Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1018/1

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 244 SA (AML 70/244); Miscellaneous Licence L47/92,
General Purpose Leases: G52/37, G52/38, G52/56, G52/57, G52/58, G52/70, G52/71, G52/72, G52/73, G52/77, G52/78, G52/90, G52/91, G52/92, G52/93, G52/94, G52/95, G52/97, G52/98, G52/110, G52/111, G52/112, G52/113, G52/114, G52/125, G52/126, G52/127, G52/128, G52/129, G52/130, G52/146, G52/153, G52/154, G52/161, G52/162, G52/168, G52/169, G52/170, G52/176, G52/177, G52/178, G52/184, G52/185, G52/186, G52/191, G52/192, G52/193, G52/199, G52/200, G52/201, G52/206, G52/207, G52/208, G52/214, G52/215, G52/216, G52/217, G52/222, G52/223, G52/224, G52/225, G52/226, G52/231, G52/232, G52/233, G52/234, G52/235, G52/236, G52/237, G52/238, G52/239, G52/240, G52/259, G52/262, G52/276, G52/277, G52/279.

Local Government Area: Shire of East Pilbara

Colloquial name: Mt Whaleback and Orebody 29 minesites

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1200.95		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

The vegetation of the majority of the application area is broadly mapped as:

Beard Vegetation Association 82: hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database; Shepherd, 2007).

Approximately 26 ha, (approximately 2 %) of the application area is broadly mapped as:

Beard Vegetation Association 18: low woodland; mulga (*Acacia aneura*) (GIS Database; Shepherd, 2007).

A vegetation survey of the Mt Whaleback, Orebody 29, Orebody 30 and Orebody 35 minesites, conducted by HGM in 1997, identified nine vegetation associations (BHP Billiton, 2006). A vegetation survey conducted by ENV between 2nd and 13th August 2006 confirmed these nine vegetation associations. ENV (2006b) identified the condition of each vegetation association using the Trudgen Vegetation Condition Scale, which classifies vegetation condition into six categories, ranging from 'Completely Degraded' to 'Excellent'.

Vegetation Associations and Condition:

1) Dense *Acacia citronoviridis* woodland; Vegetation Condition: Poor.

2) Dense *Acacia aneura* woodland; Vegetation Condition: Poor.

3) Open *Acacia aneura* woodland / tall shrubland; Vegetation Condition ranging from Poor to Very Good.

4) Tree steppe of *Eucalyptus leucophloia* over *Triodia basedowii*; Vegetation Condition: Very Good to Excellent.

5) Tree steppe of *Eucalyptus* species over *Triodia wiseana*; Vegetation Condition: Very Good to Excellent.

6) Shrub steppe of *Acacia inaequilatera* over *Triodia basedowii*; Vegetation Condition: Excellent.

7) Shrub steppe of *Acacia inaequilatera* over *Triodia wiseana*: Vegetation Condition: Very Good to Excellent.

8) Shrub steppe of *Acacia bivenosa* over *Triodia pungens*; Vegetation Condition: Very Good.

9) Shrub steppe of *Acacia inaequilatera*, *Eremophila fraseri* over *Triodia pungens*; Vegetation Condition: Very Good (ENV, 2006b).

ENV (2006b) recorded seven weed species within the survey area: Ruby Dock, *Acetosa vesicaria*; Bipinnate Beggartick, *Bidens bipinnata*; Buffel grass, *Cenchrus ciliaris*; Spiked Malvastrum, *Malvastrum americanum*; Black Berry Nightshade, *Solanum nigrum*; and Indian Hedge Mustard, *Sisybrium orientale*. None of the above weed species are classified as a Declared Plant by the Department of Agriculture and Food WA (ENV, 2006b).

(Definitions of Trudgen vegetation condition categories used above:

Poor: Still retains basic vegetation structure or ability to regenerate to it after very obvious impacts of activities of European man such as grazing or partial clearing (chaining) or very frequent fires. Relatively non-aggressive weeds such as *Ursinia anthemoides* or *Briza* species, plus probably some more aggressive weeds such as Ehrharta species.

Very Good: Some relatively slight signs of damage caused by the activities of European man, eg. some signs of damage to tree trunks caused by repeated fire and the presence of some relatively non-aggressive weeds such as *Ursinia anthemoides* or *Briza* species, or occasional vehicle tracks.

