Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4615/1
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: *Iron Ore (Mount Bruce) Agreement Act 1972*, Mineral Lease 252SA (AML 70/252)
Local Government Area: Shire of Ashburton and Shire of East Pilbara
Colloquial name: Koodaideri Mine Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
167		Mechanical Removal	Mineral Exploration, Geotechnical Investigations and Camp Construction

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 8 December 2011

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 for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database; Shepherd, 2009):

82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and

111: Hummock grasslands, shrub steppe; *Eucalyptus gamophylla* over hard spinifex.

A flora and vegetation survey of the application area and the immediate surrounds was conducted by Biota Environmental Sciences (Biota) (2011a) in July 2010. This survey identified 21 vegetation communities within the application area (Biota, 2011a):

Vegetation of Foothills, Slopes and Hillslopes

AanElTspsTHt - *Acacia aneura*, *Eucalyptus leucophloia* scattered low trees over *Triodia* sp. Shovelanna Hill open hummock grassland over *Themeda triandra* tussock grassland;

AarAspTspsTw - *Acacia arida* tall open shrubland over *Acacia spondylophylla* low shrubland over *Triodia* sp. Shovelanna Hill, *Triodia wiseana* hummock grassland;

AiGwTlaTp - *Acacia inaequilatera*, *Grevillea wickhamii* open shrubland over *Triodia lanigera*, *Triodia Pungens* open hummock grassland;

AprGwAarAspTsps - *Acacia pruinocarpa*, *Grevillea wickhamii*, *Acacia arida* tall open scrub over *Acacia Spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill open hummock grassland;

ChAiGwTsps/Te/Tw - *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera, Grevillea wickhamii* scattered tall shrubs over *Triodia* sp. Shovelanna Hill or *Triodia epactia* or *Triodia Wiseana* hummock grassland;

ElAbTwTsps - *Eucalyptus leucophloia* scattered low trees over *Acacia bivenosa* open shrubland over *Triodia wiseana*, *Triodia* sp. Shovelanna Hill hummock grassland;

ElAhiAarTspsTe -*Eucalyptus leucophloia* scattered low trees over *Acacia hilliana, Acacia arida* low

shrubland over *Triodia* sp. Shovelanna Hill, *Triodia epactia* open hummock grassland;

ElAspTsps - *Eucalyptus leucophloia* scattered low trees over *Acacia spondylophylla* low open shrubland over *Triodia* sp. Shovelanna Hill hummock grassland;

ElChAmTw - *Eucalyptus leucophloia*, *Corymbia hamersleyana* low open woodland over *Acacia maitlandii* low shrubland over *Triodia wiseana* hummock grassland;

ElChGwAprTsps
Eucalyptus leucophloia, *Corymbia hamersleyana* scattered low trees over *Grevillea wickhamii, Acacia pruinocarpa* scattered shrubs over *Triodia* sp. Shovelanna Hill hummock grassland;

ElEgEkTw - *Eucalyptus leucophloia* low woodland over *Eucalyptus gamophylla*, *Eucalyptus kingsmillii* scattered low mallees over *Triodia wiseana* open hummock grassland;

ElEgHcGwAspAarTspsTw - *Eucalyptus leucophloia*, *Eucalyptus gamophylla* scattered low trees over *Hakea chordophylla*, *Grevillea wickhamii* tall open scrub over *Acacia spondylophylla*, *Acacia arida* shrubland over *Triodia* sp. Shovelanna Hill, *Triodia wiseana* open hummock grassland; and

ElGwAhiAspTwTsps - *Eucalyptus leucophloia* low woodland over *Grevillea wickhamii* scattered shrubs over *Acacia hilliana, A*cacia *spondylophylla* scattered low shrubs over *Triodia* sp. Shovelanna Hill open hummock grassland.

