



1. Application details

1.1. Permit application details

Permit application No.: 1418/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: Western Areas NL

1.3. Property details

Property: M77/545
M77/912
M77/585
Local Government Area: Shire Of Kondinin
Colloquial name: Mining Lease 77/585 Forrestania Nickel Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.7		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 The proposed clearing area is mapped as Beard Vegetation Associations 511: Medium woodland, salmon gum & morrel; and 2048: Shrublands, scrub-heath in the Mallee Region (Shepherd et al, 2001).

A survey of the proposed clearing areas conducted by Jims Seeds, Weeds & Trees (2006) split the clearing areas into two separate locations - a powerline extension area and a monitoring bore and associated access track area.

Within the powerline extension area, the survey identified one vegetation community:

1) Eucalyptus woodland dominated by *Eucalyptus eremophila ssp eremophila*, with a mid-storey of *Eremophila drummondii*, *Leptospermum erubescens*, *Melaleuca adnata*, *M. elliptica*, *M. pauperiflora ssp pauperiflora*, *Eremophila scoparia*, *Grevillea oncogyne* and *Santalum acuminatum*, with an understorey of *Olearia muelleri*, *Atriplex lindleyi*, *Daviesia benthamii*, *Acacia deficiens*, *A. intricata* and *Wilsonia humilis*.

Within the access track and monitoring bore, the survey identified two vegetation types.

1) Eucalyptus mallee woodland dominated by *Eucalyptus eremophila ssp eremophila* and *Eucalyptus pileata*, with a mid-storey of *Melaleuca pauperiflora ssp. pauperiflora*, *Eremophila scoparia*, *Grevillea oncogyne* and *Santalum acuminatum*, with an understorey of *Olearia muelleri*, *Atriplex lindleyi*, *Daviesia benthamii*, *Acacia deficiens*, *A. intricata* and *Wilsonia humilis*.

2) Sandplain heath dominated by *Leptospermum erubescens* and *Allocasuarina campestris*, with a mid-storey of *Acacia acuminata*, *A. yorkkrakensis ssp acrita*, *Allocasuarina campestris*, *Eremophila drummondii* and *Santalum acuminatum*, with an understorey of *Westringia cephalantha*, *Baeckea crispiflora*, *Pimelea aeruginosa* and *Verticordia roei*.

Clearing Description The proposal includes the clearing of 1.7 hectares of vegetation on M77/545, M77/912 and M77/585 for the purpose of extending a powerline and to provide access to and installation of a monitoring bore to the north of the Sibelius bore field, which was requested by the Department of Environment. Western Areas have advised that the powerline will be above ground with poles spaced approximately 100m apart. The only clearing that will take place around the powerline will be where the poles are located, there will be some raised blade clearing to allow access to each pole location and vegetation will be slashed down in a ten metre radius from each pole. Areas cleared for construction of the powerline will be rehabilitated. The track to the monitoring bore will require ongoing clearing to maintain access.

Vegetation Condition Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive to Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)

Comment The vegetation condition was described by Jims Seeds, Weeds & Trees (2006b) as being degraded within the access track and monitoring bore area, and as excellent within the powerline extension area.

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 area under application occurs within the Lake Cronin Red Book area which is listed on the National Estate Register for its high level of flora and fauna diversity and endemism. According to the National Heritage Estate database (2006) 16 fauna species that are endemic either to the south-west region or to Western Australia occur within the Lake Cronin area. The Lake Cronin area is also described as being an important refuge for rare species due to widespread clearing in the wheatbelt to the west. Rare species include fauna such as Malleefowl (*Leipoa ocellata*), Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and Chuditch (*Dasyurus geoffroii*) and flora such as *Eucalyptus steedmanii*. The Lake Cronin area also represents the northern most limit of several fauna species distribution.

Two Beard Vegetation Associations are mapped within the proposed clearing area - 511 (Salmon Gum and Morrel medium woodland) and 2048 (Shrublands; scrub heath in mallee region). Statewide, 93.8% remains of Association 511 and 100% remains of Association 2048. (Shepherd et al, 2001a). The vegetation types are therefore largely uncleared and their conservation is not at risk from this proposal.

