Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1210/1

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Pilbara Manganese Pty Ltd**

1.3. Property details

Property: M45/429

Local Government Area: Shire Of East Pilbara

Colloquial name: Radio Hill North Open Pit

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
The area is broadly mapped as Beard Vegetation Association 173: Hummock Grasslands, shrub steppe, Kanji over soft spinifex and *T wiseana* on basalt. The vegetation of the areas proposed to be cleared was surveyed and mapped in more detail at a scale of 1:14000 by MBS Environmental over 6 days in July 2005 (MBS 2005). The vegetation was classified by MBS Environmental into five landscape units. Description of these units are as follows: Alluvial plain: *Triodia longiceps* hummock grasslands and *Cenchrus ciliaris* grassland closer to drainage lines. *Triodia basedowii* dominates on higher and rocky ground. Occasional *Corymbia opaca* occur as the overstorey species. Occasional mid-storey species include *Indigofera monophylla*, *Atalaya hemiglauca*, *Hakea lorea*, and *Gossypium australe*. Occasional understorey species include *Senna artemisiodes* subsp. *oligophylla* and *Acacia synchronicia*. Colluvial Plain: *Triodia basedowii* hummock grassland with *T longiceps* dominant in the lower lying areas where water is likely to pool.	The purpose permit is for the clearing of 18.5 hectares of native vegetation within a permit area of 23 hectares for the purpose of mineral production. The activities proposed will involve the expansion of the existing Radio Hill open pit by mining the Radio Hill North deposit.	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994) to Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	There have been a number of flora surveys conducted over the Woodie Woodie tenements. A biological survey (flora and fauna) of the nearby Mike Project area was undertaken in July 1994 by Mattiske Consulting Pty Ltd. This survey covered an area that is substantially larger than the project area and included a number of landforms that are not part of the current proposal (MBS, 2006). MBS Environmental completed a vegetation and habitat assessment of the project area in July 2005. Quadrats were established in each landform type and the flora within each quadrat was recorded. The condition of the vegetation throughout the survey area was described by MBS Environmental and varied from degraded to very good using the Keighery (1994) scale. Evidence of disturbance was largely associated with areas that had been subject to mineral exploration and previous mining activities (MBS, 2006). The Radio Hill deposit was mined and dewatered in the 1970s. Mining of the Radio Hill South pit commenced in August 2004 and is continuing to date.

Occasional overstorey species include *Corymbia hamersleyana* and *Acacia coriacea* subsp. *sericophylla*. Occasional midstorey species include *Acacia marramamba*, *A bivenosa*, *A arida*, *A trachycarpa*, *Anthobolus leptomerioides*, *Carissa spinarum* and *Senna glutinossa* subsp. *x luersenii*.

Minor Drainage :

Acacia shrublands (Species include *Acacia arida*, *A acradenia*, *A marramamba* and *A cuthbertsonii*) over a dense *Cenchrus ciliaris* understorey. Occasional overstorey species include *Acacia tumida*, *Attalaya hemiglauca*, *Corymbia hamersleyana* and *Hakea lorea*. Occasional midstorey species include *Acacia bivenosa*, *A trachycarpa*, *A rhodophloia*, *A inaquilatera*, *A coriacea* subsp. *Sericophylla*, *Grevillea wickhamii*, *Tephrosia rosea* var. *clementii*, *Trichodesma zeylanicum*, *Gossypium australe*, *Senna glutinosa* subsp. *X luerssenii*, *Attalaya hemiglauca*, *Fluerggea virosa* subsp. *Melanthesoides*, *Carissa spinarum* and *Anthobolus leptomerioides*. Occasional understorey species include *Cymbopogon procerus*, *Rhynchosia minima*, *Triodia longiceps*, *T pungens*, *T basedowii*, *Corchorus laniflorus*, *Cleome viscose*, *Tephrosia rosea* var. *clementii*, *Citrullus colocynthis*, *Senna glutinossa* subsp *glutinosa*, *Truimfetta chaetocarpa*, *Achyranthes aspera*, *Euphorbia australis*, *Ipomea calabris, I muelleri*, *Cullen* sp., *Gossypium australe*, *Pterocaulon serrulatum* and *Solanum phlomoides*.