Excellent: Pristine or nearly so, no obvious signs of damage caused by the activities of European man.

(Trudgen 2002, as cited in ENV, 2006b).

Astron (2010) conducted a Level 2 flora and vegetation survey of the area surrounding the tailings storage facility in March 2010. This survey covered a total area of approximately 23.5 hectares, and identified the following three vegetation associations:
1. Low Open Woodland of Low Open Woodland of *Eucalyptus leucophloia* subsp. *Leucophloia* over Tall Shrubland of mixed *Acacia* species (*A. synchronicia*, *A. bivenosa* and *A. tenuissima*) over Hummock Grassland of *Triodia brizoides*;
2. Low open woodland of *E. leucophloia* subsp. *leucophloia* (Snappy Gum) over Low Open Woodland of *Acacia aneura* var. *tenuis* (Mulga) over Tall Open Shrubland of *A. bivenosa* and *Hakea chordophylla* over Hummock Grassland of *T. brizoides*; and
3. Low Open Woodland of Low Open Woodland of *E. leucophloia* subsp. *leucophloia* (Snappy Gum) over Open Shrubland of mixed *Acacia* species (*A. adoxa* var. *adoxa, A. pruinocarpa, A.bivenosa, A. maitlandii*) over Low Open Shrubland of *Mirbelia viminalis* over Hummock Grassland of *T. Brizoides* (Astron, 2010).

Astron (2010) recorded two weed species within the survey area surrounding the tailings storage facility, Buffel grass, *Cenchrus ciliaris* and Mimosa Bush, *Vachellia farnesiana.*

Clearing Description

BHP Billiton Iron Ore Pty Ltd have applied to clear up to 1200.95 hectares of native vegetation within a total application area of approximately 1690 hectares. The proposed clearing is for general mining purposes including access roads, overburden storage areas, topsoil stockpiles, and increasing the capacity of the existing tailings storage facility. There are three application areas. The largest (northern) application area wraps around the existing Mt Whaleback mine pit. The southeastern application area surrounds the existing Orebody 29 mine pit. The smallest of the three application areas (southern area) surrounds the existing tailings storage facility, and will be used to raise the wall height of the existing tailings dam to increase its capacity (BHP, 2005b; BHP, 2010).

The application areas are located adjacent to the existing Mt Whaleback and Orebody 29 opencut iron ore mines, which are located approximately 5 km west of the town of Newman, in the Pilbara region. The mine at Mt Whaleback commenced operations in 1969. The existing mine pit is approximately 5.5km long, and approximately 1.8km wide at its widest point. Existing overburden (waste rock) storage areas surround the mine pit, and additional overburden storage areas (OSA's) are required to continue the mining operations.

The clearing permit application is for a five year period, and the area outlined includes all those areas which may be subject to progressive clearing for general mining purposes over the next five years. The entire area applied for is not expected to be cleared, but has been included to allow for flexibility in mine planning. The majority of the clearing is expected to be for the establishment of new overburden storage areas. Areas used for overburden storage will be progressively rehabilitated over the life of the mine. Prior to clearing, all topsoil from these areas will be removed and stockpiled for use in later rehabilitation works.

Vegetation Condition

Overall, the vegetation within the application areas was considered to be in Good to Excellent condition, according to the Trudgen vegetation condition scale (ENV, 2006b), although Astron (2010) reported localised areas as Completely Degraded, adjacent to the Tailings Storage Facility.

Good: More obvious signs of damage caused by the activities of European man, including some obvious impact on the vegetation structure such as caused by low levels of grazing or by selective logging. Relatively non-aggressive weeds such as *Ursinia anthemoides* or *Briza* species, plus some more aggressive weeds such as *Ehrharta* species. (Trudgen 2002, as cited in ENV, 2006b.)

To

Excellent: Pristine or nearly so, no obvious signs of damage caused by the activities of European man.

(Trudgen 2002, as cited in ENV, 2006b.)

Comment

This clearing permit application was referred to the Environmental Protection Authority (EPA) by the Department of Mines and Petroleum (DMP). The EPA determined that the proposed clearing could be adequately managed by the Clearing Regulations under Part V of the *Environmental Protection Act 1986*. (Refer to Planning Instruments section at the end of this report for more details of the EPA's decision and recommendations.)