Vegetation of Creeks, Gullies and Gorges

AiGpTeCEc - *Acacia inaequilatera*, *Grevillea wickhamii* tall shrubland over *Triodia epactia* hummock grassland over *Cenchrus ciliaris* tussock grassland;

AprGwCEcTe - *Acacia pruinocarpa*, *Grevillea wickhamii* tall shrubland over *Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland;

AprApyAThCEc - *Acacia pruinocarpa* scattered trees over *Acacia pyrifolia*, *Atalaya hemiglauca* shrubland over *Cenchrus ciliaris* tussock grassland;

ApyGwAThGOrTErCEcTe - *Acacia pyrifolia*, *Grevillea wickhamii*, *Atalaya hemiglauca*, *Gossypium robinsonii* tall open scrub over *Tephrosia rosea* scattered low shrubs over *Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland;

AtuAThGwApyTErCEc - *Acacia tumida, Atalaya hemiglauca, Grevillea wickhamii, Acacia pyrifolia* tall open scrub over *Tephrosia rosea* low open shrubland over *Cenchrus ciliaris* tussock grassland; and

ChApyAtuTErCEc - *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia*, *Acacia tumida* tall closed shrubland over *Tephrosia rosea* low open shrubland over *Setaria* sp. closed tussock grassland.

Mosaic Units

Gully Mosaic - Deep gullies with different microclimates within the study area supported variable vegetation units at a scale too fine to map individually; and

Koodaideri spring - This mapping unit comprised a mosaic of riparian vegetation types associated with a narrow gorge.

Clearing Description

Hamersley Iron Pty Ltd is proposing to clear up to 167 hectares of native vegetation within a broader boundary of approximately 6,941 hectares for the purpose of geotechnical investigations, sterilisation drilling, mineral exploration and a construction camp.

Clearing will be conducted using a dozer with raised blade techniques where possible. Blade down techniques will be used in areas of steep or rough terrain and to provide a safe work environment.

Vegetation Condition

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

To

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

Comment

The application area is located within the Pilbara region of Western Australia and is situated approximately 73 kilometres south east of Wittenoom.

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 is at variance to this Principle

The proposed clearing is located approximately 73 kilometres south east of Wittenoom in the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). At a broad scale, vegetation can be described as Mulga low woodlands over bunch grasses on fine textured soils in valley floors and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002). Rare features of the subregion include gorges of the Hamersley Ranges (particularly those within Karijini National Park), Palm Spring, Duck Creek and Themeda grasslands (CALM, 2002). Permanent spring systems such as Weeli Wolli are also listed for their importance as refugia (CALM, 2002).

A flora and vegetation survey of the application area and its immediate surrounds was conducted by Biota (2011a) in July 2010. A total of 269 flora taxa from 103 genera and 39 families were recorded within the application area (Biota, 2011a). Previous studies around the Koodaideri area have recorded 346 flora taxa form 145 genera and 51 families (Biota, 2011a). It is likely the lower species number recorded during the Biota (2011a) 2010 survey is due to low rainfall levels in the months prior to the survey.

Flora and vegetation surveys conducted by Pilbara Iron and Biota, in 2007 and 2010 respectively, have identified one Declared Rare Flora (DRF) and six Priority Flora species within the application area (Biota, 2011a):

- *Lepidium catapycnon* (Rare) – known from a number of locations in the Hamersley Range extending from Tom Price to Newman;
- *Vigna* sp. Central (Priority 2): this species is known from a wide range with records south of Onslow in the west to north east of Marble Bar (Western Australian Herbarium, 2011). There is some confusion over the determination of undescribed species of *Vigna*, particularly between *Vigna* sp. Central and *Vigna* sp. Hamersley Clay, which is not listed as Priority;
- *Nicotiana umbratica* (Priority 3): This species is known from a broad range within the Pilbara (Western Australian Herbarium, 2011);
- *Sida* sp. Barlee Range (Priority 3): This species was recorded at three locations within the vegetation survey area. It is known from quite a broad range within the southern Pilbara and northern Gascoyne bioregions (Western Australia, 2011). Historical records exist for this species approximately 5.4 kilometres south west of the application area;
- *Themeda* sp. Hamersley Station (Priority 3): there is one record of this species within the vegetation survey area and another record 2 kilometres north. It is known from a broad distribution within the Pilbara from Karratha to Newman (Western Australia, 2011);
- *Eremophila magnifica* subsp. *magnifica* (Priority 4): this species was recorded at two locations within the application area; and
- *Rhynchosia bungarensis* (Priority 4): this species was recorded from seven locations within the application area. This species has been recorded throughout the south west Pilbara and into the northern Gascoyne and Carnarvon bioregions.

