Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1739/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Pioneer Nickel Limited**

1.3. Property details

Property: Mining Lease M74/163
Local Government Area: Shire of Ravensthorpe
Colloquial name: Ravensthorpe Project

1.4. Application

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

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. Two beard vegetation associations have been mapped over the area proposed to be cleared. These are: **691**: Shrublands; *Dryandra quercifolia* and *Eucalyptus* spp. thicket; and **934**: Shrublands; mallee scrub (*Eucalyptus nutans*) (GIS Database; Shepherd *et al.*, 2001). The vegetation within the clearing permit application area has been mapped in further detail by Craig (2005; 2006). A 10 metre wide corridor was surveyed along each of the proposed exploration lines (5 meters either side). Two vegetation communities were mapped as occurring within the proposed clearing areas, broadly associated with geographical features: **Low Rises:** Shallow soils over outcropping gneiss support an open mallee and mid-dense heath, which includes scattered patches of tall shrubs of *Allocasuarina campestris* and *A. huegeliana*. Common species include *Eucalyptus desmondensis*, *E. suggrandis*, *E. flocktoniae*, *E. incrassata*, *Melaleuca hamata*, *M. glaberrima*, *Acacia mimica* ssp. *angusta*, *A. ingrata*, *Dodonaea pinifolia* and *Lepidosperma brunonianum* (Craig, 2005; 2006). **Drainage Lines:** Shallow lines are characterised by *Eucalyptus sporadica*, *Melaleuca acuminata*, *M. elliptica*, *Calothamnus quadrifidus*, *Gastrolobium parviflorum*, *Acacia* sp. Cape Arid, *Phyllanthus calycinus* and *Chorizema multiarticulata*. An east-west drainage line is characterised by *Eucalyptus phenax*, *E. cernua*, *Senna artemisoides* ssp. *filifolia*, *Hakea commutata*, *Eremophila densifolia*, *Acacia bifaria* and *Cassytha melantha* (Craig, 2005; 2006).	Pioneer Nickel Ltd have applied to clear up to 1.54 hectares of native vegetation, for the purpose of mineral exploration (using drill holes) and access tracks. The area has been previously disturbed by historical mining and exploration activities. An extensive network of gridlines, tracks and fences allow light vehicle access to much of the proposed clearing area for exploration, however washouts and regrowth have partially blocked access for larger vehicles. These tracks may require clearing for safe access (Pioneer Nickel Ltd, 2006).	Pristine: No obvious signs of disturbance (Keighery, 1994) To Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994)	Pioneer Nickel Limited's (Pioneer Nickel Ltd's) Ravensthorpe project area is located on Mining Lease M74/163, close to the historical Elverdton Tailings Storage Facility, approximately eight kilometres south east of Ravensthorpe. Mining and exploration has been conducted on an intermittent basis in the Elverdton-Desmond area for approximately 100 years. As a result of these activities there is an abundance of old mine workings in the vicinity of the clearing application area (Pioneer Nickel Ltd, 2006). Several flora surveys have been completed for the Ravensthorpe area, including 'Elverdton - Desmond M74/163 Declared Rare and Priority Flora Survey', in November 2005 (Craig, 2005) and November 2006 (Craig, 2006). These surveys specifically targeted nominated grid lines and drill sites to ensure that areas containing Declared Rare and Priority flora were identified before commencement of proposed operations (Pioneer Nickel Ltd, 2006). Bridal Creeper (*Asparagus asparagoides*), a Weed of National Significance, is especially common and is smothering the vegetation in some areas (Craig, 2005). A site inspection of the application area was conducted on 14 December 2006 for the purposes of assessing a previous clearing application (CPS 1575/1), by an Environmental Assessor from the Native Vegetation Branch and Environmental Officers from the Minerals Environment Branch of the Department of Industry and Resources (DoIR).

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 clearing area is located within the Esperance Plains Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion, and the Fitzgerald IBRA subregion (GIS Database). These regions have been recognised as areas high in biodiversity (Conservation International, 2007).