As part of the assessment of this clearing permit application, DMP obtained advice from:

- the Department of Environment and Conservation (DEC), on issues relating to flora, fauna, biodiversity, and conservation lands;
- the Department of Agriculture and Food (DAFWA), on issues relating to land degradation;
- the Department of Water (DoW), on issues relating to a Public Drinking Water Source Area.

The DMP Assessing Officer and a DEC Officer conducted a site inspection of the clearing permit application 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 is not likely to be at variance to this Principle

Approximately 240 flora taxa have been identified within the clearing permit application areas (ENV, 2006b). DEC (2006) have advised that the species richness of the site is comparable with other adjacent areas of similar size and supporting similar landforms (DEC, 2006). DEC noted that the vegetation was in good to excellent condition with small areas experiencing some form of degradation, and that the broad vegetation types identified and mapped in previous surveys were confirmed to be still present in the project area (DEC, 2006).

The area under application has been more comprehensively surveyed for terrestrial fauna, compared to other development areas in the Pilbara region (ENV, 2006a). DEC considers that the flora and fauna assessments have demonstrated adequately that the vegetation under application is representative of other areas in the Ophthalmia Range and is not restricted in nature, or of significant biodiversity value (DEC, 2006).

BHP Billiton has prepared a Significant Species Management Plan, which aims to minimise impacts on flora and fauna species of conservation significance. DEC advises that, provided the proponent adheres to the Significant Species Management Plan, the proposed clearing is unlikely to be at variance to this Principle (DEC, 2006).

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

Methodology

DEC (2006).
ENV (2006a)
ENV (2006b).

(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

A fauna survey of the application area was conducted in accordance with EPA Guidance Statement No. 56, by ENV Australia environmental consultants, between the 1st and 11th of September 2006 (ENV, 2006a). Seven fauna habitat types were identified, broadly associated with major topographical features: 1) Range crests; 2) Range Slopes; 3) Breakaways; 4) Gorges and Gullies; 5) Riverine areas; 6) Minor Drainage lines; 7) Valley Plains. The fauna survey included six trapping grids, using cage traps, Elliot traps and pit traps, and all the main habitat types were represented (ENV, 2006a). Bird species were surveyed during the day, by opportunistic survey, along transects throughout the survey area. In addition, opportunistic nocturnal surveys were conducted in spotlighting transects along existing tracks through the application areas. Nocturnal bat species were surveyed using echolocation recording, in suitable habitat areas (ENV, 2006a).

The survey recorded a total of 97 species of vertebrate fauna, including 19 mammal species, 28 reptile species and 50 bird species. Two fauna species of conservation significance were recorded. The Yellow-bellied sheath-tail bat, *Saccolaimus flaviventris*; and the Rainbow bee-eater, *Merops ornatus*, (a migratory bird), are both listed as Lower Risk/Near Threatened (the least threatened category) on the IUCN Red List. The bat species is highly mobile and it is unlikely that the proposed clearing will have any significant impact on its habitat. The Rainbow Bee-eater has a wide distribution across Australia, covering a broad habitat range, and is similarly unlikely to be significantly impacted (ENV, 2006a).

Although *Petrogale* sp. were recorded within the application area, it is unclear whether the individuals sighted were the Black-footed Rock Wallaby *Petrogale lateralis lateralis* (VU), or the more common Rothschild's Rock Wallaby, as the ranges of these two species appear to overlap, and they are difficult to distinguish from each other (ENV, 2006a).

Another species of conservation significance, the Western Pebble-mound Mouse, *Pseudomys chapmani* (P4) is known to occur in the surrounding area, and was previously recorded in a survey conducted by Ecologia in 1998. However it was not recorded during the 2006 survey (ENV, 2006a). This species is relatively widespread in the Pilbara, and is well represented in areas outside the minesite.

The Long-tailed Dunnart, *Sminthopsis longicaudata* (P4) was recorded in an adjacent area during a previous survey conducted by Ecologia in 1997/1998. There is suitable habitat for this species within the application area, however this species was not recorded during the 2006 survey (ENV, 2006a). As the more common Striped-faced Dunnart was frequently captured during the survey, it was concluded that the Long-tailed Dunnart was unilkely to inhabit the application area (ENV, 2006a).

