prey (Pilbara Flora, 2008). The Grey Falcon nests in large eucalypts associated with wetlands or watercourses (Pilbara Flora, 2008). There were no large eucalypt trees supporting hollows found in the application area (Pilbara Flora), therefore, it is unlikely the application area supports suitable nesting habitat for the Grey Falcon.

The Rainbow Bee-eater (Migratory and Marine species – *Enivronmental Protection and Biodiveristy Conservation Act 1999*) is a medium sized bird, and the only species of bee-eater in Australia (Department of Environment and Water Resources (DEWR), 2008). The Rainbow Bee-eater is distributed across much of mainland Australia and on several near shore islands. It occurs in a range of habitats including open forests and woodlands, shrubland areas, grasslands, inland and coastal sand dune systems, mangroves and cleared or semi-cleared habitats (DEWR, 2008). It is possible that the Rainbow Bee-eater may forage for food within the application area, however, given that there are large areas of uncleared vegetation surrounding the project it is unlikely that the Rainbow Bee-eater relies on the application area for habitat (Pilbara Flora, 2008). Based on this, it is unlikley the application area is representative of significant habitat for this speicies.

The Peregrine Falcon (Schedule 4, other specially protected fauna, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2008*) is widespread across Australia including some continental islands but absent from most deserts and the Nullarbor Plain (Johnstone & Storr, 1998). Its habitat consists of areas such as cliffs along

coasts, rivers and ranges, and about wooded watercourses and lakes (Johnstone & Storr, 1998). There were no habitat features identified during the fauna survey which would indicate that suitable nesting sites for the Peregrine Falcon occur in the application area (Pilbara Flora, 2008). As a result, it is unlikely that the application area is representative of significant habitat for this species.

The Blind Snake *(Ramphotyphlops ganei*) (DEC - Priority One) was recorded in the 2006 ENV Australia survey of the Ore body 18 project area in the rocky hilltop habitat (Pilbara Flora, 2008). However, this habitat was not recorded in the application area, and therefore this species is not likely to be present within the application area.

The Australian Bustard (DEC - Priority Four) is limited to the arid areas of Northern and Central Australia (Caughley et al., 1986). It is found in tussock grasslands, Triodia hummock grassland, grassy woodland and low shrublands (Garnett & Crowley, 2000). Given that there are tussock and Triodia hummock grasslands, and low shrublands present within the application area it is possible that the Australian Bustard may frequent the application area. However, it is unlikely that this species would be reliant on the application area for habitat, as the habitat types present are well represented in the Pilbara region (Pilbara Flora, 2008).

The Bush Stone-curlew (DEC – Priority Four) is large bird approximately 50-60 centimetres high which inhabits grassy woodlands (Pilbara Flora, 2008). Pilbara Flora (2008) have stated that this species could occur in some of the denser shrubland areas of the application area. However, the continual presence of vehicles and trains, and the lack of permanent water could act as a deterrent for this species (Pilbara Flora, 2008). Based on this, and that fact the vegetation types of the application area are well represented in surrounding areas (Pilbara Flora, 2008), it is unlikely that the overall habitat of this species will be significantly reduced from the proposed clearing.

It is acknowledged that as part of the proposed clearing there will be a loss of habitat and fauna displacement is likley to occur. However, it should be noted that although the vegetation condition across much of the application area is 'very good' to 'excellent' much of the vegetation proposed to be cleared is associated with an existing access track and is in a 'degraded' state, resulting in a reduced habitat value. Furthermore, the habitat types present within the application area are well represented in the Pilbara region (Pilbara Flora, 2008) and thus the removal of 15 hectares of vegetation is unlikely to have a severe impact on the habitat values of the local area.

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

Methodology

BHP Billiton (2008).
Caughley et al. (1986).
DEWR (2008).
ENV Australia (2008).
Garnett & Crowley (2000).
Johnstone & Storr (1998).
Pilbara Flora (2008).

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

Comments

Proposal may be at variance to this Principle

There are no known records of Declared Rare Flora (DRF) or Priority flora species within the proposed clearing area (GIS Database).

A flora and vegetation assessment of the application area was completed between 20-23 November 2007 by ENV Australia (2008). The objectives of the survey were to document the flora and vegetation of the application area and to determine whether any species or ecological communities of conservation significance occur in the application area.

Using information gained from previous surveys conducted in the area and a Department of Environment and Conservation (DEC) database search, it was considered that one DRF and 24 Priority flora species could potentially occur within the application area (ENV Australia, 2008). However, during the reconnaissance survey there were no DRF or Priority flora species recorded within the application area (ENV Australia, 2008).