The proposed clearing area lies within the Coolgardie IBRA Bioregion which remains 98.4% uncleared. Threats to biodiversity as listed within the Coolgardie IBRA Bioregion (CALM, 2002) include fragmentation, altered fire regimes, weeds, grazing, feral predators, mining and changed hydrology. The proposed clearing has the potential to introduce weeds into an area that is weed free. A condition on the permit will require the permit holder to clean all machinery of vegetative and soil material prior to entering or leaving the proposed clearing area.

On a local scale, Jims Seeds, Weeds & Trees (2006) identified two vegetation types within an area for a proposed access track and monitoring bore (Mallee woodland and Sandplain heath) and one vegetation type within an area for a proposed powerline extension (Mallee woodland). These vegetation types occur throughout the region. Using the Keighery vegetation scale, Jims Seeds, Weeds & Trees ranked the vegetation condition within the powerline extension area as 'excellent' within the access track and monitoring bore area as 'degraded'. The assessor has viewed photographs of the vegetation proposed to be cleared and considers these descriptions to be accurate.

Seventeen fauna species identified as being of conservation significance by Biota Environmental Services (2006) could be expected within the clearing area. Biota Environmental Services determined that none of those species are likely to be affected by the clearing as these species are able to utilise other vegetation habitats within the region. As the result of the survey, Biota (2006) determined that the fauna assemblages in the local area were typical of what could be expected for the region.

On 17th August 2006, the Biodiversity Coordination Section (BCS) of the Department of Environment and Conservation (DEC) advised that *'although the notified area is within the Lake Cronin Red Book area, known for its high level of flora and fauna diversity and endemism, information contained within supporting documentation provides insufficient evidence to conclude that the notified area comprises a higher level of biological diversity than surrounding areas'* (DEC, 2006a). In this advice, 'notified area' means the proposed clearing area.

Given the above, the proposed clearing may be at variance to this principle due to the risk of introducing weeds.

Methodology

Biota Environmental Services (2006)
CALM (2002)
DEC (2006a)
Jims Seeds, Weeds & Trees (2006)
National Heritage Database (2006)
Shepherd et al (2001a)

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

Comments

Proposal is not likely to be at variance to this Principle

A fauna survey was conducted by Biota Environmental Services in May 2006 in accordance with the EPA Position Statement No. 3 "Terrestrial Biological Surveys as an Element of Biodiversity Protection" (EPA, 2002) and Guidance Statement No. 56 "Terrestrial Fauna Surveys for Environmental Impact Assessments in Western Australia" (EPA, 2004a). This involved trapping over 12 sites, using cage, Elliot and pit traps totalling 850 trap nights, as well as bird observations at the same sites. This survey is the third conducted by Biota Environmental Services over the same area since February 2005. Two sites are located in the immediate vicinity of the proposed clearing area.

As a result of this survey 17 species of conservation significance were identified as either occurring within the study area, or likely to occur within the study area. Those species that were trapped or observed during the survey are detailed below.

Malleefowl (*Leipoa ocellata*) a Schedule 1 (S1) species listed as 'rare or likely to become extinct' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2006* were not observed, although an active nest was located in close proximity to a proposed pipeline route not associated with this clearing permit. It is likely that Malleefowl occur within the proposed clearing area periodically, however, the species has a large area of habitat that it can potentially utilise (Biota Environmental Services, 2006). It is not likely that the proposed clearing will significantly impact on this species.

Carnaby's White Tail Black Cockatoo (*Calyptorhynchus latirostris*) (S1) was not recorded during this survey but was recorded during a survey in November 2005. It is likely that this species occurs in the area occasionally (Biota Environmental Services, 2006). However, due to the large areas of uncleared vegetation in the surrounding area and the lack of suitable nesting hollows it is not likely that this species will be affected by the proposed clearing.