A further thirteen fauna species of conservation significance were considered to have the potential to occur within the application area, based on known distributions and habitat preferences. These included four mammal species: Mulgara, *Dasycercus cristicauda* (VU); Northern Quoll, *Dasyurus hallucatus* (EN); Orange

Leaf-nosed Bat, *Rhinonicteris aurantius* (VU); and Ghost Bat, *Macroderma gigas* (VU); three reptile species: Pilbara Olive Python, *Liasis olivaceus barroni* (VU); Unpatterned Robust Lerista, *Lerista macropisthopus remota* (P2); and Blind snake, *Ramphotyphlops ganei* (P1); and six bird species: Night Parrot, *Pezoporus occidentalis* (CR); Peregrine Falcon, *Falco peregrinus* (Schedule 4); Grey Falcon, *Falco hypoleucos* (P4); Australian Bustard, *Ardeotis australis* (P4); Bush Stone-curlew, *Burhinus grallarius* (P4); and Star Finch, *Neochimia ruficauda subclarescens* (P4). However none of these species were recorded in either the 1997, 1998 or 2006 fauna surveys (ENV, 2006a).

Mammal species recorded in the 2006 survey included the Fox, *Vulpes vulpes*, and the Feral Cat, *Felis catus*, both of which were not recorded during surveys conducted in 1997 and 1998 (ENV, 2006a).

BHP Billiton has prepared a Significant Species Management Plan, which aims to minimise impacts on fauna species of conservation significance. The location of significant fauna species, their habitat and significant vegetation will be recorded. BHP Billiton will report on activities undertaken to monitor and manage significant species, as part of the Annual Environmental Report submitted to DMP each year (BHP Billiton, 2006).

Many biological surveys have been conducted in the Pilbara Bioregion, over several years, mainly on behalf of the mining industry (ENV, 2006a). Approximately 10 terrestrial fauna surveys have been undertaken in the vicinity of the Ophthalmia Ranges, which are located approximately 5 km to the north of the Mt Whaleback minesite, and extend to the east of Newman. Two previous fauna surveys were conducted within the Mount Whaleback mine project area in 1997 and 1998. The fauna habitats occurring within the clearing permit application areas are not likely to be unique or restricted in distribution, and are not considered to have any special conservation significance. All of the habitat types within the application areas are well represented within the wider Pilbara region (Astron, 2010; BHP Billiton, 2010; ENV, 2006a).

The three fauna surveys conducted within the Mt Whaleback project area have recorded a cumulative total of 32 mammals, 54 reptiles, 80 birds and 3 frog species (ENV, 2006a). This represents 65% of the total expected terrestrial vertebrate fauna for the Ophthalmia Ranges. The 2006 survey also identified a number of species which were not recorded in the previous surveys. DEC (2006) considers that; the results of the fauna assessment surveys of the Mt Whaleback area, have enabled a comprehensive characterisation of the Mt Whaleback area from a faunal perspective. DEC is confident that the fauna habitat present at Mt Whaleback has now been adequately surveyed to ascertain the conservation significance of the area under application, and it would appear that the area does not contain habitat which is restricted to the application area. The surveys have adequately demonstrated that the vegetation and fauna habitats proposed to be cleared are adequately represented in a broader context in the Ophthalmia Range (DEC, 2006).

DEC will be providing ongoing advice and consultation to the proponent on the content and implementation of the Significant Species Management Plan (SSMP), which is intended to provide clear management objectives and procedures to protect and minimise the impact of mining activities on conservation significant fauna. Based on the proponent successfully adopting the management protocols of the SSMP, it is unlikely that the proposed clearing will impact on significant fauna habitats (DEC, 2006).

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

Methodology

Astron (2010).
BHP Billiton (2006).
BHP Billiton (2010).
DEC (2006).
ENV (2006a).

(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 populations of Declared Rare Flora (DRF) within the clearing permit application areas (Astron, 2010; ENV, 2006b; GIS Database). The nearest known populations of DRF are six populations of *Lepidium catapycnon*, which occur to the northwest of the application area. The nearest of these populations is located approximately 80m outside the boundary of the application area, while the other five populations are located between approximately 200m and approximately 1km outside the boundary of the application area (GIS Database). DEC has advised that the proposed clearing is unlikely to have any impact on these populations (DEC, 2006).