All of these conservation significant flora species are known from numerous locations outside of the application area. Given the low impact, non contiguous nature of the majority of the proposed clearing, it is unlikely that the proposed clearing will impact on the conservation of any of the Priority Flora species. Potential impacts to the DRF species *Lepidium catapycnon* may be minimised by the implementation of a flora management condition.

Eleven introduced taxa, *Acetosa vesicaria, Aerva javanica, Bidens bipinnata, Cenchrus ciliaris, Cenchrus setiger, Flaveria trinervia, Lactuca saligna, Malvastrum americanum, Portulaca oleracea, Setaria verticillata* and *Sigesbeckia orientalis*, were recorded during vegetation surveys conducted through the Koodaideri area (Biota, 2011a). 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 can in turn lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. None of these species are listed as a 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Agriculture and Food. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The application area lies within the buffer zones of two Priority Ecological Communities (PEC's), Fortescue Marsh (Priority 1) and Fortescue Valley Sand Dunes (Priority 3) (GIS Database). According to a flora and vegetation survey conducted by Biota (2011a) over the application area, no vegetation communities associated with either of these PEC's is present within the application area.

A fauna survey was conducted over the application area by Biota (2011b) in August 2010. This survey identified 105 fauna species comprised of 50 avifauna species, 13 non-volant mammal species, ten bat species and 32 herpetofauna species (Biota, 2011b). There is a diverse range of fauna habitats within the application area, due mainly to the large application area (Biota, 2011b).

Seven conservation significant fauna species have been recorded within the application area (Biota, 2011b). Of particular concern is the presence of the Northern Quoll, Pilbara Orange Leaf-nosed Bat and the Ghost bat. Potential impacts to these species as a result of the proposed clearing may be minimised by the implementation of a fauna management condition.

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

Methodology

Biota (2011a)
Biota (2011b)
CALM (2002)
Western Australian Herbarium (2011)
GIS Database:
- IBRA WA (regions – subregions)

(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

A fauna survey conducted by Biota (2011b) of the application area and its surrounds identified the following seven fauna habitat types within the application area:

- Plains;
- Hill slopes;
- Colluvial drainage line;
- Minor drainage line;
- Gully floor;
- Rocky hill slope; and
- Rocky gorge.

Areas containing permanent water within the Pilbara region are considered to represent significant refugia for many species, especially during dry years (Biota, 2011b). Additionally these areas represent important foraging habitat for many taxa, including conservation significant species such as the Northern Quoll and the Pilbara Orange Leaf-nosed Bat. While not containing water, other gorges present within the study area represent potential core habitat for threatened fauna species such as the Northern Quoll and the Pilbara Orange Leaf-nosed Bat (Biota, 2011b).

A fauna survey of the application area and its immediate surrounds was conducted by Biota (2011b) in August 2010. This survey recorded the following seven conservation significant fauna species within the application area (Biota, 2011b):

Northern Quoll (*Dasyurus hallucatus*) Schedule 1 and Endangered – One individual, which had been recently killed by a bird of prey, was recorded within the application area. The preferred habitat for this species is near major creeklines and rivers and in open, rocky habitat and is also commonly found in gorges. A permanent water body, Koodaideri Springs, and numerous gorges are present within the application area. Many areas within the application area, particularly in the southern section, remain unsurveyed. Potential impacts to this species as a result of the proposed clearing may be minimised by the implementation of a fauna management condition;

