



1. Application details

1.1. Permit application details

Permit application No.: 2296/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: Iron Ore (Mount Newman) Agreement Act 1964, Mineral Lease 244 SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Mesa Gap exploration project

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>The vegetation of the application area is broadly mapped as Beard Vegetation Associations 29: Sparse low woodland; mulga, discontinuous in scattered groups; 82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>; and 216: Low woodland; mulga (with spinifex) on rises (GIS Database).</p> <p>GHD Pty Ltd (GHD) conducted a flora survey of the application area, in September-October 2007 (GHD, 2007). The following vegetation types were identified within the application area, broadly associated with topographic features:</p> <p>1. Rocky slopes: Found on the rocky southern hills of the survey area.</p> <p>1a: Hummock grassland on top of low rocky hills: <i>Triodia basedowii</i>, with scattered <i>Acacia adoxa</i>, <i>Acacia hilliana</i>, with isolated emergent <i>Acacia bivenosa</i>, <i>Eucalyptus leucophloia</i>.</p> <p>1b: Hummock grasslands with scattered low shrubs and isolated tall shrubs on slopes of low rocky hills: <i>Triodia basedowii</i>, with <i>Acacia hilliana</i>, <i>Acacia adoxa</i>, <i>Gompholobium polyzygum</i>, with scattered <i>Grevillea wickhamii</i>, <i>Acacia bivenosa</i>, <i>Acacia inaequilatera</i>, <i>Hakea lorea</i>, <i>Hakea chordophylla</i>. <i>Goodenia</i> sp. Sandy Creek occurs in disturbed areas. <i>Triodia pungens</i> occurs with <i>Triodia basedowii</i> in deeper soils at base of low rocky hills.</p> <p>1c: Hummock grasslands with scattered low shrubs and isolated tall shrubs on outcrops of low rocky hills: <i>Triodia basedowii</i>, with scattered <i>Acacia hilliana</i>, <i>Acacia adoxa</i>, <i>Ptilotus obovatus</i>, <i>Eremophila latrobei</i>, <i>Senna</i> species, <i>Tribulus platypterus</i>, with mixed bunch grasses dominated by <i>Aristida</i> species, and isolated emergent <i>Eucalyptus leucophloia</i>.</p> <p>2. Drainage Lines</p> <p>2a: Mixed Acacia scrubland over mixed bunch and hummock grasses with scattered emergent tree species: <i>Acacia monticola</i>, <i>Acacia ancistrocarpa</i>, <i>Acacia pachyacra</i>, <i>Acacia coriacea</i>, <i>Santalum lanceolatum</i>, <i>Petalostylis labicheoides</i>, <i>Gossypium robinsonii</i>, with scattered emergent <i>Corymbia hamersleyana</i> over <i>Dodonaea coriacea</i>, <i>Senna</i> species, <i>Triodia pungens</i>, <i>Cymbopogon</i> sp., etc.</p> <p>2b: Mulga Woodlands on major drainage lines (recently burnt and lacking in understorey species): <i>Acacia aneura</i> (two variants), <i>Acacia coriacea</i>, <i>Gossypium robinsonii</i> over bunch grasses dominated by <i>Cymbopogon</i>, <i>Themeda triandra</i>, <i>Eragrostis tenellula</i>, <i>Eulalia brownii</i>, <i>Aristida</i> sp, with <i>Pterocaulon</i>, <i>Polycarpaea</i>, <i>Sida</i> species.</p>	<p>BHP Billiton Iron Ore Pty Ltd (BHP Billiton) have applied to clear up to 152 hectares (ha) of native vegetation within a total application area of approximately 2709 ha, for the purposes of the Mesa Gap exploration drilling project.</p> <p>Initial clearing will be for approximately 88 drill pads, and associated sumps and access tracks. Additional drilling may be undertaken subsequently, over a five year period, dependant upon the initial results. Each drill pad will be approximately 20 metres x 20 metres, each sump will be approximately 5m x 2m x 1m deep, and access tracks will be approximately 4m wide (BHP Billiton, 2007).</p> <p>Existing tracks and other previously disturbed areas will be utilised wherever possible. Where new tracks are required, they will be established using raised blade clearing techniques wherever practicable (BHP Billiton, 2008). Drill pads and sumps will be mechanically cleared using earth moving equipment with a lowered blade. All topsoil and vegetation will be stockpiled for later use in rehabilitation. All drill pads and sumps will be rehabilitated within twelve months.</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).</p> <p>to</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>	<p>The application area is roughly rectangular in shape, approximately 13 km long and 2 km wide. The western end of the application area is located approximately 27 km east of Newman, in the Pilbara region (GIS Database).</p> <p>The vegetation condition was derived from a vegetation survey conducted by GHD Pty Ltd (2007).</p>