A chuditch (*Dasyurus geoffroyi*) (S1) was trapped during the May 2006 survey. Another chuditch was trapped during the November 2005 survey (Biota Environmental Services, 2006). It would appear that the area supports a population of this species at low densities. The sites where the chuditch have been trapped are not located near the proposed clearing area. Chuditch have large home ranges of up to 15 km and utilise a wide variety of habitats (DEC website, 2006). Therefore, although the species was not trapped near within the proposed clearing area, it could potentially occur there. As the species has a large amount of habitat that it can potentially utilise in the area, it is considered that the proposed clearing of 1.7 hectares is not likely to impact on the population. Western Areas in consultation with DEC have committed to a feral animal control program which should benefit this species.

The Western Rosella (*Platycercus icterotis xanthogenys*) (S1) was not observed during the May 2006 survey but was observed in the previous two surveys. It is thought to be able to utilise a wide range of habitats (Biota Environmental Services, 2006). It is likely to be found throughout the bioregion and its conservation is not likely to be affected by the proposed clearing.

The South West Carpet Python (*Morelia spilota imbricata*) a Schedule 4 (S4) species listed as 'in need of special protection' (S4) under the *Wildlife Conservation (Specially Protected Fauna) Notice 2006* was not observed during the May 2006 survey but was observed during a site inspection in 2004 (Biota Environmental Services, 2006). The species is likely to occur at low densities across a wide range of habitats and therefore its conservation is not likely to be affected by the proposed clearing.

The Shy Groundwren (*Hylacola cauta*) (P4 - Priority 4 under the Wildlife Conservation Act) was observed at most sites and is probably widespread throughout the region in suitable habitat (Biota Environmental Services, 2006). The conservation of this species is not likely to be affected by the proposed clearing.

The Rufous Fieldwren (*Calamanthus campestris montanellus*) (P4) was observed at one site north of the clearing area and is likely to inhabit heath habitat throughout the region (Biota Environmental Services, 2006). The proposed clearing area is partly comprised of heath type habitat, but heath vegetation is extensive throughout the region and therefore the clearing is not likely to affect the conservation of this species.

The Crested Bellbird (*Oreoica gutturalis gutturalis*) (P4) was observed at many sites in the study area (Biota Environmental Services, 2006). This species is common in the region and has been observed at Jaurdi Station over 150 km to the north (pers obs, 2005). Garnett et al (2000) state that the species has been eliminated from much of its former range by clearing. It seems particularly sensitive to subsequent fragmentation. The conservation of this species is not likely to be affected by the proposed clearing because it will not lead to the fragmentation of the existing landscape.

The Brush Wallaby (*Macropus imma*) (P4) was observed from tracks at two sites, one of which is in close proximity to the proposed clearing area (Biota Environmental Services, 2006). However, it is likely to be present in woodland and perhaps mallee habitat which is extensive throughout the region and therefore its conservation is not likely to be affected by the proposed clearing.

The Rainbow Bee-eater (*Merops ornatus*) (Migratory species listed under the EPBC Act) was not observed during the May 2006 survey but was observed during the November 2005 survey (Biota Environmental Services, 2006). It is likely to occur throughout the region where suitable habitat (sandy soils) for nesting is available. The conservation of this species is not likely to be affected by the proposed clearing.

Biota Environmental Services (2006) also identified the following conservation significant species from desktop database searches as potentially occurring within the study area: Red Tailed Phascogale (*Phascogale calura*) (S1), Heath Mouse (*Pseudomys shortridgei*) (S1), Peregrine Falcon (*Falco peregrinus*) (S4), Australian Bustard (*Ardeotis australis*) (P4), Western Shrike-tit (*Falcunculus frontatus leucogaster*) (P4), Western Mouse (*Pseudomys occidentalis*) (P4) and Fork-tailed Swift (*Apus pacificus*) (Migratory Species under the EPBC Act). It is not considered that the proposed clearing would affect the conservation of these species given their known distribution and the large amounts of suitable habitat in the region.