Pilbara Orange Leaf-nosed Bat (*Rhinonicteris aurantius*) Schedule 1 and Vulnerable – the occurrence of this species is influenced by the availability of suitable roost caves. That is deep caves offering suitable humidity and stable temperatures. A colony of approximately 40 individuals was recorded adjacent to the application area. Many areas within the application area, particularly in the southern section, remain unsurveyed. Given the known presence of this species in the local area and the potential for suitable habitat to be located within the application area, it is possible that this species may be impacted by the proposed clearing. Potential impacts to this species as a result of the proposed clearing may be minimised by the implementation of a fauna management condition;

Pilbara Olive Python (*Liasis olivaceus barroni*) Schedule 1 and Vulnerable – this species occurs in rocky areas within the Pilbara, showing a preference for rocky habitats near water, particularly rock pools. One individual was recorded within the application area in a rock pool at Koodaideri Springs. While the proposed clearing may impact on individuals of this species, it is considered unlikely to impact on the conservation of this species;

Australian Bustard (*Ardeotis australis*) Priority 4 – prefers tussock grassland, Triodia hummock grassland, grassy woodland and low shrublands (Garnett et al., 2000). This species was observed during the flora survey (Biota, 2011a). Given the widespread distribution of this species and the abundant amount of suitable habitat within the Hamersley Ranges, the vegetation within the application area is not significant habitat for this species;

Star Finch (*Neochmia ruficaudata*) Priority 4 – has a patchy distribution within the Pilbara and at low densities where it occurs (Garnett et al., 2000). There are occasional concentrations at Exmouth and Millstream (Garnett et al., 2000). Star Finch inhabits grasslands and eucalypt woodland close to water, where they feed on seeds (Garnett et al, 2000). Birds tend to be resident in large flocks during the dry season, and disperse to breed during the wet season (Garnett et al., 2000). The Star Finch is likely to be present within the application area following heavy rain when water is likely to pool within creeks. However, this vegetation type is widespread throughout the Pilbara region and it is unlikely that the vegetation to be cleared represents significant habitat for this species;

Ghost bat (*Macroderma gigas*) Priority 4 – genetic studies of this species have shown that the entire species is centralised upon regional maternity sites, of which only ten are known to exist (Van Dyck & Strahan, 2008). Although Ghost bats disperse widely when not breeding, the populations focus upon so few roost sites is of cause for serious conservation concern. Many areas in the application area, particularly in the southern section, remain unsurveyed. Given the presence of this species within the application area and the significance of its roost caves, any roost caves occurring within the application area should be avoided. Potential impacts to this species as a result of the proposed clearing may be minimised by the implementation of a fauna management condition; and

Western Pebble-mound Mouse (*Pseudomys chapmani*) Priority 4 – this species occurs on gentle slopes of rocky ranges where the ground is covered by stony mulch and vegetated by hard Spinifex, often with sparse overstory of eucalypts and scattered shrubs (Van Dyck & Strahan, 2008). A decline in this species occurred prior to 1970, likely to be caused by the introduction of foxes and exotic herbivores (Van Dyck & Strahan, 2008). This species is considered to be secure in its remaining range where foxes are rare and preferred habitat is little utilised by exotic herbivores (Van Dyck & Strahan, 2008).

Given the broad distribution and common habitats for the Pilbara Olive Python, Australian Bustard, Star Finch and Western Pebble-mound mouse, it is considered unlikely that the proposed clearing will impact on the conservation of these species. Suitable roost caves for the Pilbara Orange Leaf-nose bat and Ghost bat are uncommon and the destruction of such habitat could adversely impact the conservation of these species. Additionally, given the Endangered status of the Northern Quoll, destruction of Northern Quoll dens may adversely impact the conservation of this species. Potential impacts to the Northern Quoll, Pilbara Orange Leaf-nosed Bat and Ghost Bat may be minimised by the implementation of a fauna management condition.