3. Broad Valley Plains: Very open tree steppe, over scattered shrubs with mixed bunch and hummock grasslands: *Eucalyptus leucophloia*, *Eucalyptus gamophylla*, *Corymbia deserticola* with scattered *Acacia pruinocarpa*, *Acacia aneura*, isolated *Grevillea pyramidalis* over *Acacia ancistrocarpa*, *Acacia pachyacra*, *Eremophila fraseri*, *Solanum*, *Sida* species, *Senna* species, over mixed hummock and bunch grasslands dominated by *Triodia pungens*, *Aristida* species, *Eragrostis* species, with mixed herbs, including *Goodenia* sp. Sandy Creek. This vegetation type is considered to be the most variable, and the most diverse (GHD, 2007).

The vegetation condition within the survey area ranged from Good to Excellent (GHD, 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 is not likely to be at variance to this Principle

The application area is located within the Fortescue sub-region of the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database).

A Flora survey of the application area was conducted by GHD in September-October 2007 (GHD, 2007). No vegetation communities of conservation significance were recorded during the survey and all the vegetation types found within the application area are well represented in the Pilbara Region (GHD, 2007; GIS Database). The application area was not considered to represent an area of outstanding biodiversity (GHD, 2007).

A fauna habitat survey of the application area concluded that the habitat types occurring within the application area were well represented in the Pilbara Region, and were not of specific conservation significance (GHD, 2007). Some fauna of conservation significance are known to occur within the application area, but none are likely to be restricted to the application area (Ecologia, 2004; GHD, 2007).

Approximately 50% of the application area (at the western end) falls within the Sylvania Pastoral Lease (GIS Database) and disturbance from cattle grazing was evident in some parts of the application area, particularly on lower lying, more easily accessible areas (GHD, 2007).

The vegetation in some parts of the application area was considered to be in excellent condition (GHD, 2007). Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of weed management.

The landforms, vegetation types and fauna habitats in the application area are well represented in the Pilbara Region, including within the Karijini and Chichester Range National Parks (BHP Billiton, 2008; Ecologia, 2004; GHD, 2007; GIS Database). Some flora and fauna of conservation significance are known to occur within the application area, however these species are not expected to be impacted as a consequence of the proposed clearing. The sparse nature of the proposed clearing for exploration drill pads and access tracks is unlikely to have any significant impact on the biological diversity of the region.

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

Methodology

BHP Billiton (2008).
Ecologia (2004).
GHD (2007).
GIS Database:
- Pre-European Vegetation - DA 01/01.
- IBRA Regions

(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

GHD (2007) conducted a fauna habitat assessment of the application area as part of the flora survey. The habitat types identified within the application area include: rocky outcrops, spinifex rocky hills and slopes, minor rocky drainage lines with denser vegetation, open mixed sandy and rocky plains with hummock and bunch grasses, and (recently burnt) mulga woodlands (GHD, 2007). No apparent permanent or semi-permanent water points were located within the survey area (GHD, 2007).

The GHD survey did not include any fauna trapping, however Ecologia conducted a fauna survey of an area immediately to the north-west of the current application area during 2004. The landforms of the two different

survey areas are similar (GIS Database). The fauna habitats recorded by GHD (2007) as occurring within the current application area are similar to those recorded by Ecologia (2004) in the adjacent survey area, and hence many of the same fauna species are likely to occur.

Ecologia (2004) recorded four fauna species of conservation significance within the adjacent survey area: Fork-tailed swift, (*Apus pacificus*); Rainbow Bee-eater, (*Merops ornatus*); Ghost Bat (*Macroderma gigas*); and Western Pebble-mound Mouse (*Pseudomys chapmani*).

The Fork-tailed swift and the Rainbow Bee-eater are migratory birds listed under the JAMBA and CAMBA international agreements (Ecologia, 2004). These two species are highly mobile, and the small areas of proposed clearing scattered over a much larger application area are unlikely to have any significant impact on the habitat for these species.

