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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1662/2
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Iluka Resources Limited**

1.3. Property details

Property: *Mineral Sands* (*Eneabba*) *Agreement Act 1975*, Mining Lease 267SA (AM 70/267)
Local Government Area: Shire of Carnamah
Colloquial name: Eneabba Operations – Mulch Harvesting

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
150		Mechanical Removal	Mulching vegetation as part of minesite rehabilitation process

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
Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia, and are useful to look at vegetation extent in a regional context. The Beard vegetation association located within the areas proposed to be cleared is: 379: Shrublands; scrub-heath on lateritic Sandplain in the central Geraldton Sandplain Region (GIS Database). Woodman Environmental Consulting (2006) recorded seven vegetation community types in the proposed clearing area: S1: Tall shrubland dominated by *Xylomelum augustifolium* on ridges on grey sand. S14: Low shrubland, with occasional emergent *Eucalyptus todtiana* and *Eucalyptus pleurocarpa*, on grey sand. SH5: Low heath dominated by *Dryandra* spp. on grey sand. SH 7: Low heath dominated by *Ecdeiocolea monostachya* and *Xanthorrhoea preissii* on grey sand. W7: Open low woodland of *Banksia menzieszii*, *Banksia attenuata* and *Banksia candolleana* on grey sand. W8: Very open low woodland of *Eucalyptus todtiana* and *Eucalyptus pleurocarpa* over low shrubs on grey sand. W10: Open low woodland of *Eucalyptus pleurocarpa* over low shrubs dominated by *Eremaea beaufortioides* var. *beaufortioides*, *Ecdeiocolea monostachya* and *Daviesia nudiflora* on grey sand.	Iluka Resources Limited (from now on referred to as Iluka Resources) has applied to clear 150 hectares of native vegetation within a total area of 474 hectares to be turned into mulch, for use in the rehabilitation of previously mined areas. The two proposed clearing areas are located approximately 280 kilometres north of Perth, adjacent to the Brand Highway. Harvesting for mulch at Eneabba is undertaken using a Gallagher Silage Harvester feeding into a 'Krone' Manure Spreader. Harvested mulch is immediately transported and spread onto rehabilitation areas. Low to medium height vegetation is harvested in this manner, with tall heath, emergent shrubs and trees bypassed (Iluka Resources, 2006). Harvested blade heights are set to about 30 centimetres above ground and blades are regularly sharpened to ensure the vegetation is cut cleanly with as little crushing and bruising as possible (Iluka Resources, 2006). Harvesting works are proposed to be undertaken predominantly from January to May.	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994). To Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994)	Woodman Environmental Consulting (2006) described the vegetation condition (based on the Keighery 1994 scale) in the areas proposed to be cleared as Very Good to Excellent. No evidence of dieback affected vegetation occurs within or adjacent to the proposed clearing area. The nearest dieback affected site is located approximately 600 metres southwest of the proposed clearing area. Iluka Resources has a dieback management plan in place and is currently in the process of amending that plan following recent Department of Environment and Conservation (DEC) comments. Iluka Resources has requested an amendment to Clearing Permit CPS 1662/1 (granted on 16 June 2007) for an extension of the expiry date from 29 Janurary 2010 to 15 March 2012. No further assessment against the 10 Clearing Principles is required to undertake this amendment.

The predominant vegetation communities in the areas proposed to be cleared are S14 and W10.

3. Assessment of application against clearing principles

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

Comments

Proposal may be at variance to this Principle

The proposed application area is for the mulching of native vegetation, which involves the cutting of vegetation to 30 centimetres above ground level and leaving the plants root system in place (Iluka Resources, 2006). The mulched vegetation is then immediately used to cover recently reinstated areas, which is an important component of the native vegetation rehabilitation process carried out on site (Iluka Resources, 2006).

The application areas are located in the Lesueur Sandplain GS3 Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS Database). The biodiversity values of that subregion have been summarised by Desmond and Chant (2001). The area exhibits extremely high floristic endemism, with over 250 species of sandplain flora endemic to the subregion. The Lesueur Sandplain subregion is known Australia wide and internationally for its high floristic diversity and levels of endemism (Desmond and Chant, 2001).

