Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2235/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**

1.3. Property details

Property: State Agreement Lease Area 4SA (AML70/4)
Local Government Area: Shire Of Ashburton
Colloquial name: Mt Tom Price Iron Ore Mine Southern Ridge Waste Dump

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
43		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

Beard vegetation associations have been mapped at a 1:250 000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Two Beard vegetation associations are located within the application area (GIS Database):

162 - Shrublands; snakewood scrub. According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 162 is a shrubland dominated by *Acacia xiphophylla*, with sub-dominants of *A. aneura*, *A. victoriae*, *Senna glutinosa ssp. charlesiana* over *Triodia longiceps* and *Maireana melanocoma*.

567 - Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *T. basedowii*. According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 567 is a shrubland dominated by *Acacia aneura*, with sub-dominants of *Senna sp.*, *A. pruinocarpa*, *A. xiphophylla* and *Eremophila sp*.

Keith Lindbeck and Associates (hereafter referred to as KLA) conducted a vegetation survey over the application area and surrounding vegetation in October 2007. As a result, KLA identified four vegetation types occurring within the application area (KLA, 2007). These are:

H9-3 Undulating upland platform. *Acacia aneura* low closed forest over *Eremophila spp*. shrubland over *Triodia wiseana* and *T. angusta* hummock grassland (Small mulga patch).

P4-2 Undulating Plains. *Corymbia hamersleyana* and *Eucalyptus leucophloia* scattered trees over *Acacia bivenosa* open scrub over *Triodia wiseana* hummock grassland.

P4-3 Undulating Plains. *Eucalyptus leucophloia* and *Acacia aneura* low open woodland over scattered high open scrubland over *Triodia wiseana* hummock grassland.

W2-1 Broad Ephemeral Creek. *Acacia aneura*, *A. pruinocarpa* and *A. citrinoviridis* low open forest over low open shrubland over *Triodia epactia* hummock grassland.

Clearing Description

Hamersley Iron Pty Ltd (hereafter referred to as Hamersley Iron) have applied to clear up to 43 hectares to extend a waste dump. Hamersley Iron will be using mechanical means to clear the vegetation. Mt Tom Price Iron Ore Mine is located approximately 10 km south of Tom Price.

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)

Comment

Vegetation within the application area was described as good (KLA, 2007). Following a site inspection the assessing officer considers the vegetation condition to be 'very good' according to the Keighery scale (Keighery, 1994). KLA (2007) stated that some areas of vegetation had been previously burnt in the last 2-5 years, but that regrowth was very good following a good wet season in 2006.

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 application area occurs within the Hamersley Iron (PIL3) IBRA Sub-Bioregion (GIS Database). This sub-bioregion is characterised by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002). The vegetation described within the application area (KLA, 2007) is typical of the bioregion.

Vegetation surveys of the application area and surrounding vegetation (total area surveyed - 17.2 km2) identified 295 flora species from 49 Families (KLA, 2007). This is considered to be biologically diverse. It is noted by the assessing officer that approximately 35% of the area surveyed was cleared. Poacae, Malvacae, Mimosaceae, Asteraceae, Papilionaceae, Amaranthaceae, and Myoporaceae families are particularly diverse within the application area (KLA, 2007). This is typical of the floristics of the Pilbara IBRA Region.

An area search of the Western Australian Museum's Faunabase conducted by the assessing officer suggests that the application area is diverse in reptile species, particularly Skinks and Geckos (Western Australian Museum, 2008).The search found 63 species from 9 Families as potentially occurring within the application area, or within 50 km of the application area. 53 avian fauna species from 23 Families have also been recorded within 50 km of the application area, reflecting the diverse range of habitats available.

Five alien weed species were recorded within the vegetation survey area (KLA, 2007). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity through repeated fires. No major infestations were observed. It is not expected that the clearing of vegetation will lead to an infestation of weeds within the application area or surrounding vegetation.

Although the application areas are high in floral and faunal diversity, they are not likely to have greater diversity than similar areas within the region.

