Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1565/2
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: Mt Whaleback RGP4 Newman Hub Expansion Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
135.84		Mechanical Removal	Mineral Production and Associated Activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 24 November 2011

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 for the whole of Western Australia. One Beard vegetation association has been mapped within the application area:

82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database; Shepherd, 2009).

The application area was surveyed by staff from Biota in 2001, Ecologia Environment in 2004 and ENV in 2006 (Biota, 2001; Ecologia Environment, 2004; ENV, 2006a). The following vegetation types were identified within the application area:

1. *Acacia pruinocarpa* and *Corymbia hamersleyana* dominated woodland with scattered *Acacia aneura* over mixed shrubs over *Cenchrus setigerus*;

2. *Eucalyptus victrix* and *Acacia citrinoviridis* woodland over *Cenchrus setigerus*;

3. *Acacia monticola* over *Triodia basedowii*;

4. *Hakea chordophylla* over mixed scattered shrubs over *Triodia basedowii*;

5. Open *Eucalyptus leucophloia* subsp. *leucophloia* over *Acacia hamersleyensis* and *Acacia bivenosa*, with a mixed *Triodia pungens*, *Triodia basedowii* ground layer;

6. *Eucalyptus victrix* open woodland over *Acacia citrinoviridis* low open forest over *Triodia pungens* hummock grassland and/or *Cenchrus ciliaris* open tussock grassland;

7. *Eucalyptus xerothermica, Acacia aneura* low woodland over *Triodia pungens* variable hummock grassland;

8. *Petalostylis labicheoides, Acacia bivenosa, Acacia pachyacra, Acacia pyrifolia* open scrub over *Triodia pungens* open hummock grassland and mixed tussock grassland;

9. *Acacia aneura* low open woodland to high open shrubland over *Triodia pungens* hummock grassland and mixed tussock grassland;

10. *Eucalyptus leucophloia* scattered low trees over *Triodia basedowii* hummock grassland;

11. *Eucalyptus leucophloia* scattered low trees over *Triodia wiseana* mid-dense hummock grassland;

12. Low *Eucalyptus victrix* woodland over open *Acacia citrinoviridis* scrub over an open *Cenchrus ciliaris* tussock grassland (Creek Bed);

13. Scattered *Eucalyptus leucophloia* subsp. *leucophloia* trees over a low open *Acacia citrinoviridis* forest over a closed *Cenchrus ciliaris* grassland over an open *Bidens bipinnate* herb land (Floodplain);

14. Low open *Corymbia ferriticola* subsp. *ferriticola, Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* woodland over an *Acacia* aff. *aneura* (narrow fine veined) and *Acacia pruinocarpa* shrubland over a *Cenchrus ciliaris* grassland (Floodplain); and

15. A low *Corymbia ferritcola* subsp. *ferriticola* and *Eucalyptus victrix* woodland over a high *Acacia citrinoviridis* and *Acacia* aff. *aneura* (narrow fine veined) over a *Cenchrus ciliaris* and *Themeda triandra* hummock/tussock grassland (Floodplain).

Clearing Description

BHP Billiton Iron Ore Pty Ltd (BHPBIO) is proposing to clear up to 135.84 hectares of native vegetation within an area of approximately 554.73 hectares for mineral production, constructing the Newman Hub Expansion Works and its associated infrastructure, haul roads, laydown areas, minor borrow pits, and topsoil stockpile areas.

Vegetation will be cleared using a dozer. All cleared topsoil and vegetation will be stockpiled for use in rehabilitation.

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);

To

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

Comment

The application area is located in the Pilbara region of Western Australia and is situated approximately 2 kilometres west of Newman (GIS Database).

Clearing permit CPS 1565/1 was granted by the Department of Mines and Petroleum (DMP) on 2 June 2011, and was valid from 2 June 2011 to 18 March 2012. The clearing permit authorised the clearing of up to 135.84 hectares of native vegetation. An application for an amendment to clearing permit CPS 1565/1 was submitted to DMP on 3 October 2011. BHPBIO has applied to amend the purpose to mineral production and associated activities, extend the duration of the permit for an additional five years, and change the annual reporting date. The amount of clearing and the clearing area boundary that was approved under clearing permit CPS 1565/1 will remain unchanged.