A Vegetation Survey for the Adamson area (an Iluka Resources minesite adjacent to the application area) was conducted in 2005, covering 846 hectares, which encompassed the current application areas. It was found that a total of 206 plant species belonging to 31 plant families occurred within the survey area (Woodman Environmental Consulting, 2005). Fifteen separate plant communities were mapped for the Adamson area, seven of which occur within the current application areas (Woodman Environmental Consulting, 2005). During the 2005 survey, no Declared Rare Flora (DRF) plant species were recorded within the proposal area, however, 13 Priority flora species were recorded.

Twelve DRF species have previously been recorded in the Eneabba region (GIS Database; Woodman Environmental Consulting, 2005), and twenty-five Priority species within ten kilometres of the mulching area (GIS Database). This suggests the vegetation within the application areas and immediate surrounds is important for the maintenance of DRF and Priority species.

From previous studies and known records, 30 species of vertebrates of conservation significance may occur in the Eneabba area. This includes two reptiles, twenty-seven birds and a mammal species (Bamford and Bancroft, 2006).

The application areas will be surveyed for DRF prior to conducting harvesting activities (Iluka Resources, 2006). Any DRF located during the surveys will be marked in the field as required by Eneabba site protocol, entered into the Iluka GIS and a fifty metre buffer distance maintained.

Although there is an initial loss of vegetation after mulching, surveys carried out in 2005 for areas previously mulched in 2002 at the Eneabba site have shown that mulching has been found to:

- Result in a decrease in plant density followed by an increase by Year 3 to levels greater than prior to mulching.
- Result in a significant decrease in live foliage cover, followed by a gradual increase. Heath communities appear to recover foliage faster than woodland communities.
- Result in a decrease in species richness followed by an increase by Year 3 to numbers similar to or greater than recorded prior to mulching.
- Does not result in significant changes to the composition of plant communities, with all of the dominant species recovering from the mulching operations. All of the species that have not been recorded since mulching occurred were only present in very low densities (Woodman Environmental Consulting, 2005).

Therefore, it is acknowledged that there is a high level of speciation and endemism within the vegetation proposed to be cleared. Following clearing, these values will be diminished in the short-term. However, Woodman Environmental Consulting's research has shown that there is likely to be no net loss of biodiversity in the long-term and in fact, species diversity may increase temporarily before the vegetation returns to a more mature state.

Based on the above, the proposal may be at variance to this principle.

Methodology

Bamford and Bancroft (2006)
Desmond and Chant (2001)
Iluka Resources Ltd (2006)
Woodman Environmental Consulting (2005)
GIS Database:
IBRA (subregions) EA 18/10/00
Declared Rare and Priority Flora List - CALM 01/07/05

(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 review of the fauna information that has been gained from previous studies at Iluka's operations at Eneabba was undertaken in 2005 (Bamford and Bancroft, 2006). This review included a one day site inspection which occurred in October 2005. Trapping and surveys for vertebrate species have occurred at Eneabba since 1981, and studies focussing on invertebrates as an indicator of rehabilitation success since 1980. The Eneabba area has a long history of fauna investigations and the vertebrate fauna of the area has been well documented from various studies carried out as part of Iluka's operations or environmental approval requirements (Bamford and Bancroft, 2006). Similarly the studies of the invertebrate fauna in the area are among the most extensive in Western Australia.

From previous studies and known records of fauna of conservation significance, 30 species of vertebrates that are of conservation significance may occur in the Eneabba area. This includes two reptiles, twenty-seven birds and one mammal species. Many of the 30 species of fauna are unlikely to be present or only present as vagrants across the Eneabba area and are not expected to be reliant on the application areas. Eight of the conservation significant birds are waterbirds, and given the lack of wetland or aquatic habitats within the application area, it is unlikely that the proposal will significantly impact these species.

Conservation significant bird species that may be impacted by the proposed clearing are: the Carnaby's Black Cockatoo; the Peregrine Falcon; the Rainbow Bee-eater and the Fork-tailed Swift. In addition, there have been three Specially Protected and/or Priority fauna species recorded within ten kilometres of the proposed clearing area (Iluka Resources, 2006). These are the Shield-Backed Trapdoor Spider, the Scorpion Fly, and the Rufous Fieldwren (western wheatbelt).