Rocky Slopes and Rises:

Triodia basedowii hummock grassland. Occasional overstorey species include *Eucalyptus leucophloia*, *Hakea lorea* and *Corymbia aspera*. Occasional midstorey species include *Acacia arida*, *Senna glutinosa* subsp. *glutinosa*, *Flueggea virosa* subsp. *melanthesoides* and *Atalaya hemiglauca*. Occasional understorey species include *Solanum phlomoides*, *S. gabrielae*, *Truimfetta chaetocarpa*, *Gossypium australe*, *Mukia* sp., *Cymbopogon procerus*, *Enneapogon caerulenscens* and *Heliotropium murinum*. *Senna notablis* was also present in disturbed areas of this landscape.

Mining Related Disturbance:

Around the Radio Hill project area, this landscape unit is restricted to the existing pits, waste dumps, and haul roads.

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 area proposed to be cleared is situated within the Chichester subregion of the Pilbara IBRA (Interim Biogeographical Regionalisation of Australia) region (GIS Database). Kendrick and McKenzie (2001) noted high small mammal and reptile species diversity within hummock grassland communities.

The vegetation communities of the region consist of components of the Fortescue Botanical District and the Canning Botanical District and are primarily hummock grasslands of Spinifex (Triodia sp.) and shrub and tree steppe communities (Beard, 1975). The vegetation and habitats present within the project area are well represented on a regional scale, and there is no evidence available from the information gained by the MBS vegetation and habitat assessment to suggest that the reptile or small mammal communities within the areas proposed to be cleared are likely to be of greater diversity than that of similar habitat in the local area or bioregion.

The condition of the vegetation throughout the survey area varied from very degraded to very good (MBS, 2005). Evidence of disturbance is largely associated with areas that had been subject to mineral exploration as well as previous and existing mining activities. Previous mining activity has disturbed approximately thirty percent of the area proposed to be cleared (MBS, 2006). The vegetation and landscape units mapped within the Radio Hill project area are well represented throughout the region and are therefore not thought to be regionally or locally significant. Department of Environment and Conservation (DEC) Biodiversity Coordination Section (BCS) advice received on the 10th of October stated that the information contained within the

supporting documentation provides insufficient evidence to conclude that the notified area comprises a higher level of biological diversity than surrounding areas (DEC, 2006a).

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology

Beard (1975).
DEC (2006a).
GIS Database:
Clearing Regulations - Environmentally Sensitive Areas - DoE 30/05/05.
Clearing Regulations - Schedule One Areas - DoE 10/03/05.
IBRA Subregions - EA 18/10/2000.
Pre-European Vegetation - DA 01/01.
Kendrick and McKenzie (2001).
MBS (2006).

(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 habitat assessment of the Radio Hill and Greensnake project areas was carried out in conjunction with the vegetation survey conducted by MBS Environmental in 2005. MBS (2005) identified five primary fauna habitats at a landscape level within the Radio Hill North project area: Rocky hills; Acacia dominated minor drainage lines; Triodia hummock grassland dominated plains; Low gorges to the north-west of the Radio Hill project area; and Small caves in the walls of the low gorges. Each of these major habitat types were visited during the 2005 site inspection. One frog, no reptile, 17 bird and six mammal species were observed during the survey. A total of 113 fauna species are expected to occur in the Woodie Woodie area (MBS, 2005).

There is the potential for a number of fauna species of conservation significance to occur within the area applied to clear. Searches of the CALM database and the *Environmental Protection and Biodiversity Conservation Act 1999* database for species of conservation significance that may occur in the region listed six mammals, twelve birds, and two reptiles (MBS, 2005). In addition to these searches, other references indicate that two Priority 4 species, Long-tailed Dunnart (*Sminthopsis longicaudata*) and Lakeland Downs Mouse (*Leggadina lakedownensis*), may also occur in the region (MBS, 2005). The Lakeland Downs Mouse, Long Tailed Dunnart, and Ghost Bat, *Macroderma gigas* (P4), were all judged unlikely to occur in the areas proposed to be cleared based on their known range and/or lack of suitable habitat (MBS, 2005).

