Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2057/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Newmont Yandal Operations Pty Ltd**

1.3. Property details

Property: Mining Lease 53/237
Local Government Area: Shire of Wiluna
Colloquial name: Desert Dragon Project

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
The area applied to clear has been broadly mapped at a scale of 1:250000 as: Beard Vegetation Association 18: Low woodland; Mulga (*Acacia aneura*) and Beard Vegetation Association 107: Hummock grasslands, shrub steppe; Mulga and *Eucalyptus kingsmillii* over hard spinifex (GIS Database). Botanica Consulting (2007) undertook a flora and vegetation survey of the proposed clearing area on the 29th and 30th March 2007. The following vegetation communities were mapped within the proposed clearing area: 1. Mulga Woodland: Upperstorey of *Acacia aneura*, *A. craspedocarpa* and *A. jamesiana*. Understorey of *Ptilotus obovatus*, *P. schwartzii*, *Senna artemisioides subsp. filifolia*, *Maireana georgei*, *Acacia tetragonophylla*, *Eremophila forrestii*, *E. gilesii subsp. gilesii ms*, *E. longifolia*, *E. oldfieldii subsp. angustifolia*, *Psydrax latifolia* and *Solanum lasiophyllum*; and 2. Mulga Sandplain: Upper storey of *Eucalyptus gonglyocarpa* and *Acacia aneura subsp. aneura*. Understorey of *Disphyma crassifolium*, *Ptilotus obovatus*, *Halgania cyana var Allabi Station*, *Petalostilis cassiodes*, *Scaevola spinescens*, *Eremophila battii*, *E. forrestii*, *E. platythamnos subsp. platythamnos*, *E. spectabilis*, *Leptosema chambersii*, *Triodia mevilleii* and *Keraudrenia velutina subsp. elliptica*.	This clearing permit application is for a Purpose Permit to clear up to 94 hectares of native vegetation within a boundary of approximately 131 hectares (GIS Database). The proposed clearing area is located approximately 50 kilometres north-east of the Wiluna township (Keith Lindbeck and Associates, 2007). The proposed clearing will allow the proponent to develop the Desert Dragon Mining Project, currently planned to consist of four small open cut pits, associated waste dump, ore pad, workshops and office area (Keith Lindbeck and Associates, 2007). A haul road (14 kilometres in length) will be constructed from the Desert Dragon project area to allow ore to be trucked south to the existing Jundee mill for processing. However, this clearing permit application will only cover a 4 kilometre section of the proposed haul road. It should be noted that the haul road construction will involve expansion of an existing track, thus minimising disturbance to native vegetation.	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	The proposed clearing area is located on the Jundee pastoral lease (GIS Database). Disturbance within the proposed clearing area is in the form of historic access tracks, exploration drilling and grazing (Botanica Consulting, 2007). The vegetation condition rating is based on the flora and vegetation survey undertaken by Botanica Consulting (2007).

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 approximately 50 kilometres north-east of Wiluna in the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Eastern Murchison subregion is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development (CALM, 2001). Vegetation of the subregion is dominated by Mulga woodlands (often rich in ephemerals), hummock grasslands, saltbush shrublands and Halosarcia shrublands (CALM, 2001). Pastoral grazing occurs over a vast majority of the subregion, and consequently, much of the subregion has been severely degraded by feral herbivores. Mining for gold and nickel in the region is considerable, with most mining tenements occurring on pastoral land (CALM, 2001).

Botanica Consulting (2007) recorded two vegetation communities within the Desert Dragon project area: Mulga woodlands; and Mulga sandplains. These vegetation communities are common and widespread in the Northern Goldfields. No unique vegetation, landform or habitat types were recorded within the Desert Dragon project area (Botanica Consulting, 2007). No Declared Rare Flora (DRF) or Priority Flora species were recorded (Botanica Consulting, 2007). It is therefore concluded that the proposed vegetation clearing is not likely to have a significant impact upon biodiversity from a floristic point of view.

Biodiversity values of the proposed clearing area have been diminished somewhat by previous mineral exploration activities. In addition, it should be noted that the area applied to clear is part of the Jundee pastoral station. Consequently, feral herbivores such as cattle and goats have had noticeable impacts upon the native vegetation in some areas, as assessed by Coffey Environments (2008).