The Carnaby's Black Cockatoo *Calyptorhynchus latirostris* (Schedule 1, fauna that is rare or likely to become extinct, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2006*) has been recorded in the vicinity of the proposal area (Iluka Resources, 2006; WA Museum, 2003). Bamford and Bancroft (2006) have stated that there appears to be no suitable breeding habitat either on the Iluka leases or sufficiently close for the breeding birds to rely on the lease for foraging. There are large areas of suitable foraging habitat in the local area and it is unlikely that the application areas would significantly impact the species conservation. Although the species may at times forage within the application areas, the food source will regenerate and it is expected that the clearing will not result in a long-term loss of foraging habitat.

The Peregrine Falcon *Falco peregrinus* (Schedule 4, other specially protected fauna, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2006*), may occur sporadically in the vicinity of the Eneabba mine, but is unlikely to be solely reliant on the proposed clearing areas (Iluka Resource, 2006). The species is a wide ranging bird, has little habitat specificity apart from an affinity with cliffs, tall trees for nesting and water (Pizzey and Knight, 1997). Given the lack of cliffs, tall trees or perennial watercourses within the project area, the proposal is unlikely to affect this species.

The Rainbow Bee-eater *Merops ornatus* (JAMBA, CAMBA, the Bonn Convention, and Schedule 3, Birds protected under an international agreement, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice, 2006*) is a common breeding resident in northern Australia and a summer breeding migrant to southeast and southwest Australia (Pizzey and Knight, 1997). The Rainbow Bee-eater is an opportunistic species known to inhabit a wide range of habitats, where it prefers to nest in sandy ground, banks and cuttings (Pizzey and Knight, 1997; Iluka Resources, 2006). The species is an aerial feeder and is not likely to be directly impacted and may in fact breed more in the harvested areas (Bamford and Bancroft, 2006).

The Fork-tailed Swift *Apus pacificus* (JAMBA, CAMBA, the Bonn Convention, and Schedule 3, Birds protected under an international agreement, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2006*) is reported to roost on cliffs and large trees, but it prefers open country where it is an aerial feeder rarely landing and is known to spend nights without landing (Pizzey and Knight, 1997). The species may forage or pass over the Iluka Eneabba Lease, but it is unlikely to be a permanent resident (Bamford and Bancroft, 2006).

Iluka Resources review of historic pit trapping data from detailed invertebrate surveys conducted at Eneabba over the last 25 years in both native vegetation and rehabilitation areas yielded no recordings of either the Shield-backed Trapdoor Spider *Idiosoma nigrum* (Schedule 1, fauna that is rare or likely to become extinct, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2006*) or the Scorpion Fly *Mecopteran Austromerope poultoni* (listed by DEC as Priority 2, taxa with few, poorly known populations on conservation lands) (Iluka Resources, 2006).

Previous advice provided by the Department of Environment and Conservation (DEC, formerly CALM) for the nearby Adamson A proposal stated that:

- It is unlikely that the Shield-Backed Trapdoor Spider and the Scorpion Fly would be significantly impacted as a consequence of the proposed clearing based on the habitat availability in the local area, size and extent of proposal and available knowledge of these taxa in the local area (CALM 2005).

The Rufous Fieldwren *Calamanthus campestris montanellus* (listed by DEC as Priority 4, taxa in need of monitoring) is listed by DEC as a priority sub-species and is not afforded special protection under any Acts. It is a species that inhabits very low heath, has previously been recorded at Eneabba, and is likely to be a permanent and widespread resident species. Although this species is likely to be displaced temporarily during the mulching period and regeneration of the vegetation, there is a significant proportion of remaining habitat in the general area to support the displaced birds. This bird has been found to recolonise rehabilitation very well (M. Bamford pers.comm., as cited in Iluka Resources, 2006). Iluka Resources' historic and ongoing rehabilitation initiatives at Eneabba are important for this species and any long term impacts are unlikely. The Rufous Fieldwren is known to breed between July and November (Pizzey and Knight, 1997). The proposed clearing will most likely occur between January and May of each year, which will further minimise potential disturbance to breeding birds.