Seven of the bird species are protected under international migratory agreements (CAMBA, JAMBA, Bonn Convention) and are listed as likely to be overfly and occasional visitors, rather than using the habitats of the project area regularly (MBS, 2006). The proposed clearing is unlikely to impact critical feeding or breeding habitat for any migratory species.

Based on their known range, records and habitat requirements, MBS Environmental considered that the likelihood of the Great Desert Skink *Egernia kintorei* (VU), Pilbara Olive Python *Liasis olivaceus barroni* (VU), Pilbara Leaf Nosed Bat *Rhinonicteris aurantius* (VU), Night Parrot *Pezoporus occidentalis* (S1), and the Northern Marsupial Mole *Notoryctes caurinus* (S1), occurring within the proposed clearing areas to be low.

The Princess Parrot *Polytelis alexandrae* (VU) may occur in the area based on its known distribution (MBS 2005). Swales between sand dunes are the preferred habitat of the Princess Parrot and nests have been recorded in hollows of River Red Gum (*Eucalyptus camaldulensis*) and Desert Oak (*Allocasuarina decaisneana*) (Higgins, 1999). It is possible that the Princess Parrot may sporadically inhabit the Woodie Woodie area in particular the creek line habitat with the River Red Gum. However sand dune habitats and River Red Gum are absent from the area applied to clear, thus reducing the likelihood of the Princess Parrot inhabiting the Radio Hill project area.

Extensive areas of Triodia hummock grassland occur across the project area and may provide habitat for species such as the Australian Bustard *Ardeotis australis* (P4), Mulgara *Dasycercus cristicauda* (S1), Bilby *Macrotis lagotis* (S1), and Western Pebble-Mound Mouse *Pseudomys chapmani* (P4). The Western Pebble-Mound Mouse has been recorded on several occasions within the Woodie Woodie area (Martinick McNulty, 2001), however no mounds were observed during the 2005 survey. A targeted survey was carried out by Western Wildlife for the Mulgara, Western Pebble-Mound Mouse and Bilby at the Woodie Woodie site on the Greensnake prospect area (10 kilometres south of Radio Hill) between the 3rd and 7th of May 2006. Western Wildlife (2006) indicated that although the Radio Hill prospect was indicated in the scope of the works, it was established that mining activities had already commenced and it was not possible to gain access to the area for safety reasons. A total of 26 pebble mounds were found at Greensnake, however none seemed to have been active in recent times (Western Wildlife, 2006). It is likely that this species occurs on suitable rocky hillslopes in the Radio Hill application area, however it is unknown whether mounds there are active or not (Western Wildlife, 2006). Western Wildlife (2006) indicated that the apparent recent local extinction of the Pebble-Mound Mouse in areas away from current mining activities is of concern and may indicate the impacts of frequent fires or high levels of predation by cats.

Both the Mulgara and Bilby prefer sandy soils, usually on plains or dune valleys, whereas the majority of the area applied to clear is hilly with hard and stony soils (Western Wildlife, 2006). Western Wildlife found no evidence of the Mulgara at Greensnake and found it unlikely that suitable habitats are present in the Radio Hill application area, although this is not possible to say with certainty. Previous studies have suggested that the Bilby may be present in a drainage line to the west of the nearby Mike deposit (18 km south of Radio Hill) (Mattiske 1994, referenced in Martinick McNulty, 2001) however the Western Wildlife fauna assessment found no evidence of Bilbies at Greensnake. The Bilby are more versatile in their habitat preferences but still prefer sandy habitats, therefore Western Wildlife stated that they are unlikely to occur within the Radio Hill application area. Given the above it is unlikely that the proposed area to clear will result in the loss of significant habitat to Mulgara, Greater Bilbies, or the Western Pebble-Mound Mouse.

The Australian Bustard *Ardeotis australis* and the Rainbow Bee-eater *Merops ornatus* (JAMBA) were recorded within the Radio Hill project area and are commonly observed in the Woodie Woodie area (MBS, 2006). The Peregrine Falcon, Falco peregrinus (S4) and Bush Stone Curlew *Burhinus grallarius* (P4) are wide ranging species that may occur occasionally within the proposed clearing area. The habitats of all of those four species are represented widely on a regional scale; therefore the proposed clearing is not expected to adversely impact on the conservation status of these species.