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

Methodology

CALM (2002)
KLA (2007)
Western Australian Museum (2008)
GIS Database:
- Interim Biogeographic Regionalisation of 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 is not likely to be at variance to this Principle

The assessing officer has conducted a search of the Western Australian Museum's online fauna database between the coordinates 117.5°, 22.5° and 118.1°, 23.1°, representing a 50 km radius around the application area.

This search identified 6 Amphibian, 53 Avian, 21 Mammalian and 63 Reptilian species (Western Australian Museum, 2008). Of these, the following species of conservation significance have previously been recorded within the search area: Striated Grasswren (*Amytornis striatus striatus*), Night Parrot (*Pezoporus occidentalis*), Long-tailed Dunnart (*Sminthopsis longicaudata*), Orange Leaf-nosed Bat (*Rhinonicteris aurantius*), Lakeland Downs Mouse (*Leggadina lakedownensis*), Pebble-mound Mouse (*Pseudomys chapmani*) and Pilbara Olive Python (*Liasis olivaceus barroni*).

KLA conducted a desktop search of the DEC's Threatened Fauna Database and the Department of Environment and Water Resources "Protected Matters Search Tool. In addition to those species of conservation significance listed above, this search identified the following species within the search area (KLA, 2007): Peregrine Falcon (*Falco peregrinus*), Australian Bustard (*Ardeotis australis*), Northern Quoll (*Dasyurus hallucatus*), and Rainbow Bee-eater (*Merops ornatus*). The search also identified a range of migratory marine and wetland bird species. However, it is unlikely that the proposed clearing will impact on these migratory species.

The Northern Quoll (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) is known to occur in a range of habitats, including *Eucalyptus* open forest, monsoon rainforest and savannah woodland, but is most abundant (and apparently with less fluctuation) in rocky environments close to free water in creekline areas (Braithwaite et al, 1994). It has undergone substantial decline in the Pilbara and is now known to occur in geographically isolated populations (Firestone, 1999). Whilst a small rockpile exists within the application area, the absence of available water suggests that the vegetation within the application area is not significant habitat for this species.

The Orange Leaf-nosed Bat (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation*

(Specially Protected Fauna) Notice, 2006) is described as preferring warm humid caves for roosting, although some have been found in tree hollows (Australian Museum Online, 2007a). They are known to hunt flying prey close to roosts, and glean from foliage and the ground in riparian vegetation in gorges, and in open hummock grasslands and sparse tree and shrub savannah (Department of Environment and Water Resources, 2007a). Known colonies in the Pilbara occupy abandoned, deep and partially flooded mines that trap pockets of warm, humid air in the mine's constant temperature zone. For at least part of the year, the species is thought to also occupy smaller, less complex mines nearby. There are no known natural roosting sites in the Pilbara (Department of Environment and Water Resources, 2007a). There are no abandoned mine shafts of substantial caves within the application area. Therefore, the vegetation within the application area is not significant habitat for this species.

The Night Parrot (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) is a very seldom seen bird that occupies dense, low vegetation, which provides them shelter during the day (Australian Museum Online, 2007b). Most records come from hummock grasslands with spinifex (porcupine grass, *Triodia sp.*), or from areas dominated by samphire. It has been suggested that birds move into the grasslands when *Triodia* is seeding (Australian Museum Online, 2007b). They have also been reported in low chenopod shrublands comprising saltbush and bluebush, and from areas of Mitchell grass, *Astrebla sp.* with scattered chenopods (Australian Museum Online, 2007b). Many records have come from waterholes, and almost all reports from areas of *Triodia* have noted the presence of nearby water (Australian Museum Online, 2007b). As this species is very rare, and little is known of its distribution, it is difficult for the assessing officer to determine what impact, if any, the proposed clearing will have on this species. However, given the lack of permanent water in the application areas, it is unlikely that the vegetation to be cleared represents significant habitat for this species.

The Pilbara Olive Python (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) prefers deep gorges and water holes in the ranges of the Pilbara region (Pearson, 1993 in Department of Environment and Water Resources, 2007b). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops (Pearson, 2001, in Department of Environment and Water Resources, 2007b). The application area does not provide habitat for this species.