The proposed application is for the mulching of native vegetation for use in rehabilitation. Previous studies at Eneabba have shown that within three years mulched vegetation can rehabilitate to a condition, density and diversity similar to the original native vegetation (Woodman Environmental Consulting, 2005). There will be an initial loss of native vegetation, but no long-term loss of native vegetation, and therefore no overall loss of significant habitat to fauna indigenous to Western Australia.

Based on the above, the proposal is not likely to be at variance to this principle.

Methodology

Bamford and Bancroft (2006)
CALM (2005)
Iluka Resources (2006)
Pizzey and Knight (1997)
WA Museum (2003)
Woodman Environmental Consulting (2005)

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

Comments

Proposal may be at variance to this Principle

The proposed application is for the mulching of native vegetation, which involves the cutting of vegetation to 30 centimetres above ground level and leaving the plants root system in place (Iluka Resources, 2006). The mulched vegetation is then immediately used to cover recently reinstated areas and is an important component of the native vegetation rehabilitation process carried out on site (Iluka Resources, 2006).

An Adamson Vegetation Survey was conducted in 2005, covering 846 hectares, which encompassed the current application areas. It was found that a total of 206 plant species belonging to 31 plant families occurred within the survey area (Woodman Environmental Consulting, 2005). Fifteen separate plant communities were mapped for the Adamson area, seven of which occur within the current application area (Woodman Environmental Consulting, 2005). During the 2005 survey, no Declared Rare Flora (DRF) plant species were recorded within the proposal area, however, 13 Priority flora species were recorded.

Twelve DRF species have previously been recorded in the Eneabba region (GIS Database; Woodman Environmental Consulting, 2005), and twenty-five Priority species within ten kilometres of the mulching area (GIS Database). This suggests the vegetation within the clearing area and immediate surrounds may support significant numbers of DRF and Priority species.

The 12 DRF species known to occur in or adjacent to the Eneabba area are:

- *Eucalyptus crispate*
- *Eucalyptus johnsoniana*
- *Eucalyptus rhodantha* var. *rhodantha*
- *Eucalyptus suberea*
- *Grevillea althoferorum*
- *Grevillea curviloba* subsp. *incurva*
- *Leucopogon obtectus*
- *Paracaleana dixonii* ms
- *Stawellia dimorphantha*
- *Tetratheca nephelioides* ms
- *Thelymitra stellata*
- *Verticorda albida* (Iluka Resources, 2006).

The 13 Priority species recorded during the Adamson Vegetation Survey are:

- *Calytrix chrysantha* (P3)
- *Calytrix superba* (P3)
- *Daviesia chapmanii* (P4)
- *Daviesia epiphyllum* (P3)

- *Eucalyptus macrocarpa* subsp. *elachantha* (P4)
- *Georgeantha hexandra* ms (P4)
- *Grevillea rudis* (P4)
- *Hemiandra* sp. Eneabba (H. Demarz 3687) (P1)
- *Isopogon tridens* (P3)
- *Mesomelaena stygia* subsp. *deflexa* (P1)
- *Pityrodia viscida* (P3)
- *Stachystemon axillaris* (P4)
- *Verticordia aurea* (P4)

Based on the above, the proposal may be at variance to this principle.

Methodology Iluka Resources (2006)
Woodman Environmental Consulting (2005)
GIS Database:
Declared Rare and Priority Flora List - CALM 01/07/05

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments

Proposal is not likely to be at variance to this Principle

The closest known Threatened Ecological Community (TEC) is the State listed type 72 Ferricrete floristic community (Rocky Springs type) located approximately five kilometres southwest of the proposed clearing area (GIS Database; DEC, 2006).

Woodman Environmental Consulting (2006) states that no current or proposed TEC was observed during their Adamson Vegetation Survey in 2005, which encompassed the proposed application area.

The distance between the TEC and the areas proposed to be mulched is such that detrimental effects resulting from the proposed mulching are unlikely.