A flora survey of the Mt. Whaleback area, conducted by BHP Billiton Iron Ore Environment Department in 1999, specifically targeted *Lepidium catapycnon,* which is known to occur in the Mount Whaleback area (BHP Billiton, 2005b). The survey objectives were to locate and describe the distribution and abundance of this species, to contribute to a better understanding of its ecology. Thirty six sub-populations were found during the study, concentrated in an area 3-4km west/north-west of the Mt Whaleback minesite. The study found that the species has a strong habitat preference for steep hill slopes (BHP Billiton, 2005b).

A flora and vegetation survey of the clearing permit application area and surrounding areas at Mount Whaleback and Orebody 29 minesites was conducted by ENV Australia environmental consultants between the

2nd and 13th August 2006 (ENV, 2006b). The survey was conducted in accordance with EPA Guidance Statement 51, and included a total of 81 quadrats (50m x 50m), representing all the vegetation types occurring within the application areas. The survey included a targeted search for Declared Rare and Priority flora, particularly focusing on habitat suitable for *Lepidium catapycnon* (R). Two populations of *L. catapycnon* were recorded, totalling 33 individual plants. Both of these populations were located outside the clearing permit application area. No other DRF species were recorded during the 2006 survey (ENV, 2006b), or during a 2010 survey of the areas surrounding the tailings storage facility (Astron, 2010).

A search of DEC databases, conducted by ENV, revealed 19 Priority Flora species with the potential to occur within the application area, based on known distributions. However, none of these species were recorded during the surveys of the application area (Astron, 2010, ENV, 2006b).

Two flora species which may be of conservation significance were recorded during the ENV survey: a potentially new species of *Wedelia*; and a potentially new species of *Corymbia*, similar to *Corymbia eremaea* (ENV, 2006b). Depending on the results of further taxonomic investigation, these species may become Priority flora species in the future. DEC recommends that the proponent pursue further study to ascertain the conservation significance of these taxa (DEC, 2006).

BHP Billiton has prepared a Significant Species Management Plan, which aims to minimise impacts on flora species of conservation significance. The location of significant flora species, their habitat and significant vegetation will be recorded. BHP Billiton will report on activities undertaken to monitor and manage significant species, as part of the Annual Environmental Report submitted to DMP each year (BHP Billiton, 2006).

DEC will be providing ongoing advice and consultation to the proponent on the content and implementation of the Significant Species Management Plan, which is intended to provide clear management objectives and procedures to protect and minimise the impact of mining activities on conservation significant flora. Provided the proponent successfully adopts the management protocols of the plan, it is unlikely that the proposed clearing will have any significant impact on flora of conservation significance (DEC, 2006).

The flora associations and species richness within the application areas are similar to adjacent areas, and no Declared Rare or Priority flora species are likely to be impacted by the proposed clearing (DEC, 2006; ENV, 2006b).

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

Methodology

Astron (2010).
BHP Billiton (2005b).
BHP Billiton (2006).
DEC (2006).
ENV (2006b).
GIS Database:
- Declared Rare and Priority Flora List.
- Pre-European Vegetation.

(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) within the areas applied to clear (GIS Database). The nearest known TEC is the Ethel Gorge aquifer stygobiont community which is located approximately 15 km east of the northern application area (GIS Database).

DEC confirms that there are no known TEC's located within the application area, or in close proximity to the application area (DEC, 2006).

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

Methodology

DEC (2006).
GIS Database:
- Threatened Ecological Sites Buffered.

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

Comments

Proposal is not at variance to this Principle

The application area falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Shepherd (2007) reports that approximately 99.95% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion. Approximately 26 ha (approximately 2%) of the application area is broadly mapped as Beard Vegetation Association 18: low woodland; mulga (*Acacia aneura*) (GIS Database; Shepherd, 2007). The remainder of the application area (approximately 98%) is mapped as Beard Vegetation Association 82: hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*. Shepherd (2007) reports that there is approximately 99.99% of these vegetation types remaining, and 2.1% and 10.2% respectively, in reserves.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,188	17,794,647	~99.95	Least Concern	6.3
Beard vegetation associations - WA					
18	19,892,305	19,890,195	~99.99	Least Concern	2.1
82	2,565,901	2,565,901	~99.99	Least Concern	10.2
Beard vegetation associations - Pilbara Bioregion					
18	676,557	676,557	~100	Least Concern	16.8
82	2,563,583	2,563,583	~100	Least Concern	10.2

* Shepherd (2007)
** Department of Natural Resources and Environment (2007)

Although large scale mining operations are located in close proximity to the application area, the region in which the clearing is proposed to occur has not undergone broad scale clearing. Hence the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared (DEC, 2006).