From a faunal perspective, three habitat types (Mulga woodland, spinifex sandplain and Mulga over spinifex) common to the Northern Goldfields were recorded from the proposed clearing area (Coffey Environments, 2008). Species richness and abundance is likely to be similar to other areas in the region (Coffey Environments, 2008).

The fauna values of the site are likely to be impacted by feral cats (*Felis catus*) which are regularly seen at the nearby Jundee mine site (cat tracks were also recorded by Coffey Environments (2008) within the Desert Dragon project area). The House Mouse (*Mus musculus*) and Fox (*Vulpes vulpes*) have been recorded from previous fauna surveys undertaken in the surrounding area. The proponent has an informal cat trapping program in place to control feral cats at Jundee mine site. It is recommended that this program continue, in conjunction with other concerted efforts to control feral animals in and around the Jundee mine site (Coffey Environments, 2008).

An important biodiversity value of the Desert Dragon project area may exist at the fauna species level. The Mulgara (*Dasycercus cristicauda*) is a small mammal listed as Schedule 1 - 'Fauna that is rare or likely to become extinct' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2006* and 'Vulnerable' under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*). The fauna assessment undertaken by Coffey Environments (2008) concluded that the Mulgara is likely to occur in the proposed clearing area, and if present, is likely to be significantly impacted by vegetation clearing should adequate management measures not be put in place.

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

Should a clearing permit be granted, it is recommended that suitable conditions be imposed on the permit for the purposes of mitigating the potential impact of land clearing on the Mulgara.

Methodology

Botanica Consulting (2007).
CALM (2001).
Coffey Environments (2008).
GIS Database:
- Interim Biogeographic Regionalisation for Australia (Subregions) - EA - 18/10/00.

(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 may be at variance to this Principle

Coffey Environments (2008) undertook a level 1 fauna assessment of the Desert Dragon project area, in accordance with Environmental Protection Authority (EPA) Position Statement No. 3 "Terrestrial Biological Surveys as an Element of Biodiversity Protection" and Statement No.56 "Guidance for the Assessment of Environmental Factors: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia" (EPA, 2002; 2004). The fauna assessment consisted of two components:

1. Desktop Study - Database searches were undertaken of the Western Australian Museum's 'FaunaBase', the Department of Environment and Conservation's (DEC's) 'Threatened and Priority Species' database, and the Department of Environment and Water Resources' '*EPBC Act 1999'* online database. The purpose of the

database searches was to compile a list of birds, mammals, reptiles and amphibians likely to occur in the project area. Information from reputable scientific literature was also used to compliment the database searches, whilst a number of other fauna surveys undertaken around the Jundee mine site and surrounding area were consulted; and

2. Reconnaissance Survey - On the 17th and 18th of September 2007, Coffey Environments (2008) visited the Desert Dragon project area to identify fauna habitats and assess the potential for conservation significant species to occur in the project area. Grid searching was undertaken on foot at 5 - 10 metre intervals in all habitats assessed as being likely to support conservation significant fauna. The purpose of grid searching was to look for evidence (scats, tracks, burrows) of conservation significant fauna species.

Coffey Environments (2008) identified three main habitat types within the Desert Dragon project area. These were:

1. Spinifex sandplains;
2. Mulga over spinifex; and
3. Mulga woodlands.

Of the main habitats identified, Coffey Environments (2008) concluded that the spinifex sandplain habitat was the most diverse, and the Mulga woodlands the least diverse. Coffey Environments (2008) reported that the Desert Dragon project area does not contain any unique fauna habitats or assemblages. It was also noted that some areas of vegetation within the proposed clearing area had been significantly degraded by mineral exploration activity. Whilst the level 1 fauna survey was not able to assess species richness of the project area, it was concluded, based on habitat types, that the Desert Dragon project area would have a species richness and abundance considered typical of the Northern Goldfields (Coffey Environments, 2008).

Notwithstanding this, Coffey Environments (2008) did note that the Mulgara; *Dasycercus cristicauda* (listed as Schedule 1 - 'Fauna that is rare or likely to become extinct' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2006* and 'Vulnerable' under the *EPBC Act 1999*) is likely to occur in the Desert Dragon project area and will be significantly impacted by the proposed clearing should adequate management measures not be put in place.