Based on the above, the proposal is not likely to be at variance to this principle.

Methodology DEC (2006)
Woodman Environmental Consulting (2006)
GIS Database:
Threatened Ecological Communities CALM 12/04/05

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

Comments

Proposal is at variance to this Principle

The proposed mulching area is situated within the GS3 Lesueur Sandplain IBRA subregion (GIS Database). Approximately 40.9% native vegetation cover remains within this subregion (Shepherd et al., 2001). A similar percentage (38.7%) of remaining native vegetation is found within the Shire of Carnamah.

The vegetation association proposed to be mulched is classified as Beard vegetation association 379 (Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region) (GIS Database). Approximately 98,743 hectares or 26.7 % of Beard vegetation association 379 remains within the subregion (Shepherd et al., 2001), and 20.7% within the State.

Based on the national Objective Targets for Biodiversity Conservation 2001-2005, the extent of vegetation type 379 left within the Lesueur Sandplain IBRA Subregion is classified as vulnerable.

	Pre-European area (ha) *	**Current extent (ha) ***	**Remaining %***	**Conservation Status****	**% in reserves/CALM-managed land ***
IBRA Subregion Lesueur Sandplain	1,171,804	478,987	40.9%	Depleted	41.4 %
Shire of Carnamah	290,750	112,511	38.7 %	Depleted	Not available
Beard vegetation Association 379 (Shrublands; scrub-heath on lateritic sandplain)	370,097	98,743	26.7%	Vulnerable	18.7 %

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

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes	**(Department of Natural Resources and Environment 2002)**
Presumed extinct	Probably no longer present in the bioregion
Endangered*	<10% of pre-European extent remains
Vulnerable*	10-30% of pre-European extent exists
Depleted*	>30% and up to 50% of pre-European extent exists
Least concern	>50% pre-European extent exists and subject to little or no degradation over a majority of this area
*** or a combination of depletion, loss of quality, current threats and rarity gives a comparable status**	

Based on the above, the proposal is at variance to this principle.

Methodology Department of Natural Resources and Environment (2002)
Shepherd et al. (2001)
GIS Database:
Interim Biogeographic Regionalisation of Australia (subregions) EA 18/10/00
Pre European Vegetation DA 01/01

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

Comments

Proposal is at variance to this Principle

No wetlands are located or linked to the area of native vegetation proposed to be mulched (Iluka Resources, 2006).

According to available databases, two watercourses transect the application area (GIS Database). They are described as minor, non perennial watercourses that do not support riparian vegetation (GIS Database; Iluka Resources, 2006).

The proposed application is for the mulching of vegetation. The mulching of native vegetation involves the cutting of vegetation to 30 centimetres above ground level, leaving the plants root systems in place (Iluka Resources, 2006). It is therefore unlikely that these actions will alter natural water flow patterns.

The average annual rainfall for the application area is approximately 500 millimetres (GIS Database). Average annual evaporation in the application area is approximately 2,400 millimetres (GIS Database). It is therefore expected that there would be little surface water flow during normal seasonal rains.

Based on the above, the proposal is at variance to this principle.

Methodology Iluka Resources (2006)
GIS Database:
Evaporation Isopleths - BOM 09/98
Mean Annual Rainfall Surface (1975-2003) - DOW
Rivers 250K - GA

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

Comments

Proposal is not likely to be at variance to this Principle

The application areas consist of grey sand soils, and are subject to strong sea breezes in summer (Iluka Resources, 2006). Guidelines with regards to soil erosion caused by wind (Wells and King, 1989) indicate that the area has a capability class of IV, which allows clearing with wind protection. Wind erosion is the main land degradation risk associated with clearing on this land type (DAFWA, 2007).

The proposed clearing is for the mulching of native vegetation, which involves the cutting of the vegetation to 30 centimetres above ground level and leaving the plants root systems in place. This technique minimises the potential for wind erosion to occur (Iluka Resources, 2006). The mulched vegetation is then immediately used to cover recently reinstated areas and is an important component of the native vegetation rehabilitation process carried out on site. Both the preservation of the root systems of the mulched areas and the immediate transfer of mulched vegetation onto rehabilitation areas reduces potential erosion for both sites.