MBS Environmental (2005) state that during dewatering of the proposed pit, water will flow into the Oakover River. The presence of water in these usually ephemeral creeks may potentially provide additional habitat and food source for some fauna species. However, this will be a temporary impact and is unlikely to affect the conservation of fauna species. The vegetation and habitats present within the Radio Hill project area are well represented on a regional scale. While the proposal is likely to have local impacts from loss and fragmentation of habitat, it is unlikely that the loss would impact on the conservation status of fauna species of conservation significance given that large area of similar vegetation types remain locally. Advice received from DEC (2006a) state that there is potential for several fauna species of conservation significance to occur within the area applied to clear, however given the information provided and the availability of similar habitat in the area, it appeared unlikely that the area proposed to be cleared consists of significant habitat for fauna.

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology

DEC (2006a).
GIS Database: CALM Threatened Fauna - CALM (30/09/2005).
Higgins (1999).
Martinick McNulty (2001).
MBS (2005).
MBS (2006).
Western Wildlife (2006).

(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

A vegetation survey of the Radio Hill and Greensnake project areas was conducted between July 4 and July 9 2005 by two staff of MBS Environmental (MBS, 2006). No Declared Rare Flora (DRF) species and two Priority species were identified, from CALM searches for species of conservation significance, as potentially occurring in the Woodie Woodie survey area; *Lepidium amelum* (P1) and *Dampiera atriplicina* (P2) (MBS, 2006). No DRF or Priority flora species were recorded during the survey (MBS, 2005).

The habitat of the *Lepidium amelum* is generally low, undulating calcrete plains, a habitat that is not commonly found in the Radio Hill North project area (MBS, 2006). MBS Environmental stated that given that *Lepidium amelum* grows between 0.3 and one metre in height, and was expected to flower at the time of the survey it is likely that it would have been recorded if present within the area applied to clear (MBS, 2006). The preferred habitat of *Dampiera atriplicina* is red sand and sandy ridges (MBS, 2006). As this habitat is not present within the project area it is unlikely to be found within the area proposed to clear.

Given the lack of evidence of *Lepidium amelum* occurring in the area surveyed and lack of favourable habitat for *Dampiera atriplicina*, it is unlikely that the vegetation proposed to be cleared is necessary for the in situ existence of DRF or Priority flora. DEC (2006a) recommends that if Priority flora are identified, the proponent ensures that disturbance and impacts are avoided.

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology

DEC (2006a).
GIS Database:
Declared Rare and Priority List - CALM 01/07/05.
Pre-European Vegetation - DA 01/01.
MBS (2005).
MBS (2006).

(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) within the area applied to clear (GIS Database) or surrounding IBRA subregion (Kendrick and McKenzie, 2001). DECýs TEC dataset shows the closest TEC to be Mandora Mounds which is 200 kilometres north of the area applied to clear. MBS (2006) state that the vegetation found in the project area is well represented in surrounding areas and in the East Pilbara region as a whole.

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology

DEC (2006a).
GIS Database: Threatened Ecological Communitites - CALM 12/4/2005
Kendrick and McKenzie (2001).
MBS (2006).

(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 IBRA Bioregion and the Shire of East Pilbara (GIS Database). Shepherd et al. (2001) report that approximately 99.9 % of the Pre-European vegetation still exists in the IBRA Pilbara Bioregion, with approximately 6.3% in reserves. The vegetation in the application area is recorded as Beard Vegetation Association 173: Hummock grasslands, shrub steppe, Kanji over soft spinifex and *T wiseana* on basalt. According to Shepherd et al. (2001) approximately 100% of this vegetation association remain.

	Pre-European area (ha)	Current extent (ha)	Remaining %*	Conservation Status**	% in IUCN Class I-IV reserves
IBRA Bioregion - Pilbara	17,804,163*	17,794,650*	99.9%	Least concern	6.3%
Shire of East Pilbara	No information available				
Beard vegetation associations - 173	1,753,116	1,753,116	~100%	Least concern	13.6%

* Shepherd et al. (2001)
** Department of Natural Resources and Environment (2002)

In consideration of the above, the proposed clearing area does not represent a significant remnant of native vegetation. The proposal is not at variance to this principle.