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

Methodology Biota (2011b)
Garnett et al. (2000)
Van Dyck & Strahan (2008)

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

Comments **Proposal is at variance to this Principle**
Numerous flora and vegetation surveys have been conducted over the application area (Biota, 2011a). From these surveys, numerous locations of the Declared Rare Flora (DRF) species *Lepidium catapycnon* have been recorded, predominantly in the north west corner of the application area (Biota, 2011a). Potential impacts to this DRF species as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

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

Methodology Biota (2011a)

(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 records of Threatened Ecological Communities (TEC's) within the application area (GIS Database). The nearest known TEC is approximately 94 kilometres south east of the application area (GIS Database). At this distance there is little likelihood of any impact to the TEC as a result of the proposed clearing.

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

Methodology GIS Database:
- Threatened Ecological Sites Buffered

(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 application area is located within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). Shepherd (2009) reports that approximately 99.89% of the pre-European vegetation remains in the Pilbara bioregion.

The vegetation in the application area has been broadly mapped as Beard vegetation associations:

82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and

111: Hummock grasslands, shrub steppe; *Eucalyptus gamophylla* over hard spinifex.

According to Shepherd (2009) approximately 100% of Beard vegetation associations 82 and 111 remains within the Pilbara bioregion (see table below).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,193	17,785,001	~99.89	Least Concern	~6.32
Beard vegetation associations - State					
82	2,565,901	2,565,901	~100	Least Concern	~10.24
111	762,964	762,964	~100	Least Concern	~5.46
Beard vegetation associations - Bioregion					
82	2,563,583	2,563,583	~100	Least Concern	~10.25
111	550,287	550,287	~100	Least Concern	~1.29

* Shepherd (2009)
** Department of Natural Resources and Environment (2002)

The vegetation within the application area is not considered to be 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 (2009)
GIS Database:
- IBRA WA (regions – subregions)
- Pre-European Vegetation

(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 numerous non-perennial water courses within the application area (GIS Database). A flora and vegetation survey of the application area conducted by Biota (2011a) identified the following six vegetation communities growing in association with non-perennial watercourses, gullies and gorges:

AiGpTeCEc - *Acacia inaequilatera*, *Grevillea wickhamii* tall shrubland over *Triodia epactia* hummock grassland over *Cenchrus ciliaris* tussock grassland.;

AprGwCEcTe - *Acacia pruinocarpa*, *Grevillea wickhamii* tall shrubland over **Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland;

AprApyAThCEc - *Acacia pruinocarpa* scattered trees over *Acacia pyrifolia*, *Atalaya hemiglauca* shrubland over **Cenchrus ciliaris* tussock grassland;

ApyGwAThGOrTErCEcTe - *Acacia pyrifolia*, *Grevillea wickhamii*, *Atalaya hemiglauca*, *Gossypium robinsonii* tall open scrub over *Tephrosia rosea* scattered low shrubs over *Cenchrus ciliaris* tussock grassland over *Triodia epactia* open hummock grassland;

AtuAThGwApyTErCEc - *Acacia tumida, Atalaya hemiglauca, Grevillea wickhamii, Acacia pyrifolia* tall open scrub over *Tephrosia rosea* low open shrubland over *Cenchrus ciliaris* tussock grassland; and

ChApyAtuTErCEc - *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia*, *A. tumida* tall closed shrubland over *Tephrosia rosea* low open shrubland over *Setaria* sp. closed tussock grassland.

Regionally the flora species associated with these vegetation communities are considered to be of low conservation concern and none of these communities are listed under DEC's "ecosystems at risk" (Biota, 2011; CALM, 2002).

The flora and vegetation survey also identified one vegetation community growing in association with Koodaideri Natural Spring (Biota, 2011a). Potential impacts to this vegetation may be minimised by the implementation of a condition excluding the vegetation associated with the Koodaidrie Spring from the application area.