On 17th August 2006, DEC (2006a) advised that 'eight fauna species of conservation significance were recorded during a fauna habitat and fauna assemblage survey of the Forrestania project area in February/March 2005 and November 2005. DEC notes that none of these species have restricted ranges and

that the habitat types present appear to be well represented in the region. It is unlikely that the fauna habitat that is proposed to be cleared would be considered 'significant'. DEC advises that the six recommendations arising from the fauna survey should be set as conditions of the permit (Biota Environmental Services 2006 page 7). However, the recommendations made in Biota Environmental Services report (2006) are not pertinent to the clearing of native vegetation and as such, the use of these recommendations as conditions could be considered *ultra vires*.

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

Methodology Biota Environmental Services (2006).
DEC website (2006)
DEC (2006a)
EPA (2002).
EPA (2004a).

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

Comments Proposal is not likely to be at variance to this Principle

Jims Seeds, Weeds & Trees conducted a baseline flora survey over the proposed clearing area in May 2006. On 17th August 2006, DEC (2006a) has advised that '*although the flora survey of the application area did not identify the presence of conservation significant flora species, the flora survey report was substandard and contrary to claims made by Jims Seeds, Weeds & Trees (2006) (2006a sic)...does not meet the reporting requirements specified by EPA Guidance Statement 51 - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004) (2004a sic)*'.

Subsequently, Jims Seeds, Weeds & Trees have submitted a secondary report (2006b) which DEC advised on the 29th September 2006 (DEC, 2006b) sufficiently meets the requirements of Guidance Statement 51.

As outlined in the secondary report, Jims Seeds, Weeds & Trees undertook a desktop analysis of available rare flora databases and conducted an on-site field survey in May 2006. The desktop analysis identified many rare and priority flora species that potentially occur within the study area. The vegetation type inhabited by each species was obtained from Florabase. These vegetation types were then searched for within the proposed clearing area. If the vegetation type was identified, the area was searched for the presence of threatened flora species. It should be noted that those vegetation types that were less likely to have threatened flora species present were still subject to baseline sampling. The field survey did not identify any rare or priority flora species within the proposed clearing area. It was noted in the report that the survey was not conducted during optimum flowering period, although unseasonal rain earlier in the year meant that many plants were in flower.

Given the above, it is not likely that the proposal is at variance to this principle.

Methodology DEC (2006a)
DEC (2006b)
EPA (2004b)
Jims Seeds, Weeds & Trees (2006a)
Jims Seeds, Weeds & Trees (2006b)

(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

Jims Seeds, Weeds & Trees conducted a baseline flora survey over the proposed clearing area in May 2006. On 17th August 2006, DEC (2006a) advised that '*although the flora survey of the application area did not identify the presence of conservation significant flora species, the flora survey report was substandard and contrary to claims made by Jims Seeds, Weeds & Trees (2006) (2006a sic)...does not meet the reporting requirements specified by EPA Guidance Statement 51 - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004) (2004b sic)*'.

Subsequently, Jims Seeds, Weeds & Trees have submitted a secondary report (2006b) which DEC advised on the 29th September 2006 (DEC, 2006b) sufficiently meets the requirements of Guidance Statement 51.

The field survey identified two vegetation communities being Eucalyptus mallee woodland and Sandplain heath. Neither of these communities are threatened ecological communities. The communities are not an ecological community at risk as described in 'A Biodiversity Audit of WA's 53 Biogeographical Subregions in 2002' (Department of Conservation and Land Management, 2002).

On 17th August 2006 DEC (2006a) advised that '*no Threatened Ecological Communities are known to occur within the notified area*'.

Given the above, it is not likely that the proposal is at variance to this principle.

Methodology DEC (2006a)
 DEC (2006b)
 EPA (2004b)
 CALM (2002)
 Jims Seeds, Weeds & Trees (2006a)
 Jims Seeds, Weeds & Trees (2006b)

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

Comments Proposal is not at variance to this Principle

The proposed clearing area is mapped as Beard Vegetation Associations 511: Medium woodland, salmon gum and morrel, and 2048: Shrublands; scrub heath in the Mallee Region (Shepherd et al, 2001).