This proposal is located within the Elverdton-Desmond area. The Elverdton-Desmond area and surrounding areas are one of the three areas of highest flora endemism in Western Australia, with more than 60 endemic species with a range of less than 30 kilometres (Pioneer Nickel Ltd, 2006). The proposed clearing area is within the Ravensthorpe Range (Red Book System 3.8). The area is also recognised as an 'Environmentally Sensitive Area', as it forms a part of the 'Ravensthorpe Corridor', and has been listed by the Australian Heritage Commission on the Register of National Estate, due to its high level of botanical diversity (GIS Database; AHC, 2007). The Ravensthorpe Corridor is an important vegetation remnant that links the Fitzgerald River National Park and Crown land east of the Vermin Proof Fence and beyond to the Goldfields (Craig, 2005). The area proposed to be cleared also forms in the eastern sector of the Fitzgerald Biosphere which is a part-tenured management concept recognised by United Nations Educational, Scientific and Cultural Organisation (UNESCO) as well as State and Commonwealth Governments (Craig, 2005).

The proposed clearing area is small, and therefore is unlikely to significantly impact on the viability of the area for fauna foraging and habitat.

A survey of the exploration lines found that four priority species do occur in the area, and may be impacted by the proposed clearing (Craig, 2005; 2006). These are *Astartea* sp. j*erdacuttup* (P1), *Acacia bifaria* (P3), *Acacia errabunda* (P3) and *Eucalyptus desmondensis* (P4) (Craig, 2005; 2006). DEC (2006; 2007) advice states that the planned clearing will not significantly impact on the Priority Flora species.

The Ravensthorpe area has had a long history of exploration and mining (~100 years) and farming (~130 years). There has been considerable disturbance in the Elverdton-Desmond area as a result of historical mining and exploration activities (Pioneer Nickel Ltd, 2006). Aerial photography of the proposed clearing area shows a vast array of exploration and access tracks. Many of the old access tracks have good regrowth, particularly of the Priority Four species *Eucalyptus desmondensis.* A weed of National Significance, the Bridal Creeper (*Asparagus asparagoides*), occurs around old mine workings and along creeklines (Craig, 2005). Weed invasion is likely to increase from the edges of disturbed areas and therefore the proposed clearing is likely to favour the spread of weeds, which will lead to a decrease in biodiversity of the area. In order to ensure that all precautions are taken to prevent the introduction or spread of weeds, a condition will be placed on the permit to avoid clearing exploration lines while Bridal Creeper is seeding (late spring to early summer), and ensure all vehicles and machinery are washed down prior to entering the site, to remove any soil or plant propagules.

A number of management strategies have been identified by the proponent to minimise the impact of exploration activities on the biological diversity of the area (Pioneer Nickel Ltd, 2006). These include:

- use of existing tracks and disturbed areas;
- clearing by raised blade or hand;
- locating tracks to avoid large trees and shrubs and their root zones;
- cleaning of earthmoving machinery prior to entering site, and therefore minimising weed spread;
- following dry soil procedures to prevent spread of dieback;
- stockpiling vegetation and respreading where possible to provide habitat for fauna and to assist revegetation by providing a local seed source;
- implementing a weed management program where required; and
- ensuring all staff and contractors are subject to the Pioneer Nickel Elverdton-Desmond Project Area Environmental induction (Pioneer Nickel Ltd, 2006).

Based on the above, the proposed clearing may be at variance to this Principle. However, the Department of Environment and Conservation (DEC) (2006) advice states that the proposed clearing area is extensively disturbed from historical mining activities and this current proposal will provide an opportunity to rehabilitate the site post this operation. Considering the relatively small area to be cleared, and dispersed nature of the clearing, it is not likely to compromise the diversity of the vegetation in the application area.

Methodology

Conservation International (2007).
Craig (2005).
Craig (2006).
DEC (2006).
DEC (2007).
EPA (1993).
Pioneer Nickel Ltd (2006).
GIS Database:
- Clearing Regulations - Environmentally Sensitive Areas - DOE 30/5/05.
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00.

- Interim Biogeographic Regionalisation of Australia - EA 18/10/00.- Pre-European Vegetation - DA 01/01.