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 occurs within the Hamersley (PIL3) sub-region of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This sub-region is characterised by sedimentary ranges and plateaux, dissected by gorges (CALM, 2002). At a broad scale, vegetation can be described as Mulga low woodlands over bunch grasses on fine textured soils in valley floors and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

The flora of the application area was recorded as five main vegetation associations in the Ecologia Environment survey in 2004, six main vegetation associations in the Halpern Glick and Maunsell survey in 1997, and four vegetation associations in the ENV survey in 2006 (Biota, 2001; Ecologia Environment, 2004; ENV, 2006a; ENV, 2006b). The vegetation types and fauna habitats found within the application area are all well represented both within the immediate vicinity of the application area and in the Newman and eastern Pilbara regions (Biota, 2001; Ecologia Environment, 2004; ENV, 2006; GIS Database). No vegetation units of restricted distribution and no species of Rare or Priority flora are known to occur within the application area (Biota, 2001; Ecologia Environment, 2004; ENV, 2006a; ENV, 2006b). Some flora and fauna of conservation significance are known to occur within the local area, however these species are not expected to be impacted as a consequence of the proposed clearing (BHPBIO, 2006a; GIS Database).

Eleven alien weed species were recorded within the application area (Ecologia Environment, 2004; BHPBIO, 2006a; ENV, 2006a). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. One species, namely *Argemone ochroleuca* subsp. *ochroleuca* (Mexican Poppy) is listed as a 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Agriculture and Food (DAFWA). Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The application area is located adjacent to the existing Mount Whaleback and Orebody 29 open cut iron ore mines, which are located approximately 5 kilometres west of Newman, in the Pilbara region. BHPBIO is currently implementing a range of projects to expand the capacity of its existing WA iron ore operations. The current proposal involves the construction of crushing and screening, stockpile and train load out facilities as part of the Newman Hub Expansion Works.

Ecologia Environment (2004) reported that the majority of the vegetation associations present within the application area had been disturbed to varying degrees because of the mining activity associated with the adjacent Whaleback minesite. As a result, Ecologia Environment considered that the conservation significance of the vegetation within the surveyed project area is negligible (Ecologia Environment, 2004).

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

Methodology

BHPBIO (2006a)
Biota (2001)
CALM (2002)
Ecologia Environment (2004)
ENV (2006a)
ENV (2006b)
GIS Database:
- IBRA WA (Regions - Subregions)
- Pre-European Vegetation

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

Comments

Proposal is not likely to be at variance to this Principle

According to Shepherd (2009) approximately 99.89% of the pre-European vegetation remains within the Hamersley bioregion. Given the extent of native vegetation remaining in the local area and bioregion, the vegetation to be cleared does not represent a significant ecological linkage.

Ecologia Environment undertook Phase I and Phase II biological assessment surveys in 1997 and 1998. ENV Australia Pty Ltd (ENV) was commissioned in July 2006 by BHP Billiton Iron Ore Pty Ltd (BHPBIO) to undertake the Phase III biological assessment survey of the Mount Whaleback and Orebody 29 project areas (ENV, 2006c).

Two fauna species of conservation significance were recorded within the application area:
- Yellow-bellied sheath-tail bat (*Saccolaimus flaviventris*) - IUCN Redlist; and
- Rainbow bee-eater (*Merops ornatus*) - *Environment Protection and Biodiversity Conservation Act 1999* (ENV, 2006c).

Both these species are highly mobile and it is unlikely that the proposed clearing will have any significant impact on their habitat (ENV, 2006c).

Species known to potentially occur in the local area based on the Department of Environment and Conservation (DEC) Threatened and Priority Fauna database include the:

- Woma (*Aspidites ramsayi*) (P1)
- Australian Bustard (*Ardeotis australis*) (P4);
- Grey Falcon (*Falco hypoleucos*) (P4);
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (P4);
- Major Mitchell's Cockatoo (*Cacatua leadbeateri*) (Schedule 4); and
- Peregrine Falcon (*Falco peregrinus*) (Schedule 4) (DEC, 2010).

The above species are all wide-ranging and the vegetation types described within the application area are common and well represented within the Newman and eastern Pilbara areas (BHPBIO, 2006b). It is unlikely that the proposed clearing will have an impact on significant fauna habitat.

In addition, the Pilbara Olive Python (*Morelia olivacea barroni*) (Schedule 1), and the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantius*) (Schedule 1), are expected to occur within this region (Ecologia Environment, 2004), however they have not been recorded within the area applied to clear.

BHPBIO has prepared a Significant Species Management Plan (SSMP), 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. BHPBIO will report on activities undertaken to monitor and manage significant species, as part of the Annual Environmental Report submitted to the Department of Mines and Petroleum each year (BHPBIO, 2006b). DEC will provide ongoing advice and consultation to BHPBIO on the content and implementation of the 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 BHPBIO successfully adopting the management protocols of the SSMP, it is unlikely that the proposed clearing will impact on significant fauna habitats (DEC, 2007).