	Pre-European area (ha)	Current extent (ha)	Remaining %	Conservation Status	Pre-european % in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Coolgardie	12917718**	12719084**	98.5**	Least Concern***	9.7 (9.9)**
Shire of Kondinin	736570*	369365*	50.1*	Depleted***	Unknown.
Beard veg assoc. (state)					
- 511	464427**	435795**	70.5**	Least Concern***	14.1 (18.9)**
- 2048	4376**	4376**	100**	Least Concern***	3.5 (3.5)**

* Shepherd et al (2001)

** Shepherd et al. (2001a)

***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

Explanation:

At a regional level, the Coolgardie IBRA Region remains at 98.5% of its pre-european vegetation extent. According to the "Bioregional Conservation Status of Ecological Vegetation Classes" (Department of Natural Resources and Environment, 2002), this value gives the region a Conservation Status of "Least Concern".

The proposed clearing area falls within the Kondinin Shire which remains at 50.1% of its pre-european vegetation extent. Kondinin Shire straddles the divide between the intensive land use zone and the largely uncleared extensive land use zone. Given that remaining vegetation within the intensive landuse zone can range from excellent to degraded as ranked using the Keighery vegetation scale (1994), this value should be interpreted as "Depleted" Conservation Status as defined by the "Bioregional Conservation Status of Ecological Vegetation Classes" (Department of Natural Resources and Environment, 2002).

The vegetation associations as described by Beard (511 and 2048) remains at 70.5% and 100% of its pre-european vegetation cover statewide respectively. According to the "Bioregional Conservation Status of Ecological Vegetation Classes" (Department of Natural Resources and Environment, 2002), these values give the vegetation type a Conservation Status of "Least Concern".

As vegetation has remained largely uncleared within the Coolgardie IBRA region, the percentage of vegetation within IUCN reserves has changed little since European settlement.

The removal of 1.7 hectares of native vegetation represents an extremely small fraction of the vegetation remaining in the region and therefore this proposal is not at variance to this principle.

Methodology Department of Natural Resources and Environment (2002)

Keighery (1994)
Shepherd et al (2001)
Shepherd et al (2001a)

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

Comments Proposal is not likely to be at variance to this Principle

A minor watercourse is located immediately east of the proposed clearing area where a water monitoring bore is to be constructed. According to GIS databases the watercourse is described as minor - non-perennial, and terminates within Lake Cronin Nature Reserve. Western Areas have described the drainage line as a poorly defined flood/wash plain area (Western Areas NL, 2006). It is only likely to flow during times of extreme rainfall. Given its usual dry nature, there is little likelihood that the drainage line would contain any vegetation associated with a watercourse. No vegetation types as described by Jims Seeds, Weeds & Trees (2006) are riparian in nature. Vegetation surrounding the proposed clearing area would trap any sediment run-off during extreme rain events.

Given the small area being cleared the proposed clearing is unlikely to alter water table levels.

The proposal is therefore not likely to be at variance to this principle.

Methodology GIS database: Hydrography, Linear - DOE 1/2/04.
Jims Seeds, Weeds & Trees (2006)
Western Areas NL (2006).

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

Comments Proposal is may be at variance to this Principle

The proposed clearing area lies in a very flat area, and has a very insignificant (1%) gradient sloping down to the east (Western Areas NL, 2006). The area experiences an average rainfall of approximately 330-350 mL with Hyden, 80 km east of proposed clearing area, experiencing an average 344.5 mL/y (BOM, 2006) and an annual evaporation rate of 2000 mL/year (Luke et al, 1987). Rainfall can occur at any time during the year but peaks in the winter months at 40-50 mL per month. Therefore there is unlikely to be large amounts of water flowing across the soil surface at any time and water erosion would be minimal. Extensive natural vegetation surrounding the proposed clearing area will act as a buffer to wind erosion.