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

Methodology

DEC (2006).
Dept of Natural Resources and Environment (2002).
Shepherd (2007).
GIS Database:
- Pre-European Vegetation.
- IBRA WA (Regions – Sub Regions).

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

Comments

Proposal may be at variance to this Principle

There are no permanent watercourses or wetlands within the areas proposed to clear (GIS Database). Creeks in the surrounding area are dry for most of the year, only flowing briefly immediately following significant rainfall (BHP Billiton, 2005b).

There are several minor seasonal creeklines within the application areas (GIS Database). Buffer zones of vegetation will be left along creeklines, and overburden storage areas will be set back a minimum of 10m from the creekline buffer zone (BHP Billiton, 2005b).

Based on the above, the proposed clearing may be at variance to this Principle. However, the proposed clearing is unlikely to have any significant impact on any watercourse or wetland.

Methodology

BHP Billiton (2005b).
GIS Database:
- Hydrography, Linear.

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

Comments

Proposal is not likely to be at variance to this Principle

The application area lies within the Newman, Rocklea and Elimunna Land Systems.

The Newman Land System consists of lower slopes, with stony soils and some red loamy earths; narrow drainage floors up to 400m in width with stony mantles on shallow red loam soils; and lower stony plains with stony soils, shallow loams or loamy earth soils. The Newman Land System soils are not particularly prone to soil erosion (DAFWA, 2006).

The Rocklea Land System consists of lower slopes of shallow red loams or duplex soils that usually have protective stone mantles; stony plains of shallow red loam, sand or clay soils; and drainage line and drainage floor land units with a range of often shallow soils. The Rocklea Land System is quite resistant to soil erosion in its natural state (DAFWA, 2006).

The Elimunna Land System consists of hills and low rises with stony soils on shallow red loams; Groves land unit on red loamy earth soils; and drainage floors with self mulching cracking clay soils. The Elimunna Land System is also reasonably resistant to soil erosion, however soil disturbance or altered water flows may cause localised soil erosion (DAFWA, 2006).

DAFWA (2006) advised that the proposed clearing is unlikely to cause appreciable land degradation, however there is some risk of soil erosion. This risk can be minimised provided that surface-water runoff is adequately managed on and around overburden storage areas (DAFWA, 2006).

The proponent has advised that appropriate measures will be implemented to minimise erosion and surface-water run-off. Buffer zones of vegetation will be left along creeklines, and overburden storage areas will be set back a minimum of 10m from the creekline buffer zone (BHP Billiton, 2005b). Weed control measures will be implemented to control the spread of weeds (BHP Billiton, 2006).

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

Methodology

BHP Billiton (2005b).
BHP Billiton (2006).
DAFWA (2006).

(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 areas in the vicinity of the application area. The nearest DEC managed lands are the Collier National Park, approximately 115km south/southwest of the application area; and the Karijini National Park, approximately 110km west/northwest of the application area (GIS Database).

This proposal is unlikely to have any impact on any conservation area, based on the large distance to the nearest conservation reserve (DEC, 2006).

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

Methodology

DEC (2006).
GIS Database:
- DEC Tenure.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments

Proposal is not likely to be at variance to this Principle

The application area is located within the Newman Water Reserve, a Public Drinking Water Source Area (PDWSA) (GIS Database). The Department of Water considers that any impacts on ground or surface water quality resulting from the additional clearing within the PDWSA can be adequately managed and monitored by the existing Ground Water Licence Operating Strategy for Newman (DoW, 2006). Groundwater quality monitoring is conducted as part of the existing mine operations at the Mt Whaleback minesite (BHP Billiton, 2005b).

Creeklines and gullies within the application area feed into Whaleback Creek, which feeds into the Fortescue River. Creeklines are dry most of the year, only flowing briefly following significant rainfall (BHP Billiton, 2005b). Appropriate surface water management practices will be implemented to minimise erosion and minimise potential impacts on the quality of surface water (BHP Billiton, 2005b).