It should be noted that the flora and vegetation assessment was undertaken during a dry season with only four millimetres of rainfall received in the previous three months (ENV Australia, 2008). Consequently, it is possible that a number of ephemeral and annual species were missed (ENV Australia, 2008). ENV Australia (2008) have noted that a number of Priority flora which have been previously found close to the application area are considered particularly likely to occur within the application area. These include: *Triumfetta leptacantha*, *Eremophila magnifica* ssp. *Magnifica*, *E. magnifica* ssp. *Velutina* and *E.* ssp. Ophthalmia Range (ENV Australia, 2008).

Eremophila magnifica ssp. *Magnifica* (DEC - Priority Four) is a shrub approximately 0.5–1.5 metres high, usually found in habitats with skeletal soils over ironstone and rocky screes (Western Australian Herbarium, 2008). According to the Western Australian Herbarium (2008) this species has been recorded in upland areas such as on the summits of hills, steep slopes, rocky screes, summits of knolls, breakaways and stony ridges.

Of the habitats found in the application area, only the low hills habitat may be suitable for this species. However, it is far more likely that the optimal habitat for this species is located in a series of ridges which are located approximately 500 metres to the north of the application area (GIS Database). Based on this, it is unlikely the application area is representative of significant habitat for this species.

E. magnifica ssp. *Velutina* (DEC – Priority Three) is a shrub approximately 0.5-1.5 metres high found in areas with skeletal soils over ironstone. According to the Western Australian Herbarium (2008) this species has been recorded in higher areas in the landscape such as steep slopes, cliffs and rocky outcrops. There is a small chance that this species may inhabit the small hills habitat type of the application area. However, optimal habitat for this species is far more likely to be found in the series of ranges found 500 metres to the north of the application area (GIS Database). Based on this, it is unlikely the application area is representative of significant habitat for this species.

Triumfetta leptacantha (DEC - Priority Three) is a small spreading shrub approximately 0.25 – 0.6 metres high commonly found on stony red loams and amongst boulders and stony hillsides (Western Australian Herbarium, 2008). According to the Western Australian Herbarium (2008) this species has been recorded in a number of habitats including gullies, slopes, on the edges of gorges, rocky breakaways, cliff faces and drainage lines. Given the above, suitable habitat (in the form of low hills and drainage lines) for this species may occur within the application area. However, the habitats of the application area are well represented in the local area (ENV Australia, 2008). Based on this, it is unlikely the overall habitat of this species will be significantly impacted from the proposed clearing.

Eremophila. ssp. Ophthalmia Range (DEC - Priority One) is a small shrub which is known from only two recordings where it was found in red orange ferritic sandy loams on a plain-river outwash and red rocky soils of a hillside or rangeland (Western Australian Herbarium, 2008). Given that this species has been recorded close by in the Ophthalmia Ranges it is possible that the low hills area may be suitable habitat for this species. However, it should be noted that the area proposed to be cleared is small (15 hectares) and much of it has been degraded. Furthermore, ENV Australia (2008) have stated that the habitats in the application area are well represented in the local area. Based on this, it is unlikely the overall habitat of this species will be signifcantly impacted by the proposed clearing.

Based on the above, the proposed clearing may be at variance to this Principle. However, the habitats present within the application area are well represented in the local area (ENV Australia, 2008), and optimal habitat for the four Priority flora species mentioned above is likely to be found outside the application area and more likely in the Opthalmia Ranges.

Methodology ENV Australia (2008).
Western Australian Herbarium (2008).
GIS Database:
- Declared Rare and Priority Flora List
- Topographic Contours, Statewide

(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) found within the application area (GIS Database).

The nearest known TEC to the application area is Ethel Gorge which is located approximately 5.5 kilometres to the west of the application area. There were no TECs identified during the flora and vegetation assessment of the application area (ENV Australia, 2008). Given the distance between the proposed clearing and Ethel Gorge it is unlikely that the conservation values of this TEC would be compromised from the proposed clearing.

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

Methodology ENV Australia (2008).
GIS Database:
- Threatened Ecological Communities - CALM

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments **Proposal is not at variance to this Principle**
The application area is located within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Shepherd et al. (2001) reports that approximately 100% of the pre-European vegetation remains within the Pilbara Bioregion. The vegetation within the majority of the application area is broadly mapped as Beard Vegetation Association 18: Low woodland; mulga (*Acacia aneura*); with a small area at central-southern edge of the application area mapped as Beard Vegetation Association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database). According to Shepherd et al., (2001) there is approximately 100% of each of these vegetation types remaining at both a State and bioregional level.

Although several large scale mining operations are located within a 50 kilometre radius of the application area (GIS Database), on a broader scale the Pilbara region has not been extensively cleared. Hence the area applied to clear is not considered to represent a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,164	~99.9	Least Concern	6.3
Beard vegetation associations – State					
18	19,892,437	19,890,348	~100	Least Concern	2.1
82	2,565,930	2,565,930	~100	Least Concern	10.2
Beard vegetation associations – Pilbara Bioregion					
18	676,561	676,561	~100	Least Concern	16.8
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) updated 2005.
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- Pre-European Vegetation

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

Comments **Proposal is at variance to this Principle**
There are several minor non-perennial watercourses which intersect the application area (GIS Database). These watercourses flow from the ridges in the north of the application area and disperse onto the plains to the south (GIS Database).