The proposed clearing area is described by Western Areas (2006) to be either grey clayey soils (powerline), gravelly sand (access track) and grey sandy loam (bore). Grey clays can be prone to waterlogging (DAFWA, 2005). Gravelly sands are described by Schoknecht (2002) as being neutral to acidic and prone to wind erosion in exposed positions. Grey sandy loams are described by Schoknecht (2002) as being neutral and not prone to wind erosion. As Grey clay soils can be prone to waterlogging, Western Areas (email advice from Environmental Officer) have advised that the only clearing that will take place in this area will be where the power poles are located and that there will be some raised blade clearing to allow access to each pole location and vegetation will be slashed down in a ten metre radius from each pole. This will be set as a condition of the permit to ensure soils do not become waterlogged.

Water table levels are measured at 37-55 m below ground (Western Areas NL, 2006), which suggests that salinisation as a result of the removal of 1.7 hectares of vegetation is unlikely.

Given the above, the proposed clearing may be at variance to this principle due to the risk of waterlogging.

Methodology Bureau of Meteorology (2006).
Luke et al (1987).
Schoknecht (2002)
Western Areas NL (2006).

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

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing area is located within the Lake Cronin Red Book Area and at its nearest point the proposed clearing area is 4.6 km from Lake Cronin Nature Reserve and 7.6 km from the lake itself. According to the National Heritage Database (DEH, 2006), the Lake Cronin Red Book Area is significant for rare species due to widespread clearing in the wheatbelt to the west and has a high level of diversity and endemism. Lake Cronin Red Book Area has a high number of disjunct species which is a precursor to subspecies development. Lake Cronin also represents the northern most range of a number of species including frogs and dragons. The Lake Cronin Red Book Area lies at an intersection of several biogeographic regions and therefore is considered to be species rich, with representations from each region.

However, the Lake Cronin Red Book Area lies within the extensive land use zone, an area east of the wheatbelt that has remained largely uncleared. The vegetation communities present within the proposed clearing area are well represented throughout the region.

On 17th August 2006 DEC (2006a) advised that "*Lake Cronin Nature Reserve is sufficiently distanced from the notified area that its conservation values are unlikely to be impacted by this work. Supporting documentation states that 'WSA have set up permanent vegetation monitoring plots inside M77/582 to ensure that mining operations have no impacts on vegetation upstream of Lake Cronin'*". In this advice 'WSA' means Western Areas NL and 'notified area' means the proposed clearing area.

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

Methodology DEC (2006a)
DEH (2006)

(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 proposed clearing straddles the Swan Avon/Lockhart and Swan Avon/Yilgarn catchments, neither of which are Public Drinking Water Source Areas. The area receives ~344.6 mL/y (BOM, 2006) and experiences a pan evaporation rate of 2200 mm/y (Luke et al, 1987). Surface water flow is likely to be low during normal seasonal rains. Sedimentation or turbidity of waterbodies is not likely as there are no permanent water bodies in the clearing area or near vicinity. A slope of 1.5% to the south is considered minor and the minimal surface water flow during normal rains is not likely to cause erosion problems. A saline to hypersaline (15000 - 35000 TDS) water table located 40-60 m below the surface (Western Areas NL, 2006) is not likely to be affected by the clearing. No vegetation is likely to be dependant on groundwater at such depths and the clearing is not likely to alter groundwater table levels.

Given the above, this proposal is not likely to be at variance with this principle.

Methodology BOM (2006)
Luke et al (1987)
Western Areas NL (2006)

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

Comments Proposal is not likely to be at variance to this Principle

Low annual rainfall (344 mL/y) (BOM, 2006), high evaporation rates (2200 mm/y) (Luke et al, 2006) and a gentle downward slope of 1% to the east (Western Areas NL, 2006) would suggest that this area is not subject to flooding. Given the small area being cleared it is unlikely that the proposal will lead to an increase in flooding peaks or intensity.

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

Methodology BOM (2006)
Luke et al (1987)
Western Areas NL (2006)

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

Comments

There are no registered native title claims (GIS database) and no known Aboriginal Sites of Significance (GIS database) that within the proposed clearing area.