Clearing within the application area is unlikely to have any significant impact on fauna habitat in the region given that the area is already highly disturbed and is located between two operational mine pits. The fauna habitats occurring within the application area are not likely to be unique or restricted in distribution, and are not considered to have any special conservation significance (ENV, 2006c). Fauna surveys of the Mt Whaleback area have demonstrated that the vegetation and fauna habitats within the application area are represented in a broader context in the Ophthalmia Range (DEC, 2007).

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

Methodology

BHPBIO (2006b)
DEC (2007)
DEC (2010)
Ecologia Environment (2004)
ENV (2006c)
Shepherd (2009)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available GIS databases there are no known records of Declared Rare Flora (DRF) within the application area (GIS Database). The nearest known DRF are six populations of *Lepidium catapycnon*, which occur approximately 5 kilometres north west of the application area (GIS Database). The proposed clearing is not likely to impact these populations.

A flora survey was conducted over the application area and surrounding areas by staff from ENV Australia Pty Ltd (ENV) between 2 and 13 August 2006 (ENV, 2006a; ENV, 2006b). Two populations of *Lepidium catapycnon* were recorded during the survey, totalling 33 individual plants. Both of these populations are located outside the application area. No DRF species were recorded as occurring within the application area during the survey (ENV, 2006b).

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

Methodology

ENV (2006a)
ENV (2006b)
GIS Database:
- Threatened and Priority Flora

(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

A search of available databases reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest TEC (Ethel Gorge) is located approximately 3 kilometres east of the application area (GIS Database). At this distance there is little likelihood of any impact to the TEC from the proposed clearing.

Advice received from the Department of Environment and Conservation states that there are no known TECs located within the application area or in close proximity to the application area (DEC, 2007).

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

Methodology

DEC (2007)
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 clearing application area falls within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 99.89% of the pre-European vegetation remains (GIS Database; Shepherd, 2009).

The vegetation of the clearing application area has been mapped as Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database; Shepherd, 2009).

According to Shepherd (2009) approximately 100% of Beard vegetation association 82 remains at both the state and bioregional level (see table).

According to the Bioregional Conservation Status of Ecological Vegetation Classes, the conservation status for the Pilbara Bioregion and Beard vegetation association 82 is of "Least Concern" (see table) (Department of Natural Resources and Environment, 2002).

Only a small percentage of Beard vegetation association 82 is protected within conservation reserves, however, the bioregion remains largely uncleared. As a result, the conservation of the vegetation association within the bioregion is not likely to be impacted on by this proposal.

	Pre-European Area (ha)*	Current Extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,193	17,785,001	~99.89%	Least Concern	~6.32%
Beard Vegetation Associations - State					
82	2,565,901	2,565,901	~100%	Least Concern	~10.24%
Beard Vegetation Associations - Bioregion					
82	2,563,583	2,563,583	~100%	Least Concern	~10.25%

* Shepherd (2009)
** Department of Natural Resources and Environment (2002)

The vegetation under application is not a remnant of vegetation in an area that has been extensively cleared.

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (Regions - Subregions)
- 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 no permanent watercourses or wetlands within or associated with the area applied to clear (GIS Database). Creeks in the surrounding areas are dry for most of the year, only flowing briefly immediately after significant rainfall (BHPBIO, 2006a). Whaleback Creek flows intermittently through the application area, however, as part of the Newman Hub Expansion works, part of Whaleback Creek will be diverted (BHPBIO, 2006a).

A permit to disturb the bed and banks of Whaleback Creek has been approved by the Department of Water (DoW) for the varying Newman Hub Expansion designs. Part of the assessment process included assessing the riparian vegetation that occurred along the banks of Whaleback Creek (BHPBIO, 2006a).

There is vegetation growing in association with Whaleback Creek, however the vegetation assemblages present are well represented in the Pilbara and did not contain any Rare or Priority species of flora (Ecologia Environment, 2004). Much of the application area is degraded due to the long term impacts of anthropogenic activity. The ENV (2006a) survey described the condition of the vegetation within the site associated with Whaleback Creek to be very poor with noticeable weed communities and vehicular disturbance.

The proposed clearing is unlikely to have any significant impact on any watercourse or wetland.

Based on all of the above, the proposed clearing is at variance to this principle.