The Rainbow Bee-eater (Migratory species under the *Environmental Protection and Biodiversity Conservation Act, 1996*) is able to utilise a wide range of habitat types and nests in sandy soils. It is likely to utilise the application areas for feeding, but are unlikely to utilise the area for nesting due to the absence of sandy soils. Given the vast area of the Pilbara IBRA Bioregion and the species ability to utilise a wide range of habitats, it is unlikely that the vegetation within the application areas is significant habitat for this species.

The Peregrine Falcon (Schedule 4 - Other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) is known to inhabit most areas in Australia and utilise cliffs, tall trees and granite outcrops for nesting (Australian Museum Online, 2007c). The Peregrine Falcon is likely to occur sporadically within the application area, but is not likely to nest in the area due to an absence of tall trees or rocky outcrops. Therefore, the vegetation within the application area is not significant habitat for this species.

The Western Pebble-mound Mouse (DEC - Priority 4) is described as constructing pebble mounds on slopes composed of stony soils, near sharply incised drainage lines (Start et al, 2000). Mounds are built in vegetation dominated by hard spinifex (*Triodia basedowii* or *T. wiseana*) (Start et al, 2000). Pebble mounds were observed at several locations but not in dense colonies (Hamersley Iron, 2007). The vegetation within the application area may be significant habitat for this species, although the species is found in many locations within the Hamersley Iron ranges, including Karijini National Park.

The Lakeland Downs Mouse (DEC - Priority 4) is known to occur on sandy soils and cracking clays that support native grasses (DEC, 2006). It is known that this species experiences great fluctuations in population size depending on seasonal factors, reaching plague proportions in good years (DEC, 2006). The soil types located within the application area appear to be gravelly stony soils and therefore the area may not be ideal habitat for this species. Therefore, it is unlikely that the vegetation to be cleared is significant habitat for this species.

The Long-tailed Dunnart (DEC Priority 4) occur in rugged rocky landscapes that support a low open woodland or shrubland of Acacia's (especially Mulga) with an understorey of spinifex hummocks, and (occasionally) also perennial grasses and Cassias from the Pilbara and upper Gascoyne region in the West (DNREA, 2007). They have also more recently been recorded from plateaus near breakaways and screes and rugged boulder strewn screes in the Goldfields region. The habitat types found within the application area may support populations of Long-tailed Dunnart. However, it is unlikely that the vegetation to be cleared represents significant habitat for this species, given its widespread distribution.

The Australian Bustard (DEC Priority 4) prefers tussock grassland, *Triodia* hummock grassland, grassy woodland and low shrublands (Garnett et al, 2000). This species may occur within the application area, however, given the widespread distribution of this species and the degraded nature of the vegetation to be cleared, the habitat within the application area is not significant habitat for this species.

Striated Grasswrens (DEC Priority 4) live on sandplains dominated by mature *Triodia* hummock grassland with an overstorey of shrubs, usually mallee eucalypts (Garnett et al, 2000). Currently the major threat throughout the subspecies' range is fire, especially extensive fires that destroy mature hummock grassland over large

areas (Garnett et al, 2000). There are vast amounts of *Triodia* hummock grassland within the Pilbara IBRA region that this species can utilise. It is not likely that the vegetation within the application area is significant habitat for this species.

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

Methodology
Australian Musuem Online (2007a)
Australian Musuem Online (2007b)
Australian Museum Online (2007c)
Braithwaite et al (1994)
DEC (2006)
Department of Environment and Water Resources (2007a)
Department of Environment and Water Resources (2007b)
DNREA (2007)
Firestone (1999)
Garnet et al (2000)
Hamersley Iron (2007)
KLA (2007)
Start et al (2000)
Western Australian Museum (2008)

(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

According to available databases, no Declared Rare or Priority Flora species have been recorded within the application area (GIS Database).

A flora survey conducted over the application area did not find any Declared Rare or Priority flora species within the application area (KLA, 2007). Ten Priority flora species were located in close proximity to the application area (KLA, 2007). These populations will not be impacted by the proposed clearing.

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

Methodology
KLA (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 (TEC) located within the application area (GIS Database). The nearest TEC is located approximately 40 km to the east. At this remote distance there is little likelihood of any impact to this TEC from the proposed clearing.