The Ghost Bat is listed as Vulnerable on the International Union for the Conservation of Nature and Natural Resources (IUCN) list of rare and endangered species. The Ghost Bat is known to roost in caves and mine shafts. Rock crevices occur along the ridgelines within the application area (GHD, 2007), and some caves may also occur. The proposed clearing for exploration activities is not likely to impact on roosting sites. The application area may be used by Ghost Bats as foraging ground, however the sparse nature of the proposed clearing is unlikely to have any significant impact on the available foraging habitat.

The Western Pebble-mound Mouse (P4) is listed on the Department of Environment and Conservation (DEC) Priority Fauna list of poorly known fauna. The Western Pebble-mound Mouse constructs mounds from small pebbles, and occurs in hummock grassland areas of *Triodia*, *Cassia*, *Acacia* and *Ptilotus* on skeletal soils which contain suitable sized pebbles (Ecologia, 2004). This species was recorded on two occasions during the nearby Ecologia survey, and GHD (2007) recorded one active mound within the current application area. This species is widespread throughout the Pilbara region and the proposed clearing is unlikely to have a significant impact on this species. Any active pebble mounds sighted during the exploration programme will be avoided (BHP Billiton, 2007).

None of the above mentioned species are likely to be specifically dependant on habitats found within the application area, although some taxa may utilize the project area as part of a foraging ground. Ecologia (2004) and GHD (2007) considered that the fauna habitats found within the respective survey areas are well represented within the Karijini and Chichester Range National Parks, and in the Pilbara region generally. Prior to commencing any clearing, the areas proposed to be cleared will be inspected by an Environmental Advisor, to identify any significant fauna habitat (eg. large trees, Pebble Mound Mouse mounds), and these sites will be avoided (BHP Billiton, 2007).

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

Methodology BHP Billiton (2007).
BHP Billiton (2008).
Ecologia (2004).
GHD (2007).

(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

The nearest known Declared Rare Flora are six populations of *Lepidium catapycnon* which occur approximately 35-38km west of the application area (GIS Database). Department of Environment and Conservation (DEC) databases have no records of any other populations of Declared Rare or Priority flora within a 50km radius of the areas applied to clear (GIS Database).

No species of Declared Rare or Priority Flora were recorded during the flora survey (GHD, 2007). One taxon of local significance was recorded during the survey (GHD, 2007). This taxon, an *Aenictophyton* similar to *Aenictophyton reconditum*, was collected from the same sites in a previous survey conducted by Ecologia in 2004. It has also been recorded from several sites in the eastern Ophthalmia Range (GHD, 2007). *Aenictophyton reconditum* has a wide distribution in the Pilbara and Great Sandy Desert IBRA regions and is listed as not threatened (WA Herbarium, 2008). The taxonomy of *Aenictophyton* sp. (*aff. reconditum*) remains unclear, however clearing of this potential new taxa should be avoided until its true conservation status has been determined.

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

Methodology GHD (2007).
WA Herbarium (2008).
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's) within the area applied to clear (GIS Database). The nearest known TEC is the Ethel Gorge aquifer stygobiont community which is located approximately 15 km west of the western end of the application area (GIS Database). Groundwater drawdown is listed as a threatening process for the Ethel Gorge stygofauna (CALM, 2002), however the proposed clearing is not expected to have any effect on groundwater levels.

GHD (2007) reported that no threatened ecological communities were identified during the flora survey of the application area.

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

Methodology CALM (2002).
GHD (2007).
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 application area falls within the IBRA Pilbara Bioregion. Shepherd et al. (2001) report that approximately 99.9% of the pre-European vegetation still exists in this Bioregion. The vegetation in the application area is recorded as Beard Vegetation Associations 29: Sparse low woodland; mulga, discontinuous in scattered groups; 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and 216: Low woodland; mulga (with spinifex) on rises (GIS Database). According to Shepherd et al., (2001) there is approximately 100% of these vegetation types remaining.