The Mulgara is a small mammal which inhabits arid regions of Australia, typically residing in spinifex on sandy soils (Coffey Environments, 2008). This species has been recorded from numerous locations within the Northern Goldfields in Western Australia, typically in red sandplain country vegetated with spinifex. The Mulgara has previously been recorded from the Jundee mine site and numerous locations to the south of the Desert Dragon project area, including Yakabindie, Six Mile Well, Mt Keith, Lake Way and south Lake Way (Coffey Environments, 2008). Other recorded locations of Mulgara in the general vicinity of the Jundee mine site include Lorna Glen Station, Marymia and Marsmia Stations, Wanjarri Nature Reserve and Plutonic Gold Mine (Coffey Environments, 2008).

During the two-day reconnaissance survey of the Desert Dragon project area, one inactive burrow of the Mulgara was recorded under a Triodia sp. tussock grassland. No active burrows, fresh tracks or scats were recorded (Coffey Environments, 2008). It must be acknowledged that burrows are very difficult to locate and are often found underneath spinifex grass. Tracks could not realistically be detected as weather conditions were windy overnight (Coffey Environments, 2008).

Coffey Environments (2008) concluded that the Mulgara is likely to occur in the proposed clearing area on the basis of the following:

- approximately 20 - 30 hectares of suitable habitat is present;
- one inactive burrow was located within suitable habitat within the proposed clearing area; and
- Mulgara have previously been recorded from other areas of the Jundee mine site (within 10 kilometres of the Desert Dragon project area).

Should a clearing permit be granted, Coffey Environments (2008) recommend that a trapping and relocation program be undertaken for the Mulgara within suitable habitat proposed to clear. Trapping should be undertaken over a minimum of seven nights, using more than 500 Elliot traps. Trapping should take place within three weeks of the proposed clearing to minimise the opportunities of individuals recolonising the area (Coffey Environments, 2008). In addition, Coffey Environments' senior zoologist provided advice to the assessing officer, DoIR, advising that all Mulgara burrows within suitable habitat in the proposed clearing area should be excavated and closed out following the trapping program in order to discourage Mulgara recolonising the area prior to clearing. This will minimise the risk of Mulgara facing mortality during the clearing operations.

A range of other conservation significant fauna species have been deemed 'likely to occur' or 'may occur' in the proposed clearing area as occasional visitors, migratory species or regular inhabitants (Coffey Environments, 2008). Given that habitat within the proposed clearing area is well represented on a regional basis, Coffey Environments (2008) concluded that with the exception of the Mulgara, no species of conservation significance are likely to be significantly impacted by the proposed clearing.

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

Should a clearing permit be granted, it is recommended that suitable conditions be imposed on the permit for

the purposes of mitigating the potential impact of land clearing on the Mulgara.

Methodology Coffey Environments (2008).
EPA (2002).
EPA (2004).

(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

There are no known records of Declared Rare Flora (DRF) within the proposed clearing area (GIS Database). A combined search of the DEC's Declared Rare and Priority Flora database and the Western Australian Herbarium databases was undertaken for flora species recorded within grid coordinates (GDA94 51 J 209575 7126635 and 51 J 337912 7014362). This search covered an area of approximately 1,440,878 hectares (including the proposed clearing area). No DRF species were recorded for this search area (Botanica Consulting, 2007). Botanica Consulting (2007) undertook a flora and vegetation survey of the proposed clearing area between 29th and 30th March 2007 and did not record any DRF species. It is therefore unlikely that the proposed clearing will impact upon any DRF species.

There are no known records of Priority Flora within the proposed clearing area (GIS Database). Thirteen Priority Flora species were recorded in a combined search of the DEC's Declared Rare and Priority Flora database and the Western Australian Herbarium databases within grid coordinates (GDA94 51 J 209575 7126635 and 51 J 337912 7014362) (Botanica Consulting, 2007). Prior to undertaking a field survey of the proposed clearing area, Botanica Consulting (2007) viewed the Western Australian Herbarium's Florabase web page in order to become familiar with these 13 Priority species. No Priority Flora species were recorded within the proposed clearing area during a two day flora and vegetation survey (Botanica Consulting, 2007). It is therefore unlikely that the proposed clearing will impact upon any Priority Flora species.