None of the vegetation communities identified during a flora survey over the application area are considered to be threatened ecological communities, or ecological communities at risk (KLA, 2007).

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

Methodology
KLA (2007)
GIS Database:
- Threatened Ecological Communities - CALM

(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

According to available databases, the application area falls within the Pilbara IBRA Bioregion (GIS Database). This bioregion's vegetation extent remains at approximately 100% of its Pre-European extent (see table). Beard Vegetation Association 162 and 567 occur within the application area (GIS Database). These vegetation associations remain at 100% of their Pre-European extent (see table). Both Beard vegetation associations are well represented in conservation estate (see table).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~100	Least Concern	6.3
Beard veg assoc. – State					
162	547,268	547,268	~100	Least Concern	11.4
567	777,517	777,517	~100	Least Concern	22.3
Beard veg assoc. - bioregion					
162	20,007	20,007	~100	Least Concern	0
567	776,833	776,833	~100	Least Concern	22.3

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

Therefore, the application area is not part of a remnant of native vegetation in an area that has been extensively cleared.

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 Database:
- 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 at variance to this Principle

According to available databases there are several minor, non-perennial drainage lines within the application area (GIS Database).

According to a vegetation survey conducted over the application area, one particular vegetation type is described as 'Broad Ephemeral Creek'. This vegetation type is described as *Acacia aneura*, *A. pruinocarpa* low open forest over low open shrubland over *Triodia epactia* hummock grassland (KLA, 2007). This vegetation description is not consistent with vegetation that is riparian in nature. It is most likely that this vegetation type occurs in a minor drainage line that carries surface run-off during times of intense rainfall. None of the species listed above are limited to drainage lines or creeklines.

Based on the above, the proposed clearing is at variance to this Principle. However, the clearing of vegetation and subsequent construction of a waste dump is not likely to significantly alter hydrology downstream of the application area.

Methodology KLA (2007)
GIS Database:
- Hydrography, Linear - DoE 1/2/04.

(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 application area has been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al 2004).

The application area is composed of the following land systems (GIS Database):

1) Boolgeeda
2) Rocklea

The Boolgeeda Land System is described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands (Van Vreeswyk et al, 2004). The vegetation within the

system is not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al, 2004). An analysis of aerial photography for the area reveals the application area is most likely to consist of the "stony slope and upper plain" land unit within this land system. The stony mantle on the slopes and plains within this land unit prevent erosion.

The Rocklea Land System is described as basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands (Van Vreeswyk et al, 2004). The system has a very low erosion hazard (Van Vreeswyk et al, 2004). An analysis of aerial photography for the application area reveals the application area is most likely to consist of "lower slope" and "stony plain and interfluve" land units. The stony mantle on the slopes and plains within this land unit prevent erosion.

A waste dump will occupy the area cleared post clearing. Hamersley Iron (2007) have advised that land degradation through alluvial sedimentation could occur after construction of the waste dump. Pilbara Iron has developed effective means to rehabilitate waste dump outslopes as erosion resistant surfaces. The physical characteristics of the waste rock are conducive to the development of stable non-erosive waste rock landforms covered with a spinifex ecosystem.

The application area experiences low rainfall (311 mm/year) (BOM, 2008), and very high pan evaporation rates (~3400 mm/year) (Luke et al, 1987). Most rainfall will be either utilised by vegetation or lost through evaporation. Subsequently, there is little recharge of groundwater as a result of rain. As a result, the removal of 43 hectares of vegetation is not likely to lead to a rise in water table, which can lead to waterlogging or salinisation.

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

Methodology BOM (2008)
Luke et al (1987)
Van Vreeswyk et al (2004)
GIS Database:
- Rangeland Land System Mapping - DA
- Groundwater Salinity, Statewide

(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 application area is located approximately 12 km to the west of Karijini National Park (GIS Database). At this distance it is not likely that the vegetation within the application area provides a buffer to a conservation area, or is important as an ecological link to a conservation area. The vegetation types within the application areas are well replicated in other land systems within the Pilbara region. Subsequently, their conservation status is under no threat.