The proposed clearing is unlikely to cause deterioration in the quality of any surface or underground water. Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BHP Billiton (2005b).
DoW (2006).
GIS Database:
- Hydrography, Linear.
- 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

There are no permanent watercourses within the application area (GIS Database). Creeklines are dry most of the year, only flowing briefly following significant rainfall (BHP Billiton, 2005b).

Average annual rainfall at Mt Whaleback is 314 mm, and the average annual evaporation exceeds the annual rainfall by as much as 2500 mm per year (BHP Billiton, 2005b). Natural flooding occurs occasionally during the wet season (November to March) following significant rainfall (BHP Billiton, 2005b). The proposed clearing is not likely to cause or exacerbate 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 (2005b).
GIS Database:
- Hydrography, Linear.

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

Comments

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.

This clearing permit application was referred to the EPA by DMP, as it was for a very large area of vegetation clearing, located within a Public Drinking Water Source Area, which triggered one of the referral criteria in the Memorandum of Understanding between DMP and the EPA. The EPA determined that the proposed clearing could be adequately managed by the Clearing Regulations under Part V of the *Environmental Protection Act 1986*. However, the EPA raised concerns regarding the existence of Declared Rare Flora within the application area and recommended that additional flora and fauna surveys of the application area be undertaken. As a result of these recommendations and subsequently completed surveys, the clearing permit application area was amended, to excise all known populations of Declared Rare Flora from the application area. The EPA further advised the proponent to liaise with the Department of Water to ensure protection of the public drinking water supply, and to liaise with the Department of Environment and Conservation regarding the implementation of an appropriate dust management plan (EPA, 2006).

When the amended application was readvertised, one public submission was received, raising concerns regarding potential impacts of the proposed clearing on Aboriginal Heritage sites within the application area. 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, 2005a). BHP Billiton has a heritage protocol agreement with the traditional owners of Mt Whaleback, and regularly consult with the traditional owners to undertake Aboriginal heritage surveys in and around Newman (BHP Billiton, 2005b). 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, 2005a).

There are approximately 40 Aboriginal Sites of Significance recorded as occurring wholly or partly within the clearing permit application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

There is a native title claim (WC99/004) over the area under application. This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. 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 (ie. 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*.

Methodology BHP Billiton (2005a).
BHP Billiton (2005b).
EPA (2006).
GIS Database:
- Aboriginal Sites of Significance.
- Native Title Claims.

4. Assessor's comments

Comment

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the *Environmental Protection Act 1986*, and the proposed clearing may be at variance to Principle (f), is not at variance to Principle (e), and is not likely to be at variance to Principles (a), (b), (c), (d), (g), (h), (i), and (j).

5. References

Astron (2010) BHP Billiton Iron Ore - Mt Whaleback TSF Flora, Vegetation and Fauna Assessment. Astron Environmental Services, Western Australia.

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

BHP Billiton (2005b) Application for a Clearing Permit (purpose permit) Mt Whaleback. BHP Billiton Iron Ore Pty Ltd, Western Australia.

BHP Billiton (2006) Newman - Mt Whaleback, Orebody 29, 30 and 35 mine Sites - Significant Species Management Plan, Revision 1. BHP Billiton Iron Ore Pty Ltd, Western Australia.

BHP Billiton (2010) Mount Whaleback Tailings Storage Facility. BHP Billiton Iron Ore Pty Ltd, Western Australia.

DAFWA (2006) Land degradation assessment report. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP). Office of the Commissioner of Soil and Land Conservation, Department of Agriculture and Food, Western Australia.

DEC (2006) Land clearing proposal advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP). Department of Environment and Conservation, 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.

DoW (2006) Public Drinking Water Source Area (PDWSA) Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP). Department of Water, Western Australia.

ENV (2006a) Mount Whaleback Fauna Assessment Survey - Phase 111 Summary Report. ENV Australia, Western Australia.

ENV (2006b) Mount Whaleback Flora and Vegetation Assessment - Phase 111 Summary Report. ENV Australia, Western Australia.

EPA (2006) Native vegetation clearing at Mt Whaleback for overburden storage set at Not Assessed - Public Advice Given. A letter from EPA to BHP Billiton Iron Ore Pty Ltd. Environmental Protection Authority, Western Australia.

Shepherd, D.P. (2007) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DMP	Department of Mines and Petroleum, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	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.