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

Methodology Botanica Consulting (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 Threatened Ecological Communities (TECs) within, or in close proximity to, the clearing permit application area (GIS Database). There are no known TECs in the Eastern Murchison subregion (CALM, 2001). The nearest known TEC is approximately 185 kilometres south-south west of the proposed clearing area (GIS Database).

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

Methodology CALM (2001).
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 at variance to this Principle

The area applied to clear is within the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). According to Shepherd et al (2001) there is approximately 100% of the pre-European vegetation remaining in the Murchison bioregion.

The vegetation of the application area is classified as Beard Vegetation Association 18: Low woodland; Mulga (*Acacia aneura*) and Beard Vegetation Association 107: Hummock grasslands, shrub steppe; Mulga and *Eucalyptus kingsmillii* over hard spinifex (GIS Database). There is approximately 100% of the pre-European vegetation remaining of both Beard Vegetation Associations 18 and 107 in the Murchison bioregion (Shepherd et al, 2001). Whilst Beard Vegetation Associations 18 and 107 are not well represented in conservation reserves within the Murchison bioregion, the area proposed to clear does not represent a significant remnant of vegetation in the wider regional area. The proposed clearing will not reduce the extent of Beard Vegetation Associations 18 or 107 below current recognised threshold levels, below which species loss increases significantly.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Murchison	28,120,558	28,120,558	~100	least concern	1.1
Beard veg assoc. – State					
18	19,892,437	19,890,348	~100	least concern	2.1
107	2,815,399	2,815,399	~100	least concern	1.7
Beard veg assoc. – Bioregion					
18	12,403,248	12,403,248	~100	least concern	0.4
107	2,792,397	2,792,397	~100	least concern	1.7

* Shepherd et al. (2001) updated 2005
** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002).
Shepherd et al (2001).
GIS Databases:
- 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 is not at variance to this Principle

There are no permanent or ephemeral watercourses or wetlands within the proposed clearing area (GIS Database; Keith Lindbeck and Associates, 2007). No distinctive riparian vegetation associations were mapped by Botanica Consulting (2007) during a flora and vegetation survey of the proposed clearing area on the 29th and 30th March 2007.

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

Methodology Botancia Consulting (2007).
Keith Lindbeck and Associates (2007).
GIS Database:
- Hydrography, linear - DOE 01/02/04.

(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 proposed clearing area is within the Bullimore land system, as mapped by Curry et al. (1994). This land system is characterised by gently undulating sandplains with occasional linear dunes supporting tall Mallee-Acacia shrublands and hard spinifex. Drainage features are uncommon in this land system and relief is up to 10 metres (Curry et al, 1994). The land system is typically characterised by red clayey sands, red earths and red sands in dunes. An outstanding feature of soils in this area is their leached nature and the widespread siliceous hardpan (Keith Lindbeck and Associates, 2007). The Bullimore land system is not generally susceptible to erosion (Curry et al, 1994). The land system description provided by Curry et al (1994) is consistent with the Mulga sandplain country encountered by Botanica Consulting (2007) during a flora and vegetation survey of the proposed clearing area.

The area proposed to be cleared is flat sandplain country where there is little surface water flow during normal seasonal rains. The potential for water erosion and water logging is therefore minimal (Keith Lindbeck and Associates, 2007). Notwithstanding this, heavy rains are experienced in some years when anticyclones move eastwards with tropical cyclones (Keith Lindbeck and Associates, 2007). Should intense rainfall events follow vegetation clearing, there may be some potential for water erosion. Intense rainfall may also lead to localised waterlogging in some areas (particularly where siliceous hardpans exist).

With respect to wind erosion, vegetation clearing will be undertaken in a staged approach to ensure that large tracts of land are not opened up ahead of the mining schedule (Keith Lindbeck and Associates, 2007). Topsoil and vegetation removed during clearing operations will be stockpiled for later use in rehabilitation. All cleared areas (except the open pits) will be progressively rehabilitated as soon as practicable using local native plant species (Keith Lindbeck and Associates, 2007).

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

Methodology Botanica Consulting (2007).
Curry et al. (1994).
Keith Lindbeck and Associates (2007).
GIS Database:
- Rangeland Land System Mapping - DA.