Under a current Memorandum of Understanding between DoIR and EPA, where a mineral exploration proposal occurs within a red book area, DoIR will seek advice from DEC as to whether the proposal should be referred to the EPA. Western Areas referred a previous clearing application (CPS 1249) to the EPA, and the level of assessment was set as 'not assessed - managed under Part V of the *Environmental Protection Act, 1986*. This clearing application is located within the same tenements (M77/545 and M77/912) as CPS 1249. The assessing officer does not consider that there are significant differences from a biodiversity point of view between this application and CPS 1249. The assessing officer has therefore, not referred the proposal to the EPA.

There are no groundwater/surface water licenses nor Environmental License/Works Approval current for these tenements (DEC, 2006c).

Methodology GIS database: Native Title Claims - DLI 7/11/05
GIS database: Aboriginal Sites of Significance - DIA.

4. Assessor's recommendations

Purpose	Method Applied	Area (ha)/ trees	Decision	Comment / recommendation
Mineral Exploration	Mechanical Removal	1.7	Grant	<p>The proposed clearing may be at variance to principle a and g, and is not likely to be at variance to principle b, c, d, e, f, h, i and j. The assessing officer recommends that the permit be granted subject to the following conditions:</p> <ol style="list-style-type: none">1. The Permit Holder shall record the following for each instance of clearing:<ol style="list-style-type: none">(i) the coordinates of areas cleared using Geocentric Datum Australia 1994;(ii) the size of the area cleared in hectares; and(iii) the dates on which the area was cleared.2. The Permit holder shall slash vegetation or use raised blade clearing for power pole access, installation and maintenance, within the area cross hatched red on attached Plan 1418/1b.3. When undertaking any clearing, revegetation and rehabilitation, or other activity pursuant to this Permit the Permit Holder must take the following steps to minimise the risk of the introduction and spread of weeds:<ol style="list-style-type: none">(i) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;(ii) ensure that no weed-affected road building materials, mulch, fill or other material is brought into the area to be cleared; and(iii) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.4. The Permit Holder shall provide a report to the Director, Environment, Department of Industry and Resources by 1 February each year for the life of this permit setting out the records required under condition 1 of this permit in relation to clearing carried out between 1 January and 31 December of the previous year.

5. References

- Biota Environmental Services (2006). Forresteria Fauna Monitoring Interim Summary Report, May 3rd to 9th, 2006. Unpublished report provided to Western Areas NL, dated 16 June 2006. Perth, Western Australia.
- Bureau of Meteorology website (2006) http://www.bom.gov.au/climate/averages/tables/cw_010568.shtml
- DEC (2006a) Clearing Assessment Unit's biodiversity advice for land clearing application, 17th August 2006. Advice to Assessing Officer, Department of Industry and Resources (DOIR). Department of Environment and Conservation (DEC), Western Australia.
- DEC (2006b) Clearing Assessment Unit's biodiversity advice for land clearing application, 29th September 2006. Advice to Assessing Officer, Department of Industry and Resources (DOIR). Department of Environment and Conservation (DEC), Western Australia.
- DEC (2006c). Water Allocation/License Advice. Advice to Assessing Officer, DOIR. Department of Environment and Conservation, Western Australia.
- Department of Agriculture and Food Western Australia (2005). Managing Grey Clays To Maximise Production and Sustainability. Revised Edition.
- Department of Environment and Conservation Website (2006). www.naturebase.net/plants_animals/pdf_files/sp_chuditch.pdf
- Department of Environment and Heritage (Australian Heritage Database) Website <http://www.deh.gov.au/cgi-bin/ahdb/search.pl>
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6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

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

P1	Priority One - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	Priority Two - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	Priority Three - Poorly Known taxa: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	Priority Four – Rare taxa: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable): taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X	Declared Rare Flora - Presumed Extinct taxa: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

Schedule 1	Schedule 1 – Fauna that is rare or likely to become extinct: being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
Schedule 2	Schedule 2 – Fauna that is presumed to be extinct: being fauna that is presumed to be extinct, are

declared to be fauna that is need of special protection.

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

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

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

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

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

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.