Although large scale mining operations are located in close proximity to the application area and surrounding areas have been the subject of previous and current mineral exploration programmes, the region in which the clearing is proposed to occur has not undergone broad scale clearing. Hence the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,164	17,794,164	~99.9	Least Concern	6.3
Beard vegetation associations - WA					
29	7,904,064	7,904,064	~100	Least Concern	0.3
82	2,565,930	2,565,930	~100	Least Concern	10.2
216	280,760	280,760	~100	Least Concern	0
Beard vegetation associations - Pilbara Bioregion					
29	1,133,228	1,133,228	~100	Least Concern	1.9
82	2,563,610	2,563,610	~100	Least Concern	10.2
216	476	476	~100	Least Concern	0

* 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 Dept of Natural Resources and Environment (2002).
Shepherd et al. (2001).
GIS Database:
- 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

Several minor seasonal drainage lines cut through the application area, forming part of the Fortescue River Upper catchment (GIS Database). These ephemeral creeklines are dry for most of the year, only flowing briefly immediately following significant rainfall (GIS Database). GHD (2007) confirmed that no permanent or semi-permanent water points were located within the application area during the survey.

Based on the above, the proposal is at variance to this Principle. However, the proposed clearing is unlikely to result in any significant impact to any watercourse or wetland. Minor drainage lines will be avoided where practicable (BHP Billiton, 2007). Any minor drainage lines that are considered significant for local surface water flows will be given a 10m wide buffer (BHP Billiton, 2007). If the beds and banks of any watercourses are to be disturbed during the exploration programme, a Bed and Banks Permit may be required. The proponent is advised to liaise with the Department of Water for advice in this regard.

Methodology BHP Billiton (2007).

GHD (2007).

GIS Database:

- Hydrographic Catchments - Catchments
- Hydrography, Linear - DOE 01/02/04.
- Lakes, 1M - GA 01/06/00.
- Rivers 250K - GA.

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

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

The majority of the northern half of the application area is broadly mapped as the Boolgeeda Land System, with a very small section on the north-eastern boundary mapped as the Washplain Land System. The majority of the southern half of the application area is broadly mapped as the McKay Land System with small areas of Boolgeeda and Newman Land System occurring at the south-eastern boundary (GIS Database).

The Boolgeeda Land System consists of stony lower slopes and plains below hill systems, supporting hard and soft spinifex grasslands and mulga shrublands. This land system is generally not susceptible to erosion (Van Vreeswyk et al., 2004).

The McKay Land System consists of hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting predominantly hard spinifex grasslands. This land system is not prone to degradation or soil erosion (Van Vreeswyk et al., 2004).

The Newman Land System consists of jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. This land system is not prone to erosion (Van Vreeswyk et al., 2004).

The Washplain Land System consists of hardpan plains supporting groved mulga shrublands. Some parts of this land system may be moderately susceptible to erosion (Van Vreeswyk et al., 2004). However this land system represents only approximately three percent of the total application area, and the sparse nature of the proposed clearing is unlikely to result in significant land degradation.

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 - 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 areas in the vicinity of the application area. The nearest DEC managed lands are the Collier National Park, approximately 125km south-west of the application area; and the Karijini National Park, approximately 145km north-west of the application area (GIS Database).

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 1/07/05.

(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 western end of the application area (approximately 313 ha) is located within the Newman Water Reserve, a Public Drinking Water Source Area (PDWSA) (GIS Database). All activities conducted within the PDWSA, should be in accordance with the Department of Water (DoW) Land Use Compatibility Tables (DoW, 2008). The proponent is advised to follow the Water Quality Protection Guidelines for the mining and mineral industry, produced by the DoW, to minimise any risk that the proposed clearing and associated activities may pose to the Water Reserve (DoW, 2008).

The application area is located within the Pilbara Groundwater Area, as proclaimed under the *Rights in Water and Irrigation Act 1914*. Any groundwater abstraction within this area will require a Water Licence from the Department of Water (DoW, 2008). The Department of Water has advised that the proposed clearing is unlikely to have any significant impact on groundwater levels or quality (DoW, 2008).

Several minor ephemeral drainage lines run through the application area (GIS Database). These drainage lines only flow briefly immediately following significant rainfall (BHP Billiton, 2008). The application area is located in an arid region, with an average annual rainfall of approximately 300mm falling mainly during the summer months, and an average annual evaporation rate of approximately 3700mm (BHP Billiton, 2008; CALM, 2002), hence the presence of surface water resulting from significant rain events is relatively short-lived. The proposed clearing of relatively small areas of vegetation for exploration activities, scattered over a much larger application area, is unlikely to have any significant impact on surface water flows or quality.

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

Methodology BHP Billiton (2008).
CALM (2002).
DoW (2008).
GIS Database:
- Hydrography, Linear - DOE 1/02/04.
- Public Drinking Water Source Areas - DOE 09/08/05.