(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

GIS Databases show 27 records of rare fauna within 10 kilometres of the proposed clearing area. A search of the DEC's and the Commonwealth Department of Environment and Heritage databases conducted by the proponent, found that 17 species of Fauna of Conservation Significance have the potential to occur in the application area, based on known distributions. The species found are:

- *Dasyurus* geofroii (Chuditch) (Schedule 1);
- *Myrmecobius fasciatus* (Numbat) (Schedule 1)*;*
- *Parantechinus apicalis* (Dibbler) (Schedule 1)*;*
- *Pseudomys shortridgei* (Heath Mouse – Dayang) (Schedule 1)*;*
- *Leipoa acellata* (Malleefowl) (Schedule 1)*;*
- *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo) (Schedule 1)*;*
- *Calyptorhynchus sp* (White Tailed Black Cockatoo) (Schedule 1)
- *Pezoporus wallicus flaviventrus* (Western Ground Parrot) (Schedule 1)*;*
- *Dasyornis longirostris* (Western Bristle Bird) (Schedule 1)*;*
- *Lerista viduata* (P4)*;*
- *Macropus irma* (Western Brush Wallaby) (P4)*;*
- *Pseudomys occidentalis* (Western Mouse) (P4)*;*
- *Hylacola cauta whitlocki* (Shy Heathwren – western ssp.) (P4)*;*
- *Oreoica gutturalis gutturalis* (Crested Bellbird) (P4)*;*
- *Pomatostomus superciliosus ashby* (White-browed Babbler) (P4)*;*
- *Psophodes nigrogularis Oberon* (Western Whipbird) (P4)*;* and
- *Macropus eugenii derbianus* (Tammar Wallaby) (P5) (Pioneer Nickel Ltd, 2006).

Based on the small area of clearing, it is unlikely that the habitat of any of these species will be significantly affected by the proposed clearing.

A further five species listed as migratory species under the *Environmental Protection and Biodiversity Conservation Act 1999* may occur in the project area, however the proposed exploration is unlikely to impact critical feeding or breeding habitat for any migratory species (Pioneer Nickel Ltd, 2006).

The vegetation within the project area is ecologically important as it forms part of a narrow corridor which links the Fitzgerald River National Park to the expansive crown lands of the interior (Craig, 2005). However, given the small amount of clearing, and that rehabilitation of cleared vegetation will be undertaken progressively, it is unlikely that the proposed clearing will impede the use of this corridor by fauna.

The Department of Environment and Conservation previously provided advice to a consultant of Pioneer Nickel Ltd that DEC does not consider it necessary for the company to conduct a comprehensive fauna assessment in support of this exploration proposal given the scale and nature of the activities (DEC, 2006). DEC (2006) considers the proponent has undertaken an adequate desktop assessment of the potential impacts on conservation significant fauna.

Management strategies identified by the proponent (Pioneer Nickel Ltd, 2006) to minimise the impact of exploration activities on habitat which may be significant for fauna indigenous to Western Australia include:

- minimising impact by avoiding large trees, shrubs and their root zones;
- retaining trees (especially those with hollows) for bird, bat and reptile habitat where possible;
- revegetating impacted areas;
- avoiding habitats such as Malleefowl nests;
- implementing feral animal control where required in conjunction with local landowners; and
- ensuring all staff and contractors are subject to the Pioneer Nickel Elverdton-Desmond Project Area Environmental Induction.

Pioneer Nickel Ltd (2006) states that all efforts will be taken to minimise clearing, and to progressively rehabilitate areas cleared so that any fauna of conservation significance and significant fauna habitat in the area are not impacted upon by the proposed activities.

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

Methodology

Craig (2005).
DEC (2006).
Pioneer Nickel Ltd (2006).
GIS Database:
- CALM Threatened Fauna - CALM (30/09/2005).

(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

GIS Databases show the nearest Declared Rare Flora (DRF) to be the *Daviesia megacalyx*, located approximately 750 meters east of the proposed clearing area. DEC (2006; 2007) advice states that the actual location of this species is some 2500 metres east of the proposed clearing area. According to the GIS Database, the nearest population of a Priority 1 flora species is the *Microcorys pimeleoides*, located approximately 5 metres north of one of the exploration lines. This species was not located by the consultant botanist, and it is believed that the record is out of date, or entered in the database incorrectly (Craig, 2006).

This proposal is located within the Elverdton-Desmond area. The Elverdton-Desmond area and surrounding areas are one of the three areas of highest flora endemism in Western Australia, with more than 60 endemic species with a range of less than 30 kilometres (Pioneer Nickel Ltd, 2006). Many of the DRF and Priority flora species that occur in the Ravensthorpe Range are local endemics, e.g. *Acacia bifaria* (P3), *Eucalyptus desmondensis* (P4), *Siegfriedia darwinioides* (P4), *Spyridium glaucum* (P4), which may be locally abundant but have a restricted range and are consequently vulnerable to threatening processes such as fire, plant disease and climate change (Craig, 2005).