Methodology BHPBIO (2006a)
Ecologia Environment (2004)
ENV (2006a)
GIS Database:
- Geodata, Lakes
- Hydrography, Linear

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

Comments

Proposal may be at variance to this Principle

The application area has been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al., 2004). According to available datasets the application area intersects the Newman, River and Rocklea land systems (GIS Database).

The Newman land system consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). The Newman land system covers approximately 121.7 hectares of the application area (21.9%). Some parts of this land system may be slightly susceptible to erosion if vegetative cover is lost (Van Vreeswyk et al., 2004). The River land system is comprised of active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands (Van Vreeswyk et al., 2004). The River land system covers approximately 143 hectares of the application area (25.8%) and may be highly susceptible to erosion if vegetative cover is lost (GIS Database; Van Vreeswyk et al., 2004). The Rocklea land system is comprised of basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands (Van Vreeswyk et al., 2004). The Rocklea land system covers approximately 5.03 hectares of the application area (0.9%) and has a very low erosion risk (GIS Database; Van Vreeswyk et al., 2004). Furthermore, approximately 285 hectares (51.4%) of the application area is covered by disturbed areas (GIS Database).

The proposed clearing of up to 135.84 hectares of native vegetation within the application area for the purposes of mineral production and expanding the Newman Hub, which includes associated mine infrastructure, haul roads, laydown areas, borrow pits and topsoil stockpiles, is likely to permanently impact on large areas across the application area. It appears likely that the clearing of native vegetation may increase the risk of soil erosion occurring. However, the majority of the clearing is for the purpose of establishing mine site infrastructure that is likely to become permanent or long-term features within the application area. As the cleared area will be utilised by various pieces of large-scale mine infrastructure, the risk of erosion occurring on these particular land units will be minimised. It is most likely that the cleared area will be particularly susceptible to erosion immediately after the native vegetation has been cleared, and during the period that the cleared areas are left exposed. Potential erosion impacts as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition to ensure large areas are not void of vegetative cover for extended periods.

According to GIS databases there are no permanent wetlands or watercourses within the application area; however, numerous ephemeral drainage lines pass through the application area (GIS Database). There is the potential for unnatural sedimentation and catchment reduction as a result of the proposed clearing.

The proposed clearing activities will involve significant disturbance to a large area of native vegetation, and in addition the proposed clearing is likely to disturb the structure of surface soils and the underlying mantles. The use of heavy machinery, and also light vehicles, during clearing activities is likely to cause some degree of soil compaction, which may adversely impact soil structure. Advice received from the Department of Agriculture and Food WA (DAFWA) states that the 'the soil types (stony soils and red loamy earths) occurring on the site would be expected to erode after clearing/disturbances if surface water is not managed as proposed' (DAFWA, 2006).

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

Methodology

DAFWA (2006)
Van Vreeswyk et al. (2004)
GIS Database:
- Geodata, Lakes
- Hydrography, Linear
- Rangeland Land System Mapping

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments

Proposal is not likely to be at variance to this Principle

The proposed clearing is not located within a conservation reserve (GIS Database). The nearest known conservation area is Roy Hill Station, a proposed DEC managed ex-pastoral lease, located approximately 68 kilometres north of the application area (GIS Database). At this distance there is little likelihood of any impact to the conservation area from the proposed clearing.

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

Methodology

GIS Database:
- DEC Proposed 2015 Pastoral Lease Exclusions
- 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

According to available databases, the application area is located within the Newman Water Reserve Public Drinking Water Source Area (PDWSA) (GIS Database).

The Newman Water Reserve is currently classified as a Priority 1 (P1) Source Protection Area. Advice received from the Department of Water (DoW) states that mining is a conditional activity within P1 Source Protection Areas (DoW, 2007). BHPBIO is both the water service provider utilising this water source and also the applicant for this clearing permit. All activities associated with the clearing include infrastructure, laydown area, refuelling, and topsoil storage should be compatible with the Department of Water's Land Use Compatibility Tables (DoW, 2007).

DoW also stated that a number of bores are in or near the application area. The Newman Groundwater Licence Operating Strategy indicates bore V18 is a potable water supply bore close to the application area. It is DoW's policy position that a Wellhead Protection Zone (WHPZ) should be established around all water supply bores, including those within the Newman Water Reserve, to protect the water source from contamination. In P1 areas WHPZs extend to a 500 metre radius around the wellhead (DoW, 2007). Consequently, DoW does not support the clearing of any vegetation within 500 metres of bore V18 (DoW, 2007). Provided the clearing and associated activities are outside any WHPZs, follow best environmental practices and comply with the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 then the Water Source Protection Branch has no objection to the proposed clearing (DoW, 2007).