(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

There are no permanent watercourses within the application area. Several minor ephemeral drainage lines run through the application area. These drainage lines are dry for most of the year, only flowing briefly immediately following significant rainfall (BHP Billiton, 2008).

The application area drains into the Fortescue River Upper catchment area (GIS Database). Natural flooding occurs occasionally within the catchment area during the wet season (November to March) following significant rainfall (BHP Billiton, 2008). However, the relatively small area to be cleared (152 hectares) in relation to the size of the catchment area (2,975,192 ha) (GIS Database) is unlikely to cause or exacerbate the incidence or intensity of flooding (DoW, 2008).

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

Methodology BHP Billiton (2008).
DoW (2008).
GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

One public submission was received for this clearing permit application. The submission commented that several clearing permits had been granted in surrounding areas and that the cumulative impacts of all the clearing permits should be considered. This issue has been addressed under Principle (e).

The submission also raised concerns regarding potential impacts of the proposed clearing on Aboriginal Heritage sites and Native Title Rights within the application area.

Aboriginal Sites of Significance are protected under the *Aboriginal Heritage Act 1972*. The proponent is committed to the management and protection of Aboriginal heritage sites (BHP Billiton, 2005). BHP Billiton has a heritage protocol agreement with the Nyiyaparli people (traditional owners of the Newman area), and regularly consult with the Nyiyaparli people to undertake Aboriginal heritage surveys in and around Newman (BHP Billiton, 2008). BHP Billiton also has an internal process; the Project Environment and Aboriginal Heritage Review (PEAHR), which is designed to prevent inadvertent disturbance of Aboriginal heritage sites within BHP

Billiton operations. Prior to the commencement of any land disturbance activity, a PEHR must be completed and submitted to BHP Billiton's Aboriginal Affairs Department, for assessment. All land disturbance activities must be approved by BHP Billiton's Environment and Aboriginal Heritage staff (BHP Billiton, 2005).

There are two Aboriginal sites of significance immediately adjacent to the northern boundary of the application area, and several other sites within close proximity to the northern edge of the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

There is one native title claim over the area under application. This claim (WC99-004) has been registered with the National Native Title Tribunal on behalf of the claimant group. 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 (ie. 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*.

Part of the application area (approximately 12%), at the western end, is located within the Newman Water Reserve, a Public Drinking Water Source Area (PDWSA) (GIS Database). The Department of Water (DoW) has advised that activities conducted within the PDWSA should comply with the DoW's Land Use Compatibility Tables (DoW, 2008). The proponent is advised to seek further advice from the DoW to ensure compliance in this regard.

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 BHP Billiton (2005).
BHP Billiton (2008).
DoW (2008).
GIS Database:
- Aboriginal Sites of Significance - DIA 04/07/02.
- Native Title Claims - DLI 19/12/04.
- Public Drinking Water Source Areas - DOE 09/08/05.

4. Assessor's comments

Comment

The proposal has been assessed against the Clearing Principles, and the proposal is at variance to Principle (f), is not at variance to Principle (e), and is not likely to be at variance to Principles (a), (b), (c), (d), (g), (h), (i) and (j).

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, rehabilitation, record keeping and permit reporting.

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, rehabilitation, record keeping and permit reporting.

5. References

- BHP Billiton (2005) Aboriginal Heritage Induction Handbook. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- BHP Billiton (2007) Exploration Environmental Management Plan, Revision 1. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- BHP Billiton (2008) Mesa Gap. Purpose Permit Vegetation Clearing Permit Application. Supporting Documentation, Revision 1. BHP Billiton Iron Ore Pty Ltd, Western Australia.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, 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.
- DoW (2008) Public Drinking Water Source Area (PDWSA) Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR). Department of Water, Western Australia.
- Ecologia (2004) Eastern Ophthalmia Range Expansion Biological Survey. Ecologia Environment, Western Australia.
- GHD (2007) Mesa Gap Flora and Fauna Survey: Mesa Gap Preliminary Assessment Outcomes. GHD Pty Ltd, Western Australia.
- 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., 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).
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P., and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia. Department of Agriculture, Western Australia.
- Western Australian Herbarium (1998-2008) FloraBase - The Western Australian Flora. Department of Conservation and Land Management, Western Australia.

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.