Methodology

Department of Natural Resources and Environment (2002).
GIS Database:
IBRA Subregions - EA 18/10/2000.
Pre-European Vegetation - DA 01/01
Shepherd et al. (2001).

(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 not likely to be at variance to this Principle

The area applied to clear is within an arid environment with no permanent watercourses or wetlands. The geomorphology of the Radio Hill project area includes rounded hills on an undulating plain with weakly incised drainage systems that flow west and south-westwards in Muddauthera Creek into Cracker Creek, which eventually drains into Oakover River. Flow in the creeks is ephemeral and there are no permanent pools or water holes within the area applied to clear (MBS, 2006).

Approximately one hectare of the vegetation type labelled Minor Drainage comprising of Acacia shrubland over a dense Buffel grass understorey will potentially by affected by the proposal. Consolidated Minerals (2006) confirmed with DoIR that the creekline is highly degraded, that it does not retain any functioning riparian vegetation and has significant coverage of introduced Buffel grass. Furthermore, the vegetation of this site is common in similar situations across the tenements. There have been diversion of drainage lines in the past (Lewis Pit, Chris D Pit) and when mining and dewatering cease and the drainage is re-established the vegetation recovers within a season (without seeding or intervention) (Consolidated Minerals, 2006). The clearing of vegetation along the minor drainage lines is unlikely to be of environmental significance given the degraded nature of the vegetation and that such vegetation type is common in the local area.

Dewatering of the proposed expanded open pit is required, with water discharged to the local creek system.

There is an extensive history of dewatering discharge to local creeks at Woodie Woodie. Monitoring of these activities has not identified any long-term impacts (MBS, 2006). Discharge of mine waters from the Radio Hill North open pit will be carried out within the guidelines established in the Consolidated Minerals Environmental Management Plan 1998. Dewatering discharges are monitored and reported in accordance with existing Environmental Licence requirements.

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology Consolidated Minerals (2006).
GIS Database:
Linear Hydrography - DoE 13/04/2005.
Topographic Contours, Statewide - DPLA 12/09/02.
MBS (2006).

(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

According to the Technical Bulletin 92: An Inventory and Condition Survey of the Pilbara Region, Western Australia (2004), the land to be cleared is mapped to be on the Coongimah land system (GIS Database). However DAFWA (2006) suggest that the area to be cleared is McKay land system, after an interpretation of the MBS Environmental report descriptions and an interpretation of satellite imagery. The McKay land system is described as hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks that support hard spinifex on red loam and duplex soils usually protected by stone mantles (DAFWA, 2006).

Advice received on the 12 July 2006 from the Office of the Commissioner of Soil and Land Conservation (DAFWA, 2006) in relation to this permit application stated:

"These soils are liable to erode if cleared, the protective stone mantle or surface water flow regimes altered." Therefore DAFWA (2006) concluded that the proposed clearing may be at variance with principle (g) for soil erosion.

The open pit is a permanent void in the landscape however rehabilitation of the waste dump will be implemented and all other areas of land clearing will be progressively rehabilitated with local provenance species on the completion of mining activities (MBS, 2006). Minimisation of land degradation issues will be achieved by applying best practice clearing and rehabilitation methods (MBS, 2006). To achieve this, Pilbara Manganese are committed to adhering to the following management strategies: minimising the area requiring vegetation removal; confining vehicle movements to defined haul roads and tracks; conducting topsoil-stripping activities during periods of low winds; establishing vegetation on bare surfaces on completion of mining activities; stockpiling topsoil for the use in rehabilitation; and storing hydrocarbons and refuelling in bunded areas (MBS, 2006).

Two weed species, *Cenchrus ciliaris* (Buffel Grass) and *Citrullus colocynthis*, were recorded during the MBS (2005) vegetation and habitat survey. These species are likely to have originated from pastoral land use in the region. The species *Acetosa vesicaria* (Ruby Dock) is also known to occur, mainly on disturbed ground associated with mining infrastructure (MBS, 2006). A weed management program is currently undertaken on site to control infestations of Ruby Dock.