It is noted by the assessing officer that large areas of vegetation between the application area and Karijini National Park were burnt around late December to early January 2008.

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

Methodology GIS Database:
- CALM Managed Lands and Waters - CALM 1/7/05

(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**
According to available databases, the application area is not located within a Public Drinking Water Supply Area (PDWSA) (GIS Database).

The area is located within a Rights in Water Irrigation Act, 1914 (RIWI Act) Surface Water Management Area (DoW, 2008). The proponent is required to obtain a Beds and Banks Permit in order to disturb any water course (DoW, 2008). The area is located in a RIWI Act Groundwater area. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2008).

There are no permanent waterbodies or watercourses within, or in association with the application area (GIS Database). Rainfall in this area is mainly restricted to a wet summer season, where precipitation can be variable. Rain can be either intense falls associated with cyclonic events, or scattered falls associated with local thunderstorms. The application area receives rainfall of approximately 300 mm/year (BOM, 2008), and experiences a pan evaporation rate of approximately 3400 mm/year (Luke et al, 1987). Therefore, during normal rainfall events, surface water within the application area is likely to evaporate or be utilised by vegetation quickly. However, substantial rainfall events create surface sheet flow which is likely to be high in sediments.

During normal rainfall events, the proposed clearing would not likely lead to an increase in sedimentation of waterbodies on or off site.

The application area is located within the Pilbara Groundwater Area (DoW, 2008). Any extraction of groundwater in this area will require a groundwater license (DoW, 2008). The groundwater salinity within the application area is approximately 500 - 1000 mg/L Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. Given the size of the area to be cleared compared to the size of the Hamersley groundwater province (101,668 sq km) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

There are no known Groundwater Dependant Ecosystems within the application area (GIS Database).

The DoW is satisfied that the proposed clearing of 43 hectares is unlikely to have a significant impact on the quality or quantity of groundwater (DoW, 2008).

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

Methodology BoM (2008)
DoW (2008)
Luke et al (1987)
GIS Database:
- Groundwater, Statewide - DoW
- Public Drinking Water Source Areas (PDWSA's) - DoW
- Hydrography, Linear - DOE 1/2/04
- Potential Groundwater Dependent Ecosystems - DoE 2004

(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 application area experiences an arid, tropical climate with a wet summer season and a dry winter season (BOM, 2008). Most rainfall is received during the wet season, but falls can be variable (BOM, 2008). Rain can either be sporadic (local thunderstorms) or heavy and intense (cyclonic events). It is likely that during times of intense rainfall there may be some localised flooding in adjacent areas. However, the method of clearing and the small area to be cleared are not likely to lead to an increase in flood height or duration. Flooding is not expected within the application areas as they are located higher in the landscape.

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

Methodology BOM (2008)

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

Comments

There is a native title claim over the area under application (GIS Database). The claim has been registered with the National Native Title Tribunal. 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*.

One Aboriginal Site of Significance (Site ID, 11186) intersects with the application area. However, Hamersley Iron have advised that the area has been subject to a heritage survey and that there are no heritage impediments to ground disturbance (Hamersley Iron, 2007). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act, 1972* and ensure that no sites of aboriginal significance are damaged though 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.

The application area is located within a *Rights in Water Irrigation Act, 1914* (RIWI Act) Surface Water Management Area (GIS Database). The proponent is required to obtain a Beds and Banks Permit in order to disturb any water course (DoW, 2008). The application area is located in a RIWI Act Groundwater area. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2008).

Methodology DoW (2008)
Hamersley Iron (2007)
GIS Database:
- Native Title Claims - DLI
- Aboriginal Sites of Significance - DIA

- Groundwater, Statewide - DoW

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Production	Mechanical Removal	43	The proposal has been assessed against the Clearing Principles and has been found to be at variance to Principle (f), may be at variance to Principle (a), is not likely to be at variance to Principle (b), (c), (d), (g), (h), (i) and (j) and is not at variance to Principle (e). It is recommended that should a permit be granted, conditions be endorsed on the permit with regards to recording the areas cleared and reporting the areas so cleared and rehabilitated.

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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.