It is acknowledged that some clearing will be required within the watercourses found within the application area. However, it should be noted that the amount of clearing required within the watercourses is negligible, and given the close proximity of the watercourse vegetation to the access road, impacts to vegetation condition are evident. Therefore, it is unlikely that the environmental values of the vegetation associated with these watercourses will be significantly reduced by the proposed clearing.

It is the proponent's responsibility to liaise with the Department of Water to determine whether a Bed and Banks permit is required for the proposed works.

Based on the above, the proposed clearing is at variance to this Principle. However, the amount of vegetation required to be cleared within these watercourses is small, most of which is in a degraded state.

Methodology GIS Database:
- Hydrography, Linear - DOE 01/02/04.
- Geodata, Lakes
- Rivers 250K - GA.

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

Comments **Proposal is not likely to be at variance to this Principle**
The application area falls predominantly within the Boolgeeda land system, with small areas on the southern border located within the Newman land system (GIS Database).

The Boolgeeda land system consists of stony lower slopes and plains below hill systems, supporting hard and

soft spinifex grasslands and mulga shrublands. The application area includes both stony slopes and upper plains, and stony lower plains; both of which have suface mantles of abundant ironstone, chert and quartz (Van Vreeswyk et al., 2004). This land system is generally not susceptible to erosion which is likely to be due to the presence of a stony mantle (Van Vreeswyk et al., 2004).

The Newman Land System consists of jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. The landform in which the application area lies is named stony plains – gently undulating lower plains and interfluves up to 500 metres in extent with mantles of abundant to very abundant pebbles of ironstone. This land system is not prone to erosion due to the stony mantle which provides protection from erosional forces (Van Vreeswyk et al., 2004).

In regards to the potential for soil erosion, it shold be noted that the proposed clearing is for the upgrade and bituminizing of an access road. This will be a permanent structure, which may be subject to some minor erosion in its initial construction phase, however, once constructed it will not be subject to erosion. Vegetation clearing is also required in some areas lying adjacent to the access road for borrow pits. BHP Billiton (2008) have stated that these areas will be progressively rehabiliated as soon as land becomes available.

It should be noted that there are several minor, non-perennial watercourses which intersect the application area (GIS Database). BHP Billiton (2008) have stated that existing culverts are already in place in areas where the access road intersects watercourses. These culverts ensure surface water flows are maintained and downstream vegetation is not starved of surface water flow.

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

Methodology BHP Billiton (2008).
Van Vreeswyk et al., (2004).
GIS Database:
- Rangeland Land System Mapping – DA
- Topographic Contours, Statewide

(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 at variance to this Principle**
There are no conservation areas in the vicinity of the application area (GIS Database). The nearest DEC conservation area is the Collier National Park which is located approximately 125 kilometres south/south-west of the application area; and the Karijini National Park, approximately 135 kilometres west/north-west of the application area (GIS Database). Given the distance between the application area and the nearest conservation area, it is unlikely that the environmental values of either of the conservation areas mentioned would be compromised by the proposed clearing.

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

Methodology GIS Database:
- CALM Managed Lands and Waters – CALM

(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 average annual evaporation rate of the application area is approximately 3,200 millimetres (GIS Database). Given the low average annual rainfall (approximately 310 millimetres) and high average annual evaporation rate, recharge to the groundwater table is expected to be low (GIS Database). As a result, it is unlikely that the removal of 15 hectares of native vegetation will significantly impact on groundwater levels or quality within the application area.

The application area is located within the Newman Water Reserve, a Public Drinking Water Source Area (PDWSA) (GIS Database). All activities conducted within the PDWSA, should be in accordance with the Department of Water (DoW) Land Use Compatibility Tables (DoW, 2008). The proponent is advised to follow the DoW's Water Quality Protection Guidelines for the mining industry, to minimise any risk that the proposed clearing and associated activities may pose to the Newman Water Reserve (DoW, 2008). The DoW is satisfied that the proposed clearing of 15 hectares is unlikely to have a significant impact on the quality or quantity of groundwater (DoW, 2008).

There are several non-perennial watercourses which intersect the application area (GIS Database). These watercourses flow from the ridges of the north of the application area and disperse on the plains to the south (GIS Database). These drainage lines are dry for most of the year, only flowing briefly immediately following significant rainfall. Given the average annual rainfall (approximately 310 millimetres) and average annual evaporation rate (3,200 millimetres), there is little surface water flow during normal seasonal rains. It is therefore unlikely that the proposed clearing will impact upon surface water quality either onsite or offsite.