During the mining operation dust suppression measures are undertaken. MBS (2006) advise that the proposed dewatering of the open pit will decrease the water table. However, monitoring of previous open pit operations shows rapid recovery of the water table to pre-mining levels at the conclusion of mining (MBS, 2006). The water quality in the project area generally complies with ANZECC (1992) guidelines for aquatic ecosystems (freshwater) (MBS, 2006). The water table in the area is sufficiently deep enough that clearing of vegetation will not cause a major risk in the water table to result in soil salinity. An extensive network of monitoring sites is located around the mine site which is reported biannually to the DEC as part of the Environmental Licence. MBS (2006) advise that no broader land degradation as a result of mining activities has been identified through this monitoring program.

Provided appropriate erosion control measures are implemented, the proposed clearing is not likely to cause appreciable land degradation.

Given that there is the risk of soil erosion from the clearing of the protective stone mantle or altering of surface water flow regimes, the proposal may be at variance to this principle.

Methodology DAFWA (2006).
GIS Database:
Hydrography, linear - DoE 01/02/04.
Rangeland Land System Mapping - DA
Soils, Statewide, DA 11/99.
Topographic Contours, Statewide - DPLA 12/09/02.

MBS (2005).
MBS (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

The nearest area of conservation significance is Carawine Gorge listed as a wetland of subregional significance in CALM's assessment of the biodiversity values of the Pilbara 1 IBRA subregion (Kendrick and McKenzie, 2001). Carawine Gorge is located approximately 14 kilometres downstream from the proposed area to clear therefore direct impacts associated with the clearing of native vegetation are not likely to impact its conservation status (DEC, 2006a).

While outside of the scope of the environmental impacts resulting from the clearing of vegetation, the planned increase in dewatering flows as a result of the pit expansions planned, may impact the environmental values of Carawine Gorge. Such impacts have already been listed as threatening processes to Carawine Gorge in Kendrick and McKenzie (2001) and are already monitored under provisions of an EP licence granted to Pilbara Manganese. DEC in their advice received on the 10th October 2006 have stated that the indirect impact associated with the dewatering of the proposed pit extension do need to be addressed and that DEC would like to have the opportunity to review and provide comment on these issues (DEC 2006a).

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology

DEC (2006a).
GIS Database: CALM managed Lands and water - CALM 1/07/05.
Kendrick and McKenzie (2001).

(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 area proposed to clear is not located within a Public Drinking Water Supply Area (PDWSA) (GIS Database).

The groundwater and surface water quality of the Woodie Woodie region is well documented, with over ten years of monitoring data from bores, discharge water, and upstream and downstream surface water flow in creeks and rivers (MBS, 2006). The natural water table is more than 20 metres below ground level. Groundwater recharge is by rainwater infiltration through the overlying unsaturated rocks and sediments. Recharge has been estimated using a combination of methods to be about 15% of annual rainfall. The quality of groundwater (fresh to brackish) is indicative of the basin receiving rapid recharge from infiltrating rainwater (MBS, 2006).

The geomorphology of the Radio Hill North project area includes rounded hills on an undulating plain with weakly incised drainage systems that flow west and south-westwards in Muddauthera Creek into Cracker Creek, which eventually drains into the Oakover River, which further downstream becomes the De Grey River. Flow in the creeks is ephemeral and there are no nearby permanent pools or water holes (MBS, 2006). Dewatering of the expanded open pit is required; the water will be discharged into Muddauthera Creek. Water will first be pumped into a settling pond system that has been designed to provide time for any solids to settle so that clean water is discharged into the creek system (MBS, 2006).

Open pit groundwater levels have in the past recovered quickly to pre-mining levels at the cessation of dewatering operations (MBS, 2006). Both quality and quantity criteria for discharge water is included in the Woodie Woodie Operations Environmental Licence 6131/9 requirements, issued by DEC, which contains monthly water quality and discharge requirements. No significant adverse effects have been recorded from these previous operations. MBS (2006) anticipate the current project will have similar impacts to previous projects.