Declared Rare and Priority Flora surveys were undertaken by Craig in November 2005 (Craig, 2005) and November 2006 (Craig, 2006), within the proposed exploration lines that are the subject of this purpose permit. No DRF was found during the surveys. Four species of Priority flora occur in the areas proposed to be cleared, and will potentially be impacted by the proposed clearing activity. These are *Astartea* sp. *jerdacuttup* (P1), *Acacia bifaria* (P3), *Acacia errabunda* (P3) and *Eucalyptus desmondensis* (P4) (Craig, 2005; 2006).

One plant of *Astartea* sp. *jerdacuttup* (P1) was found growing adjacent to an exploration line and will not be cleared. Yellow flagging was placed around the south side of the plant, so that it will not be inadvertently disturbed during exploration (Craig, 2005).

Up to 10 plants of *Acacia bifaria* (P3) were recorded during the Craig (2006; 2007) surveys. *Acacia bifaria* is well represented in the Ravensthorpe region, extending from the lower, western slopes of the Ravensthorpe Range to the Fitzgerald River. This species is widespread in low lying areas in the vicinity of two of the proposed exploration lines. This forms a part of the southernmost known population and probably extends westward to the Hopetoun-Ravensthorpe Road (Craig, 2005).

Acacia errabunda (P3) was found during the November 2006 survey. Approximately 40 plants were found in the southern sector of a rehabilitated gravel pit. Drilling on the easternmost section north of Elverdton Road would result in clearing of about 11 plants. Craig (2006) suggested that drilling at the site be deferred for two years, until the *A. errabunda* population has established a significant seed reserve in the soil, which would lead to natural regeneration after exploration. The proponent has committed to avoiding disturbing the gravel pit as far as practicable. *Acacia errabunda* is abundant in, and immediately adjacent to Cordingup Creek (located approximately 4 kilometres north of the proposed clearing area), and has an extensive range, being known from Jerramungup-Needilup, Broomehill and Ravensthorpe.

Eucalyptus desmondensis (P4) is principally restricted to granite sands in the Ravensthorpe Range, with the largest known population in the Mt Desmond-Elverdton area (Craig, 2005). *Eucalyptus desmondensis* was common and widespread in the survey area, particularly in the shallow coarse sand over gneiss that occurs on low rises. Disturbed areas within the tenement, such as around the old mine workings and old tracks, have had a good regeneration of *E. Desmondensis* (Craig, 2005).

Pioneer Nickel Ltd (2006) states that the Project Manager will be provided photographs and descriptions of the Priority species so that any plants encountered can be flagged and avoided where possible. Field personnel will be briefed on the Priority species and possible impacts as part of their job specific induction. Furthermore, Pioneer Nickel Ltd (2006) have advised that clearing of any species of conservation significance will be avoided where possible. Where disturbance cannot be avoided, the Environmental Manager will liaise with DEC Wildlife Branch for approval to disturb them (Pioneer Nickel Ltd, 2006).

Pioneer Nickel Ltd have also committed to avoid clearing of the gravel pit where possible, to avoid *Acacia errabunda* (Pioneer Nickel Ltd, 2007). If the clearing is needed, a consultant botanist familiar with the site will be present to cordon off the plants at the time of the clearing, and / or offset lines sufficiently within the terms of the clearing permit, to avoid the plants where possible (Pioneer Nickel Ltd, 2007)

As Priority flora occurs within the application area, the proposed clearing may be at variance to this Principle. However, DEC (2006; 2007) advice states that the planned operations would not appear to be of significant scale to cause a significant impact upon the Priority Flora species located within the project area.

Methodology

Craig (2005).
Craig (2006).
DEC (2006) .
DEC (2007).
Pioneer Nickel Ltd (2006).

Pioneer Nickel Ltd (2007).
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

There are no known endorsed Threatened Ecological Communities (TECs) in the vicinity of the application area (GIS Database). There is, however, a plant community of interest that is being surveyed for occurrence and possible nomination as a TEC, approximately two kilometres from the proposed clearing area on top of Mt Desmond (DEC, 2006).