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

Methodology Biota (2011a)
CALM (2002)
GIS Database:
- Hydrography, linear

(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 mapped as occurring in the following land systems (GIS Database):

The Boolgeeda land system is characterised by 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 this land system is generally not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Newman land system is described by Van Vreeswyk et al. (2004) as having rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. Van Vreeswyk et al. (2004) reports that much of this system is inaccessible or poorly accessible. The dominant vegetation type is spinifex and the system is burnt fairly frequently (Van Vreeswyk et al., 2004). The land system has low soil erosion risk and approximately 91% of the vegetation is reported as being in very good condition (Van Vreeswyk et al., 2004).

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

Methodology Van Vreeswyk et al. (2004)
GIS Database:
- Rangeland Land System Mapping

(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 is not located within a conservation reserve (GIS Database). The nearest conservation reserve is Karijini National Park, located approximately 25 kilometres west of the application area (GIS Database). At this distance it is unlikely that the proposed clearing will impact on the environmental values of any conservation areas.

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

Methodology GIS Database:
- DEC Tenure

(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 may be at variance to this Principle**
According to available Databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Newman Water Reserve, located approximately 80 kilometres south east of the application area (GIS Database). At this distance it is unlikely that the proposed clearing will impact on the quality of the Newman Water Reserve.

The groundwater salinity within the application area is approximately 500 - 1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). Given the low impact, non contiguous nature of the clearing within the Hamersley Groundwater Province (101,668,326 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

According to vegetation mapping conducted by Biota (2011a), a small portion of the Koodaideri Natural Springs occurs within the application area. Removal of vegetation surrounding the natural spring may result in a build up of sedimentation within the natural spring. Potential impacts to the Koodaideri Natural Spring may be minimised by the implementation of a condition excluding the vegetation growing in association with the Koodaideri Natural Spring from the permitted area.

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

Methodology Biota (2011a)
GIS Database:
- Groundwater Provinces
- Groundwater Salinity, Statewide
- Public Drinking Water Source Area (PDWSA)

(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**
Flooding of minor creeklines and low-lying habitats may occur periodically as a result of cyclonic activity and sporadic thunderstorms (Biota, 2011a). It is considered unlikely that the proposed clearing will cause or exacerbate the incidence or intensity of the flooding.

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

Methodology Biota (2011a)

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

Comments

There are three Native Title Claims (WC10/17, WC 10/15 and WC98/62) over the area under application (GIS Database). These claims have been registered with the Native Title Tribunal on behalf of the claimant groups. However, the tenure 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 two registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of 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.

It is noted that the proposed clearing may impact on a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) for environmental impact assessment under the EPBC Act. The proponent is advised to contact the SEWPAC for further information regarding notification and referral responsibilities under the EPBC Act.

The clearing permit application was advertised on 26 September 2011 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the proposed clearing.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Filed at the Federal Court
- Native Title Claims - Registered with the NNTT

4. References

Biota (2011a) Vegetation and Flora of Koodaideri. Unpublished report prepared for Rio Tinto Iron Ore dated March 2011. Biota Environmental Sciences.

Biota (2011b) Terrestrial Fauna of Koodaideri Phase 1. Unpublished report prepared for Rio Tinto Iron Ore dated March 2011. Biota Environmental Sciences.

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Department of Conservation and Land Management.

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.

Garnett, S.T. & Crowley, G.M. (2000). Action Plan for Australian Birds 2000. Environment Australia, Canberra.

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

Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

Van Dyck, S. and Strahan, R. (2008) The Mammals of Australia Third Edition. Published by Reed New Holland, Sydney.

Van Vreeswyk AME, Payne AL, Leighton KA & Hennig P, (2004). Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, Western Australia.

Western Australian Herbarium (2011) FloraBase - The Western Australian Flora. Department of Environment and Conservation. http://florabase.dec.wa.gov.au/ (Accessed 24/10/2011).

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.