The clearing of the native vegetation itself is unlikely to contribute significantly to changes in surface or groundwater quality compared to the potential impacts of the dewatering of the expanded pit.

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology

GIS Database:
Groundwater provinces - WRC 98.
Groundwater Salinity, Statewide - 22/02/00.
Hydrography, linear - DoE 01/02/04.
Public Drinking Water Source Areas (PDWSAs) - DoE 28/04/05.
Topographic Contours, Statewide - DOLA 12/09/02.
MBS (2006).

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments

Proposal is not likely to be at variance to this Principle

The proposed clearing area is situated within the east Pilbara region (GIS Database). The east Pilbara experiences an arid climate, characterised by high temperatures, high evaporation, and high intensity rainfall events associated with thunderstorms and cyclones. For the majority of the year, the creek systems are dry (MBS, 2006).

The clearing of 18.5 hectares is unlikely to lead to an increase in peak flood height or duration. Furthermore any such increase would be insignificant in comparison to the dewatering flows expected from the proposed project.

In consideration of the above, the proposal is judged to not likely be at variance to this principle.

Methodology

MBS (2006).
GIS Database:
Evaporation Isopleths - BOM (09/1998).
Mean annual rainfall surface (1975-2003) - DoE 09/05.
Topographic Contours, Statewide - DOLA 12/09/02.

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

Comments

There is one native title claim over the area under application; WC99_008. This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenement M45/429 has 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 the clearing permit is not a future act under the *Native Title Act 1993*.

No known sites of Aboriginal significance are located within the clearing permit area (GIS Database).

Pilbara Manganese Pty Ltd Radio Hill M45/429 has three current groundwater licences GWL90519(4), GWL150949(2), GWL65080(3) valid until 31 December 2008 for the purposes of mineral ore processing, mining camp, dewatering for mining, dust suppression, and rehabilitation purposes, granted in accordance with the *Rights in Water and Irrigation Act 1914*. The licences will not need to be amended to take into account the clearing application (DEC, 2006b).

DEC (2006b) advice received in relation to this proposal stated that:

When the water licences were issued on the 2 March 2006 it was noted that Woodie Woodie Operations have drawn only 20% of their allocation and that Pilbara Manganese wishes to retain the allocation for the coming years, as the allocation will be required for the dewatering campaign at the new Greensnake pit.

Pilbara Manganese Pty Ltd Radio Hill M45/429 has a current operating licence 6131/9 granted in accordance with the *Environmental Protection Act 1986*. The proposed clearing is not at variance to this licence, and no amendment to the licence will be required for the expansion of the existing Radio Hill open pit north deposit (DEC, 2006b).

Methodology

DEC (2006b)
GIS Database:
Aboriginal Sites of Significance - DIA 04/07/02
Native Title Claims - DLI 19/12/04

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mineral Production	Mechanical Removal	18.5	**Grant**	The proposal has been assessed against the clearing principles and judged not at variance to principle e, and unlikely to be at variance for principles a,b,c,d,f,h,i and j. The proposed clearing may be at variance with principle g, as DAFWA advised that the soils within the area to be cleared are liable to erode if cleared, the protective stone mantle or surface water flow regimes altered. Pilbara Manganese have developed a list of management strategies to reduce the risk of land degradation occurring as a result of the proposed clearing. Due to the nature of the clearing, and given best practice clearing and rehabilitation methods are undertaken, the assessing officer believes that the impacts are likely to be minimal. The assessing officer recommends that the permit be granted with the following conditions: 1. The Permit Holder shall record the following for each instance of clearing: a) the location where the clearing occurred, expressed as grid coordinates using the Geocentric Datum of Australia 1994 coordinate system; b) the size of the area cleared in hectares; c) the dates on which the area was cleared. 2. The Permit Holder shall provide a report to the Director, Environment, Department of Industry and Resources each year for the life of this permit setting out the records required under condition 1 of this permit in relation to clearing carried out in the previous year. This report can be included as an addendum to the Annual Environmental Report required under the Mining Act 1978.

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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.
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.
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.