Due to the distance between the proposed clearing and that plant community, it is unlikely that the proposed clearing will impact the community that is being considered for TEC nomination.

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

Methodology

DEC (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 not likely to be at variance to this Principle

The application area falls within the Esperance Plains Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion, and the Fitzgerald IBRA sub-region (GIS Database). Shepherd *et al.* (2001) report that approximately 51.1% of the pre-European vegetation still exists in the Esperance Plains IBRA Bioregion, with approximately 54% in conservation reserves. Approximately 54% of the pre-European vegetation of the Fitzgerald IBRA sub-region still remains (Shepherd *et al.*, 2001).

The vegetation in the application area is recorded as Beard Vegetation Associations 934 and 691. According to Shepherd *et al.* (2001) approximately 48% and 97% of these respective vegetation types remain in the sub-region.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% in IUCN Class I-IV Reserves*
IBRA subregion – Fitzgerald	1,570,670	844,884	53.8%	Least concern	50.5
Shire of Ravensthorpe	865,342	512,776	59.3%	Least concern	
Beard vegetation association -					
- 934	8,342	3,971	47.6%	Depleted	24.8
- 691	35,490	34,274	96.6%	Least concern	43.7%

* Shepherd *et al.* (2001)
** Department of Natural Resources and Environment (2002)
*** Area within the Intensive Landuse Zone

Based on the small amount of vegetation to be cleared, the proposed clearing area does not represent a significant remnant of native vegetation. It is noted that the clearing area does occur within a significant remnant i.e. the Ravensthorpe corridor. However, the small area proposed to be cleared is likely to have minimal impacts on the viability and ecological functions of that remnant.

The long-term sustainability and viability of this corridor will largely depend on maintaining the vegetation in excellent condition (Craig, 2005). Pioneer Nickel Ltd will undertake rehabilitation of cleared areas in accordance with Department of Industry and Resource standards, which are part of *Mining Act 1978* tenement conditions (Pioneer Nickel Ltd, 2006; 2007).

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

Methodology

Craig (2005).
Department of Natural Resources and Environment (2002).
Pioneer Nickel Ltd (2006).
Pioneer Nickel Ltd (2007).
Shepherd *et al.* (2001).
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00.

- Interim Biogeographic Regionalisation of Australia - 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 may be at variance to this Principle

There are no permanent watercourses or wetlands within or associated with the area applied to clear. There is one minor, seasonal drainage line which traverses the project area (GIS Database). This is unlikely to experience water flows except under high rainfall events, usually during the winter period (BOM, 2007). Drainage measures will be implemented to prevent drainage shadow effect on vegetation, water erosion and to minimise risk of sedimentation of creeklines (Pioneer Nickel Ltd, 2006).

The Elverdton – Desmond area, where this clearing proposal is located, is on a catchment divide between the Steere River to the south, and the Cordingup Creek - Jerdacuttup River catchment to the north (GIS Database). North of Elverdton Road, the Ravensthorpe Range ridge intersects the north-east sector of the tenement. Here the proposed exploration lines cross a series of low rises that form the western, lower slopes of Mt Desmond. The low rises of the shallow soils over gneiss are intersected by minor drainage lines that eventually drain to Cordingup Creek (located 4 kilometres north) and the Jerdacuttup River (located 5 kilometres east) (Pioneer Nickel Ltd, 2006). Given the small amount of vegetation to be cleared, and the distance of the application area to any permanent watercourse, it is unlikely that these watercourses will be impacted upon through the clearing activity.

Based on the above, the proposed clearing may be at variance to this Principle. However, the impacts of the small area of the proposed clearing on a minor, seasonal watercourse are likely to be minimal.

Methodology

BOM (2007).
Pioneer Nickel Ltd (2006).
GIS Database:
- Hydgrography, linear - DoE 1/2/04
- 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 Department of Agriculture and Food Western Australia (DAFWA) (2006) describes the landscape and soils of the 'Ravensthorpe Zone' as rolling hills on greenstone (mafic and ultramafic) with alkaline sandy duplex soils with some clays, sands and gravel. Pioneer Nickel Ltd (2006) describes the soil within the application area as generally sandy and clayey with some areas of ironstone gravels. During a site visit of the application area conducted by DoIR officers on 14 December 2006, no soil erosion was observed, even in the areas that had previously been disturbed.

