



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2468/3
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*, Special lease for Mining Operations 3116/6038 (Document I 123402 L), Lot 135 on Deposited Plan 48926
Local Government Area: Shire of East Pilbara
Colloquial name: Redmont Construction Camp Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
37		Mechanical Removal	Construction of Redmont Camp extension and associated works

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 26 January 2012

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
Beard vegetation associations have been mapped for the whole of Western Australia, and are a useful tool to examine the vegetation extent in a regional context. One Beard vegetation association is located within the area proposed to be cleared (GIS Database; Shepherd 2009). This vegetation association is:	BHP Billiton Iron Ore Pty Ltd (hereafter referred to as BHP Billiton) have applied to clear up to 37 hectares of native vegetation for the Redmont camp extension project.	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);	Clearing permit CPS 2468/1 was granted by the Department of Mines and Petroleum on 10 July 2008, and was valid from 9 August 2008 to 1 September 2013. The clearing permit authorised the clearing of 30 hectares of native vegetation.
Beard vegetation association 93 - Hummock grasslands, shrub steppe; kanji over soft spinifex.	The project comprises the following elements: accommodation facilities, camp facilities, waste water treatment plant and treated effluent disposal system, office facilities, maintenance compound, fuel storage, access tracks, lay down areas, car parks, borrow pits, water bore construction, topsoil stockpiles and drainage controls (BHP Billiton, 2008). The project also comprises upgrades and maintenance of the existing Redmont operations camp (BHP Billiton, 2011).	To Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).	
Flora and vegetation surveys of the application area were completed by Ecologia in 2007 and 2008. As a result of the flora and vegetation surveys, there were seven vegetation associations identified within the application area (Ecologia, 2007a; 2008a; 2008b):			This Clearing Permit was amended on 24 September 2009 to increase the total area to be cleared from 30 to 31 hectares, and to increase the purpose permit boundary by approximately 0.3 hectares (CPS 2468/2). The increase allowed for the construction of an access track into the Redmont Camp Extension area. An application for an amendment to clearing permit CPS 2468/2 was submitted by BHP Billiton Iron Ore Pty Ltd on 25 November 2011.
Plain vegetation type 1: Scattered <i>Corymbia hamersleyana</i> low trees, over open to moderately dense (in patches) <i>Acacia ancistrocarpa</i> and/or <i>Acacia bivenosa</i> medium to tall shrubs, over sparse mixed low shrubs, with moderately dense <i>Triodia pungens</i> hummock grass;			
Plain vegetation type 2: Scattered <i>Hakea lorea</i> subsp. <i>lorea</i> low trees, over sparse <i>Acacia stellaticeps</i> and <i>Pluchea tetranthera</i> low shrubs, with open mixed tussock and <i>Triodia epactia</i> hummock grasses;			
Plain vegetation type 3: Sparse <i>Corymbia hamersleyana</i> and <i>Acacia eriopoda</i> low trees, over open <i>Acacia inaequilatera</i> and <i>Acacia bivenosa</i> tall shrubs, over open mixed <i>Acacia</i> and <i>Senna spp.</i> , medium to low shrubs, with moderately dense <i>Triodia epactia</i> hummock grass;	The Redmont camp is located approximately 205 kilometres south of Port Hedland, adjacent to the Newman to Port Hedland railway line (BHP Billiton, 2008).		
Plain vegetation type 4: Sparse <i>Corymbia hamersleyana</i> low trees, over sparse <i>Acacia bivenosa</i> medium to high shrubs,			

over open *Acacia stellaticeps* low shrubs, with moderately dense *Triodia epactia* hummock grass;

Recently burnt area: Open mixed low shrubs dominated by *Trachymene oleracea* subsp. *oleracea* with some scattered tussock grasses;

Floodplain / minor depression vegetation: Open *Corymbia hamersleyana* low trees, over sparse to open *Acacia trachycarpa* and *Acacia coriacea* subsp. *pendens* tall shrubs, over open *Acacia bivenosa* medium to low shrubs, over sparse *Pluchea ferdinandi-muelleri* low shrubs, over moderately dense *Triodia wiseana*, *Triodia angusta* hummock grasses, with sparse *Cenchrus ciliaris* tussock grass; and

Mixed hummock and tussock grassland, with scattered *Hakea lorea* subsp. *lorea* outcropping tall shrubs: Scattered *Hakea lorea* subsp. *lorea* low trees, over sparse *Acacia stellaticeps* and *Pluchea tetranthera* low shrubs, with open mixed tussock and *Triodia epactia* hummock grasses.