A map provided by BHPBIO illustrated the location of bore V18 in relation to the area applied to clear. Approximately 78 hectares of the application area falls within the 500 metre buffer zone around the bore. Bore V18 provides approximately 20% of its output to the township of Newman as one of its potable supply sources. The output from V18 is regularly analysed to ensure water of acceptable quality. The bore output is also protected by a number of smaller monitoring bores that provide advance warning should water quality be affected (BHPBIO, 2007). BHPBIO (2007) stated that it is BHP Billiton Iron Ore Pty Ltd's intention, if feasible, to avoid using the 78 hectare area around the V18 water bore for stockpiling of topsoil or borrow activities, however, if this is not possible BHPBIO will limit their footprint within the V18 buffer zone to 12 hectares for stockpiling purposes only (no borrow activities will occur). DoW (2007) confirmed that they approve with the outcomes discussed with BHPBIO.

The groundwater salinity within the application area is approximately 500-1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. Given the low rainfall to high evaporation rate, the proposed clearing of 135.84 hectares of native vegetation is not likely to significantly increase groundwater recharge which could otherwise lead to significant rises in ground water levels. The proposed clearing is not likely to cause deterioration in the quality of groundwater in the local area.

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

Methodology

BHPBIO (2007)
DoW (2007)
GIS Database:
- Groundwater Salinity, Statewide
- Public Drinking Water Source Areas

(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 experiences a tropical semi-desert climate (CALM, 2002). The average annual rainfall of the application area is approximately 400 millimetres, with the area experiences a mean annual evaporation of approximately 3,600 millimetres (GIS Database).

Given the low rainfall to high evaporation ratio of the application areas and considering the infrequency of significant rainfall events in the region (GIS Database), it would be expected that any normal rainfall would quickly evaporate or infiltrate the soil. The proposed clearing of 135.84 hectares within the application area is unlikely to cause or exacerbate flooding during normal rainfall events. It is considered that any localised flooding is only likely to occur as a result of any infrequent significant rainfall events.

Shepherd (2009) vegetation statistics indicate that approximately 99.89% of the pre-European vegetation extent remains within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) region. The proposed clearing of up to 135.84 hectares of native vegetation constitutes only a very small proportion of the size of the Upper Fortescue River catchment (less than approximately 0.005% of the total catchment area) which remains largely uncleared (GIS Database; Shepherd, 2009). Vegetation is considered an important ground cover as it slows surface water flows, and enables rainwater to infiltrate the soil to depths where it can be utilised by vegetation. Given that the Pilbara bioregion, as well as the surrounding regions, remain largely uncleared (Shepherd, 2009), the proposed clearing is not likely to impact significantly on the drainage characteristics of

the Upper Fortescue River catchment area.

There are no permanent watercourses within the application area (GIS Database). Whaleback Creek occurs within the application area, however part of the creek will be diverted and designed to withstand a one in 20 year ARI flooding event (BHPBIO, 2006a). BHP Billiton Iron Ore Pty Ltd have advised that additionally, drainage will be incorporated into the design with the use of culverts, rock mattresses, scour protection in batters and drains and concrete kurbing, and the construction of levee banks, perimeter flood levees, machine berms, sediment ponds and drains (to line and level) (BHPBIO, 2006a).

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

Methodology

BHPBIO (2006a)
CALM (2002)
Shepherd (2009)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments - Catchments
- Hydrography, Linear
- Rainfall, Mean Annual

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

Comments

There is one Native Title Claim (WC05/6) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are numerous registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal sites of significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

Clearing permit CPS 1565/1 was granted by the Department of Mines and Petroleum (DMP) on 2 June 2011, and was valid from 2 June 2011 to 18 March 2012. The clearing permit authorised the clearing of up to 135.84 hectares of native vegetation. An application for an amendment to clearing permit CPS 1565/1 was submitted to DMP on 3 October 2011. BHPBIO has applied to amend the purpose to mineral production and associated activities, extend the duration of the permit for an additional five years, and change the annual reporting date. The amount of clearing and the clearing area boundary that was approved under clearing permit CPS 1565/1 will remain unchanged.

Methodology

GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims – Registered with the NNTT

4. References

BHPBIO (2006a) Newman Hub Expansion Works: Vegetation Clearing Permit Supporting Documentation September 2006. BHP Billiton Iron Ore Pty Ltd, Western Australia.

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Ecologia Environment (2004) BHP Billiton Ongoing Works: Newman Hub. Final Report, August 2004. Ecologia Environment. Prepared for BHPBIO.
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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), 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 (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.