To minimise clearing, existing tracks will be used and any cleared areas will be rehabilitated in accordance with existing guidelines (Pioneer Nickel Ltd, 2006). Minimisation of land degradation will be achieved by applying best practice clearing and rehabilitation methods. Pioneer Nickel Ltd utilises a number of management strategies to achieve this. These include:

- Minimising the area requiring vegetation removal;
- Confining vehicle movements to clearly defined tracks;
- Conducting topsoil-stripping activities during periods of low winds;
- Following dry soil procedures to prevent the spread of dieback;
- Establishing vegetation on bare surfaces on completion of construction activities;
- Stockpiling topsoil for use in rehabilitation;
- Locating stream crossings where natural conditions provide for minimal bed and bank disturbance;
- Using drip trays to prevent hydrocarbon contamination of surrounding soil;
- Storing hydrocarbons and refuelling in bunded areas;
- Engineering drainage to prevent shadow effects on vegetation; and
- Ensuring all staff and contractors are subject to the Pioneer Nickel Ltd Elverdton-Desmond Project Area Environmental Induction (Pioneer Nickel Ltd, 2006).

DAFWA (2006) identified the Ravensthorpe area as having a moderate to high salinity risk. However, the proposed clearing of 1.54 hectares for exploration purposes is unlikely to be at variance with this principle for salinity or soil erosion, provided the disturbed areas are rehabilitated after drilling is completed. Under the conditions imposed on the mining tenement, Pioneer Nickel Ltd is required to rehabilitate all disturbances to the surface of the land made as a result of exploration are to be backfilled and rehabilitated no later than 6 months after disturbance unless otherwise approved in writing by the Environmental Officer, Department of Industry and Resources (DoIR) (MITIS, 2007).

There is no known occurrence of *Phytophthora cinnamomi* (dieback) within the proposed clearing area (DEC, 2006; DEC 2007). The Ravensthorpe area is recognised as being at risk to the introduction of dieback. The proposed exploration activities, will be undertaken during dry soil conditions to minimise accidental introduction of the plant pathogen (DEC, 2006).

Pioneer Nickel Ltd has made commitments to ensure that dieback is not introduced or spread through exploration activities. The procedure for operating in dieback-prone areas are addressed in 'Procedures and Practices and Health and Safety for Exploration and Drilling', by Pioneer Nickel Ltd (2006), and include:

- All vehicles are to be thoroughly washed down prior to entering the project area for the first time and every time thereafter that they have travelled on unformed roads, tracks or farm paddocks outside the Elverdton-Desmond Project Area;
- All vehicle movements on unformed roads are to be undertaken in dry weather conditions and should be suspended during rainfall events; and
- No vehicle movements are allowed in the project area other than on formed roads, existing established tracks, or drill pad access tracks without the approval of the Pioneer Nickel Ltd's Exploration manager.

Under the conditions imposed on this clearing permit, the proponent is required to conduct clearing activities during dry soil conditions, and ensure that all machinery is free of soil and vegetation prior to arrival on site.

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

Methodology

DAFWA (2006).
DEC (2006).
MITIS (2007).
Pioneer Nickel Ltd (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 may be at variance to this Principle

The Fitzgerald River National Park is 20 kilometres to the south west of the proposed clearing area, and is one of the richest flora conservation areas in Western Australia (Pioneer Nickel Ltd, 2006). It has a very high biodiversity containing a high proportion of geographically restricted and rare plants, with around 250 species considered to be of high conservation value (Pioneer Nickel Ltd, 2006). Some of these plants are also found outside the National Park in the Ravensthorpe Range and it is possible that some exist around the proposed clearing area.

This proposal is located within the Elverdton-Desmond area. The Elverdton-Desmond area and surrounding areas are one of the three areas of highest flora endemism in Western Australia, with more than 60 endemic species with a range of less than 30 kilometres (Pioneer Nickel Ltd, 2006). Conservation Through Reserves Committee (1974) recommended that the Ravensthorpe Ranges, within which this proposal is located, be classified as a “C” Class nature reserve, for its high floral biodiversity. The areas applied to clear is within the Ravensthorpe Ranges (Red Book System 3.8). The former Department of Conservation and Land Management (CALM, 1992), now the Department of Environment and Conservation, has recommended that the crown land which is located on tenement M47/163 become a Nature Reserve (Pioneer Nickel Ltd, 2006). Whilst the application area is within Red Book Area 3.8, it has not yet been made into a conservation area.