(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**
There are no conservation reserves in close proximity to the proposed clearing area (GIS Database). The proposed Lorna Glen conservation reserve is located approximately 50 kilometres to the east (Keith Lindbeck and Associates, 2007). At present, the nearest conservation reserve is the Wanjarri Nature Reserve, located approximately 110 kilometres south of the proposed clearing area (GIS Database).

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

Methodology Keith Lindbeck and Associates (2007).
GIS Database:
- CALM Managed Lands and Waters - CALM 01/07/05.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments **Proposal is not likely to be at variance to this Principle**
The area proposed to be cleared is not within a Public Drinking Water Source Area (GIS Database). There are no permanent or ephemeral watercourses or wetlands within the proposed clearing area (GIS Database; Keith Lindbeck and Associates, 2007). Given the average annual rainfall (258.9 millimetres) and average annual evaporation rate (3,450 millimetres), there is little surface water flow during normal seasonal rains (Keith Lindbeck and Associates, 2007). It is therefore unlikely that the proposed clearing will impact upon surface water quality onsite or offsite.

No studies have been undertaken to determine the impact of vegetation removal on groundwater levels or quality. The natural groundwater of the region is considered brackish. Given the low average annual rainfall and high average annual evaporation rate, recharge to the groundwater table is expected to be low (Keith Lindbeck and Associates, 2007). It is not expected that the proposed vegetation clearing will have significant detrimental impacts upon groundwater levels or quality.

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

Methodology Keith Lindbeck and Associates (2007).
GIS Database:
- Hydrography, linear - DOE 01/02/04.
- Public Drinking Water Source Areas (PDWSAs) - DOE 28/04/05.

(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 average annual rainfall of Wiluna (the closest meteorological recording station to the proposed clearing area) is 258.9 millimetres (Keith Lindbeck and Associates, 2007). Average annual evaporation is 3,450 millimetres (Keith Lindbeck and Associates, 2007). Heavy rainfall does occur on occasion, and is typically associated with anticyclones and tropical cyclones moving eastwards (Keith Lindbeck and Associates, 2007). Natural flood events are only likely following such cyclonic activity.

Given that there are no watercourses within the proposed clearing area, it is unlikely that flood events will be experienced (Keith Lindbeck and Associates, 2007). The proposed vegetation removal is not likely to exacerbate the incidence or intensity of natural flood events.

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

Methodology Keith Lindbeck and Associates (2007).

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

Comments

There is one native title claim over the area under application (GIS Database). This claim (WC99/024) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). However, the mining tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the

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

There are no registered Sites of Aboriginal Significance within the area applied to clear (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.

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

Methodology

GIS Databases:
- Aboriginal Sites of Significance - DIA 04/07/02.
- Native Title Claims - DLI 19/12/04.

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Production	Mechanical Removal	94	The Clearing Principles have been addressed and the proposed clearing may be at variance to Principles (a) and (b), is not likely to be at variance to Principles (c), (d), (g), (h), (i) or (j), and is not at variance to Principles (e) and (f). Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of managing the Mulgara, rehabilitation, record keeping and permit reporting.

5. References

Botanica Consulting (2007) Flora and Vegetation Survey of Desert Dragon and related Haul Road. For Newmont Mining Corporation. March 2007.

CALM (2001) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Murchison 1 (MUR 1 - East Murchison subregion).

Coffey Environments (2008) Level 1 Fauna Assessment, Desert Dragon, Jundee Gold Operations.

Curry, P.J., Payne, A.L., Leighton, K.A., Hennig, P. & Blood, D.A (1994) Technical Bulletin No. 84: An inventory and condition survey of the Murchison River catchment and surrounds, Western Australia. Department of Agriculture Western Australia, South Perth, Western Australia.

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

EPA (2002) Terrestrial Biological Surveys as an element of biodiversity protection. Position Statement No. 3. March 2002. Environmental Protection Authority.

EPA (2004) Guidance for the Assessment of Environmental Factors - terrestrial fauna for Environmental Impact Assessment in Western Australia. Report by the EPA under the Environmental Protection Act 1986. No 56 WA.

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Keith Lindbeck and Associates (2007) Newmont Jundee Operations: Supporting Document for Clearing Permit Application – Desert Dragon Project (M53/237). Prepared for Newmont Jundee Operations.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia (updated 2005).

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.

DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
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.