DAFWA (2007) has stated that the proposed harvesting operation will leave a significant amount of rooted biomass on site. Experience has shown this to satisfactorily regenerate post harvest. This, combined with the minimal soil disturbance ensures that the soil erosion risk is very low (DAFWA, 2007).

As part of its reporting requirements under clause 8 of the Mineral Sands (Eneabba) Agreement Act 1975, Iluka

Resources is required to submit detailed triennial reports that specifically address water quality surface water discharge, rehabilitation plans and monitoring. Officers of the Department of Mines and Petroleum (DMP), DEC and the Department of Water (DoW) inspect the operations at least once a year as a part of the Mineral Sands Agreement Rehabilitation Coordinating Committee (MSARCC) to review soil erosion and water management issues.

A Dieback Management Plan exists for all Iluka Resources operations at Eneabba. A revised version of that document aiming to incorporate current best practices has been reviewed by DEC and has not been finalised at this stage. Two clearing permit conditions have been stipulated for this permit in view of the comments on the draft Dieback Management Plan provided by DEC to Iluka Resources.

Weed management is also part of the rehabilitation process on site and previous site visits by DoIR environmental officers do not indicate any serious issues in relation to weed or dieback management arising from current practices at the Eneabba operations.

Based on the above, the proposal is not likely to be at variance to this principle.

Methodology DAFWA (2007)
Iluka Resources (2006)
Wells and King (1989)

(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 conservation area (South Eneabba Nature Reserve) is situated 3 kilometres to the west of the application area (GIS Database).

The application is for the mulching of native vegetation, which will then be used to rehabilitate previously mined areas. The rehabilitation of these areas utilising the mulch will contribute to maintaining native vegetation linkages in the area (Iluka Resources, 2006).

Based on the above, the proposal is not likely to be at variance to this principle.

Methodology Iluka Resources (2006)
GIS Database:
CALM Managed Lands and Waters - CALM 01/07/05
Eneabba 1.2 Orthomosaic - DOLA 98

(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 not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The whole of the Eneabba operations are subject to Licence 5645/7 under part V of the *Environmental Protection Act 1986*. The licence provides controls over groundwater and surface water runoff water quality by requiring an annual report on water quality, quantity and result monitoring against ANZECC guidelines and previous results. Condition W2(b) (i-v) defines discharge limits (pH, salinity, turbidity, erosion and impacts on surrounding vegetation).

Groundwater at Eneabba is situated below the ore bodies and will not be impacted by the proposed mulching of vegetation, which only removes vegetation to 30 centimetres above ground level (Iluka Resources, 2006).

As the area subject to application is not classified as being in a Salinity risk area (GIS Database), the proposed clearing is unlikely to increase land salinisation in the area.

The proposed clearing area does not occur within an area where potential Groundwater Dependant Ecosystems may occur (GIS Database).

Based on the above, the proposal is not likely to be at variance to this principle.

Methodology Iluka Resources Ltd. (2006)
GIS Database:
Public Drinking Water Source Area DoE 07/02/06
Potential Groundwater Dependant Ecosystems DoE 2004
Salinity Risk LM 25m DOLA 2000

(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

Although two minor non-perennial watercourses transect the proposed mulching area, at 120 metres above sea level, the proposed mulching area does not fall within a designated floodway or flood fringe area (GIS Database).

Furthermore, the application is for the mulching of vegetation to a height of 30 centimetres above ground level, not the removal. It is unlikely that these actions will alter natural water flow patterns. Iluka Resources (2006) states that the mulching of vegetation will not cause, or exacerbate, the incidence of flooding

The average annual rainfall for the application area is approximately 500 millimetres (GIS Database). Average annual evaporation in the application area is approximately 2,400 millimetres (GIS Database). It is therefore expected that there would be little surface water flow during normal seasonal rains.

Based on the above, the proposal is not likely to be at variance to this principle.