The proponent requested a change to the reporting date for the clearing permit from 1 September each year to 1 October each year. BHP Billiton Iron Ore Pty Ltd also requested a change to the Clearing Permit boundary and an increase in the approved area from 31 to 37 hectares. There were no additional environmental impacts as a result of this amendment.

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 clearing permit area is located within the Chichester Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS database). The main vegetation and landform features of the region are plains composed of shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges (Kendrick & McKenzie, 2001). High reptile and mammal species diversity within hummock grasslands are a feature of the Chichester subregion (Kendrick & McKenzie, 2001). The main land uses of the subregion are pastoral activity, Aboriginal lands and Reserves, Unallocated Crown Land and Crown Reserves, conservation, and mining.

A flora and vegetation survey of the application area was undertaken by Ecologia (2007a) on the 23 October 2007. As a result of the flora and vegetation survey there were 82 flora taxa recorded within the application area, comprising of 23 families, 40 genera and 76 species. The most species rich plant genera were *Acacia* (15 taxa) and *Senna* (6 taxa), whilst 10 families and 25 genera were represented by a single taxon (Ecologia, 2007a). The amount of flora species recorded in the application area is not reflective of a high level of species diversity in comparison to other flora surveys undertaken in surrounding areas (Ecologia, 2007a). Ecologia (2007a) have stated that the vegetation associations identified during the current flora and vegetation survey and a previous flora survey by Biota were all well represented in the Pilbara.

A fauna survey of a larger study area including the application area, Cowra camp and 5 potential borrow pits between Kurrajurra siding and Yandi, was undertaken in November 2007 by Ecologia (2007b). As a result of the survey, nine native and two introduced species of mammal were recorded, six of which were bats. Forty six bird species from 25 families were recorded, and of a potential 69 reptiles species only seven were recorded. No amphibians were recorded in the application area (Ecologia, 2007b). During the fauna survey no species of conservation significance were identified within the application area (Ecologia, 2007b). Additionally, it should be noted the habitats identified within the application area are well represented in the Pilbara (Ecologia, 2007b).

It is noted that the majority of the application area (central region) has recently been burnt from a previous fire (Ecologia, 2007a). An analysis of photographs of the area to be cleared suggests the burnt area has little to no remaining vegetation and the biodiversity values in these areas have reduced. Further analysis of the photographs suggests the remaining vegetation that was not burnt was in a 'very good' to 'degraded' condition. Additionally, the proposed clearing area has been impacted by access tracks and weeds. During the flora and vegetation survey of the application area two weeds were recorded, these were Kapok Bush (*Aerva javanica*) and Buffel Grass (*Cenchrus ciliaris*) (Ecologia, 2007a). The presence of weeds lowers the biodiversity value of the proposed clearing area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. The implementation of a weed management condition will minimise the risk of the spread of weeds to uninfested areas.

Clearing Permit CPS 2468/1 was amended to increase the total area to be cleared from 30 to 31 hectares, and to increase the purpose permit boundary by approximately 0.3 hectares. The increase allowed for the construction of an access track into the Redmont Camp Extension area. Ecologia (2008a) conducted a flora and vegetation survey over the additional area in March 2008. The additional area did not represent an area of high floristic diversity (Ecologia, 2008a).

A further amendment to Clearing Permit CPS 2468/2 proposes an increase in the area cleared from 31 to 37 hectares and an amendment to the Clearing Permit boundary. Flora and Fauna surveys conducted by Ecologia

(2008b; 2008c and 2008d) did not identify any additional environmental impacts associated with the amendment.