The proposed clearing area also forms a part of the Ravensthorpe corridor, recognised as an ESA by the DEC, and has been listed by the Australian Heritage Commission (AHC) on the Register of National Estate, due to its high level of botanical diversity (GIS Database; AHC, 2007). The Ravensthorpe corridor is an important vegetation remnant as it is one of the few access ways for the movement of flora and fauna between the Fitzgerald River National Park and the inland bush areas of central Australia (Craig, 2005). The long term sustainability and viability of this corridor will largely depend on maintaining the vegetation in excellent condition (Craig, 2005). Secondary impacts such as spread of dieback, weeds, erosion and drainage effects, can impact an area far in excess of the immediate project area (Craig, 2005). However, given the small amount of clearing, and that rehabilitation of cleared vegetation will be undertaken progressively, it is unlikely that the clearing will impede the use of this corridor by fauna. In addition, dry soil procedures will be undertaken to prevent the spread of dieback.

This proposed clearing area lies in the eastern sector of the Fitzgerald Biosphere which is a part-tenured management concept recognised by United Nations Educational, Scientific and Cultural Organisation (UNESCO), as well as State and Commonwealth Governments (Craig, 2005). The concept includes a core area (the Fitzgerald River National Park), a buffer zone (Crown land and some unvested reserves) and a zone of cooperation (private freehold farmland). Mining, subject to sound environmental management practices, is one of many human impacts acceptable in the zone of cooperation (Pioneer Nickel Ltd, 2006). The Fitzgerald Biosphere is recognised as being a 'hotspot' within the Earth's 34 global biodiversity hotspots (Conservation International, 2007). The flora of the Ravensthorpe Ranges area is recognised as being very rich, and containing many species not known from the surrounding areas (Conservation Through Reserves Committee, 1974). A number of the species are endemic, and others are common in the Range, but rare elsewhere. The area is a focal point for species of *Eucalyptus*, with over 20 taxa occurring in the area (AHC, 2007).

Based on the above, the proposed clearing may be at variance to this Principle. However, the small area proposed to be cleared is unlikely to significantly impact on the environmental values of the surrounding conservation areas.

Methodology

AHC (2007).
Conservation Through Reserves Committee (1974).
Craig (2005).
Pioneer Nickel Ltd (2006).
GIS Database:
- CALM Managed Lands and Waters - CALM 1/07/05.
- CALM proposed 2015 pastoral lease exclusions.
- CALM Regional Parks - CALM 12/04/02.
- Register of National Estate - EA 28/01/03.
- System 1 to 5 and 7 to 12 Areas - DEP 06/95.

(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 areas applied to clear do not fall within a Public Drinking Water Source Area (PDWSA) or PDWSA Protection Zone (GIS Database).

There are no surface water bodies present within the application area, as drainage lines are non-perennial (GIS Database; Pioneer Nickel Ltd, 2006). Given the small amount of vegetation to be cleared and the operator's commitment to avoiding watercourses and utilising existing tracks for exploration activities, it is unlikely that any watercourse will be impacted upon through the clearing activity.

Groundwater within the area under application is saline, between 7,000 - 14,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). The proposed clearing is unlikely to have an impact on regional groundwater considering the size of the area to be cleared, and the magnitude of the Yilgarn-Southwest groundwater province, which is in excess of 246,000 square kilometres in area (GIS Database). Similarly, the proposal is unlikely to impact upon ecological communities that are wetland or groundwater dependent.

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

Methodology

Pioneer Nickel Ltd (2006).
GIS Database:
- Groundwater Salinity, Statewide - DOW.
- Hydrogeography, linear - DoE - 01/02/04
- Public Drinking Water Supply Areas (PDWSAs) - DoE 28/04/05
- PDWSA Protection Zones - DoE 01/01/04.

(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 Ravensthorpe area is characterised by warm dry summers and cool wet winters (Pioneer Nickel Ltd, 2006). There is one minor, non-perennial drainage line north of Elverdton Road which runs through a number of proposed drill lines (GIS Database). The clearing of a total of 1.54 hectares in several disjunct locations is unlikely to cause or exacerbate the incidence or intensity of flooding.