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

Methodology BoM (2008).
DoW (2008).
GIS Database:
- Evapotranspiration, Point Potential
- Hydrography, linear
- Potential Groundwater Dependant Ecosystems
- 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 application area is located on plain which sits below a series of ridges (GIS Database). It is likely that during rainfall periods water in the application area would move via sheet flows towards drainage lines then downstream to the south and west eventually dispersing into the Fortescue River (GIS Database).

The project area is located within the Pilbara region of Western Australia (GIS Database). This region is subject to an arid tropical climate with two distinct seasons, a hot summer (October – April) and a mild winter (May – September) (BoM, 2008). The nearby Newman town site has an average annual rainfall of 310.2 mm per year (BoM, 2008). Intense rainfall events generally associated with cyclonic activity during the summer months are known to occur in the area, and these often result in localised flooding (BoM, 2008).

The annual evaporation rate of the Newman region is approximately 3,200 millimetres (GIS Database). This is more than ten times the average amount of annual rainfall received by Newman (310.2 millimetres) (BoM, 2008). Based on this, it is likely that any water that collects and pools during heavy rainfall periods will evaporate quickly.

The application area is located within the Fortescue River Upper Catchment which is approximately 2,975,192 hectares in size (GIS Database). Given the small scale of the proposed clearing (15 hectares) in relation to the size of the Fortescue River Upper Catchment, it is unlikely the proposed cearing will significantly increase the incidence or intensity of flooding within the application area.

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

Methodology BoM (2008).
GIS Database:
- Evapotranspiration, Point Potential
- Hydrographic Catchments - Catchments.
- Topographic Contours, Statewide

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 (WC99/004) 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 no registered Sites of Aboriginal Significance within the application areas (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.

BHP Billiton has developed a Project Environmental and Aboriginal Heritage Review (PEAHR) procedure to manage the implementation of its environmental, Aboriginal heritage, land tenure and legal commitments prior to and during land clearing (BHP Billiton, 2005). Additionally, the PEAHR procedure provides a mechanism whereby technical and professional advice provided regarding environmental issues, land access and Aboriginal heritage planning and management issues is sought where necessary. The PEAHR is designed to prevent unintentional disturbance of cultural material within BHPBIO operations (BHP Billiton, 2005).

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. BHP Billiton's Environment and Aboriginal Heritage staff must approve all land disturbance activities (BHP Billiton, 2008).

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).

BHP Billiton (2008).
GIS Database:
- Native Title Claims
- Sites of Aboriginal Significance DIA

4. Assessor's comments

Comment

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

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of mitigating the potential for land degradation, flora management, weed management and permit reporting.

5. References

BHP Billiton (2005) Aboriginal Heritage Induction Handbook. BHP Billiton Iron Ore Pty Ltd, Western Australia.

BHP Billiton (2008) Jimblebar Access Road Upgrade Purpose Permit Vegetation Clearing Permit Application. Supporting Documentation. June 2008.

BoM (2008) Climate of Port Hedland. URL: http://www.bom.gov.au/weather/wa/port_hedland/climate.shtml

Caughley G, Grice D, and Short J (1986) Density and Distribution of the Australian Bustard Ardeotis australis. Biological Conservation 35: 259-267.

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.

DEWR (2008) Merops ornatus - Rainbow Bee-eater. URL: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pltaxon_id=670 Department of Environment and Water Resources

DoW (2008) Water Allocation Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Received 23 October 2007. Department of Water, Western Australia.

ENV Australia (2008) Jimblebar Access Road Flora and Vegetation Assessment. Unpublished report, prepared for BHP Billiton Iron Ore Pty Ltd, 27 March 2008.

Garnett, S.T., & Crowley, G.M. (2000) The Action Plan for Australian Birds. Department of the Environment and Water Resources, URL: http://www.environment.gov.au/biodiversity/threatened/publications/action/birds2000/pubs/australian-bustard.pdf

Johnstone, R.E, & Storr, G.M. (1998) Handbook of Western Australian Birds. Western Australian Museum. Perth.

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 (2001) Pilbara 2 (PIL2 - Fortescue Plains Subregion) Subregional description and biodiversity values in "A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002" published by the Department of Conservation and Land management Western Australia.

Pilbara Flora (2008) Fauna Habitat Assessment - Upgrade of Jimblebar Access Road. Unpublished report prepared for BHP Billiton Iron Ore Pty Ltd, December 2008.

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.

Van Vreeswyk, A.M.E., & Payne, A.L. & Leighton, K.A. &. Hennig, P (2004) An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, Western Australia.

Western Australian Herbarium (1998). FloraBase - The Western Australian Flora. Department of Environment and Conservation. http://florabase.dec.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.