Methodology

Iluka Resources (2006)
GIS Database:
DoE FMD ARI Floodway and Floodfringe Areas 2003
DoE Hydrography 2004
DOLA Statewide Topographic Contours 2002

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

Comments

There are two Native Title Claims over the area under application, WC98/057 and WC04/002 (GIS Database). These claims have been registered with the National Native Title Tribunal. However, the mining lease has been granted, and the clearing is for a purpose consistent with the lease, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no known Aboriginal Sites of Significance located within the clearing permit area (GIS Database). It is the proponent's responsibility to ensure compliance with the *Aboriginal Heritage Act 1975* and to ensure that no Aboriginal Sites of Significance are disturbed as a result of the clearing process.

A submission was received raising four points, which are considered below:

1) That the clearing does not interfere with any Aboriginal Sites and be undertaken in compliance with the Aboriginal Act 1972.

   Such issues cannot be addressed in the assessment of a clearing permit application, as they are not mentioned in the clearing principles listed in Schedule 5 of the Environmental Protection Act 1986. According to information available, there are no known Aboriginal Sites of Significance located within the clearing permit area (GIS Database).

2) Native vegetation is used by Aboriginal people for bush tucker and medicine, and the Eneabba area vegetation supports Emu populations which are hunted for sustenance. That those social and cultural uses of land continue to this day and should be considered in the assessment because they fall within the definition of Environment under section 3(2) of the Environmental Protection Act 1986.

   As for point 1 above, such issues cannot be addressed in clearing permit assessments, as they are not criteria which are outlined in the clearing principles listed in Schedule 5 of the Environmental Protection Act 1986. However, it is expected that food and medicine plants will return with the natural regeneration of the mulched vegetation. The respondent is urged to contact the applicant in this regard.

3) That the current proposal is likely to be at variance with Clearing Principle (e).

   The assessor has assessed this application and determined that based on the size and nature of the vegetation proposed to be mulched, this proposal is at variance to principle (e). However, considering that mining has been occurring in the area since 1970's, and that Iluka Resources Ltd has a proven track record with rehabilitation, it is unlikely that the proposed clearing will have long term impacts on the area. Furthermore, no net loss of native vegetation due to the proposed mulching is expected in the long-term.

4) That a cumulative effects assessment be undertaken given the number of successive applications that have been lodged in this area and that consideration should be given to referring the whole proposal to the Environmental Protection Authority (EPA).

   The nature of mineral sands operations is such that new or previously mined areas are cleared, mined

and rehabilitated over a relatively short time period compared to other mineral extraction activities. The rehabilitation activities carried out by Iluka at Eneabba are of a high standard and provided that such standards are maintained the likelihood of detrimental cumulative effects resulting from the clearing of native vegetation alone are not likely to be significant in relation to the clearing principles.

This Clearing Permit Application, as well as previous applications (CPS716/1, 1549/1) has been referred to the EPA. The EPA set the level of assessment as: 'Not assessed, public advice given, assessed under Part V, clearing regulations' for this proposed clearing.

Advice previously provided by the DEC for surrounding areas, in relation to the existing *Environmental Protection Act 1986* and water licenses that are currently in place at Iluka Resources Ltd Eneabba operations site did not raise any issues in relation to this clearing permit application (DEC, 2006). It is the proponent's responsibility to liaise with the DEC 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.

The Shire of Carnamah, in a letter dated 5 January 2007, expressed no objection to this clearing permit application.

Mining at the Iluka Resources Ltd Eneabba operations is conducted under the *Mineral Sands* (*Eneabba*) *Agreement Act 1975*.

Iluka Resources has requested an amendment to Clearing Permit CPS 1662/1 (granted on 16 June 2007) for an extension of the expiry date from 29 Janurary 2010 to 15 March 2012. No further assessment against the 10 Clearing Principles is required to undertake this amendment.

Methodology

DEC (2006)
EPA (2007)
GIS Database:
Aboriginal Sites of Significance
Native Title Claims - DLI 19/12/04

4. Assessor's comments

Comment

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

Should the permit be granted it is recommended that conditions be imposed for the purposes of weed and dieback management, flora management, mulching management, record keeping and permit reporting.

5. References

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report prepared for Iluka Resources Limited Eneabba Operations dated September 2005.

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.