Pioneer Nickel Ltd (2006) has outlined the following management procedures to minimise the effects of exploration activities on the risk of flooding:

- Engineering drainage;
- Utilising existing creek crossings where possible;
- Locating stream crossings where natural conditions provide for minimal bed and bank disturbance; and
- The cleared areas will be rehabilitated to further minimise the risk of flooding.

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

Methodology

Pioneer Nickel Ltd (2006).
GIS Database:
- Hydrogeography, linear - DoE 01/02/04

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

Comments

There are two native title claims (WC96/109; WC98/080) over the area under application (GIS Database). These claims have been registered with the National Native Title Tribunal. However, the mining tenements have

been granted in accordance with the future act regime of the *Native Title Act 1993*, and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

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

The proponent is required 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.

A previous clearing purpose permit (CPS 1575/1) for the purposes of mineral exploration, has been issued on the same tenement, and to the same proponent. The exploration lines from this clearing permit overlap a number of exploration lines of the previous permit.

This clearing permit application was referred to the EPA on the 6 March 2007, due to it being wholly within a Red Book Area, which is one of the triggers under the Memorandum of Understanding between DoIR and the EPA. The chairman determined that the proposal could be managed under the provisions of Part V of the *Environmental Protection Act 1986.*

Methodology EPA (2007).
GIS Database:
- Aboriginal Sites of significance - DIA (Status).
- Native title claims - DLI 7/11/05.

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mineral Exploration	Mechanical Removal	1.54		The proposal has been assessed against the clearing principles and may be at variance with principles (a), (c), (f) and (h). The proposal was considered not likely to be at variance with the other principles. However, due to the small size of the application area (1.54 hectares) and the minor and temporary nature of the proposed vegetation clearing, the Assessing Officer concludes that the environmental impacts are likely to be minimal. Consequently, the assessing officer recommends that the permit be granted subject to the following conditions: 1. When clearing native vegetation for access tracks under this permit, the Permit Holder must use a raised blade or hand clearing. 2. The Permit Holder must stockpile all native vegetation cleared under this permit for use in rehabilitation in accordance with Condition 4. Cleared native vegetation must be stockpiled in an area that has already been cleared. 3. The Permit Holder shall record the following for each instance of clearing: a) the location of 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; d) the area rehabilitated in hectares; e) the method of clearing; f) the purpose of clearing. 4. For each instance of clearing recorded under Condition 3, the Permit Holder must, within 6 months of the completion of exploration activities, rehabilitate all cleared areas by re-shaping the surface so that it is consistent with the surrounding 5 meters of uncleared land, and re-spreading the topsoil and vegetative material stockpiled under Condition 2 over each cleared area. 5. For each area rehabilitated under Condition 4 of this permit, the Permit Holder must record: a) the co-ordinates of areas rehabilitated using Geocentric Datum Australia 1994; b) the size of the areas rehabilitated in hectares; and c) the dates on which the area was rehabilitated. 6. Exploration activities shall only be undertaken by the Permit Holder during dry soil conditions. 7. The Permit Holder shall ensure that all vehicles and machinery prior to entering the permit area are free of soil and plant propagules. 8. The Permit Holder should avoid clearing whilst Bridal Creeper, *Asparagus asparagoides*, is seeding (late spring – early summer). 9. The Permit Holder shall provide a report to the Director, Environment Division, of the Department of Industry and Resources by 1 February 2008

and each subsequent year for the life of this permit, demonstrating adherence to all conditions of this permit, and setting out the records required under conditions 3 and 5 of this permit in relation to the clearing activities carried out between 1st January and 31st December the previous year.

5. References

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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.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union

RIWI Rights in Water and Irrigation Act 1914, Western Australia.
s.17 Section 17 of the Environment Protection Act 1986, Western Australia.
TECs Threatened Ecological Communities.

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

P1 **Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P2 **Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P3 **Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

P4 **Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

R **Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

X **Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

Schedule 1 **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.

Schedule 2 **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.

Schedule 3 **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

P1 **Priority One: Taxa with few, poorly known populations on threatened lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P2 **Priority Two: Taxa with few, poorly known populations on conservation lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P3 **Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P4 **Priority Four: Taxa in need of monitoring**: Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

P5 **Priority Five: Taxa in need of monitoring**: Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999)*

EX **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

EX(W) **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.