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

Methodology Ecologia (2007a)
Ecologia (2007b)
Ecologia (2008a)
Ecologia (2008b)
Ecologia (2008c)
Ecologia (2008d)
Kendrick & McKenzie (2001)
GIS Database;
- IBRA WA (Regions - Sub-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

Ecologia undertook a fauna survey of a broader area which included the Redmont Camp extension, Cowra Camp, and five borrow pits between Kurrajurra siding, approximately 38 kilometres south of Cowra siding, and Yandi, approximately 90 kilometres north of Newman (Ecologia, 2007b). The fauna survey included a database search, a fauna review based on previous nearby surveys, and a reconnaissance survey conducted between 13 – 16 November 2007 (Ecologia, 2007b).

Based on a Department of Environment and Conservation (DEC) database search and a fauna review of previous surveys, Ecologia (2007b) estimated that up to 10 fauna species of conservation significance potentially may be found within the broader study area, including: Bilby (*Macrotis lagotis*), Tropical Short-tailed Mouse (*Leggadina lakedownensis*), Skink (*Ctenotis aff uber johnstonei*), Grey Falcon (*Falco hypoleucos*), Australian Bustard (*Ardeotis australis*), Rainbow Bee-eater (*Merops ornatus*), Great Egret (*Ardea alba*), Cattle Egret (*Ardea ibis*), Oriental Plover (*Charadrius veredus*) and Fork-tailed Swift (*Apus pacificus*).

Of the species listed above, based on habitat preferences and known distributions, the most likely to be found in the application area are the Grey Falcon, Australian Bustard and Rainbow Bee-eater.

The Grey Falcon (DEC – Priority 4) is a medium-sized falcon which is sparsely distributed in the northern half of Western Australia, restricted to shrublands, grasslands and wooded watercourses and is occasionally found in open woodlands near the coast and occurs near wetlands, where surface water attracts prey (Ecologia, 2007b). The Grey Falcon nests in large eucalypts associated with wetlands or watercourses (Ecologia, 2007b). During the fauna survey three Grey Falcons were recorded on Repeater Tower No. 5, approximately 15 kilometres south of the Redmont camp (Ecologia, 2007b). It is possible that this species may forage in the application area for food; however, it is highly unlikely this species is reliant on the application area for habitat as there are no wooded watercourses present.

The Australian Bustard (DEC - Priority 4) is limited to the arid areas of Northern and Central Australia (Caughley et al., 1986). It is found in tussock grasslands, *Triodia* hummock grassland, grassy woodland and low shrublands (Garnett & Crowley, 2000). Given that there are tussock and *Triodia* hummock grasslands, and low shrublands present within the application area it is possible that the Australian Bustard may frequent the application area. However, it is unlikely that this species would be reliant on the application area for habitat, as the habitat types present are well represented in the local area (Ecologia, 2007b). The vegetation within the application area is therefore unlikely to represent significant habitat for this species.

The Rainbow Bee-eater (Migratory and Marine species - *EPBC Act 1999*) is a medium sized bird, and the only species of bee-eater in Australia (Department of Environment and Water Resources (SEWPAC, 2011). The Rainbow Bee-eater is distributed across much of mainland Australia and on several near shore islands. It occurs in a range of habitats including open forests and woodlands, shrubland areas, grasslands, inland and coastal sand dune systems, mangroves and cleared or semi-cleared habitats (SEWPAC, 2011). It is possible that the Rainbow Bee-eater may forage for food within the application area, however, given that there are large areas of uncleared vegetation surrounding the project it is unlikely that the Rainbow Bee-eater relies on the application area for habitat (Ecologia, 2007b). Based on this, it is unlikely the vegetation within the application area is significant habitat for the Rainbow Bee-eater.

A habitat search was undertaken over the broader survey area, as a result, the Redmont camp was described as generally having a basaltic plain habitat associated with the Chichester Range, characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands (Ecologia, 2007b). Ecologia have stated that the habitats present within the application area are well represented in the Pilbara region (Ecologia, 2007b).

It is relevant to note that much of the application area has been severely burnt and subsequently the habitat values have been reduced in the short term. Additionally, the presence of weeds and the sites proximity to the existing Redmont camp are likely to have further reduced habitat values in the application area.

Clearing Permit CPS 2468/1 has been amended to increase the total area to be cleared from 30 to 31 hectares, and to increase the purpose permit boundary by approximately 0.3 hectares. The increase allows for the construction of an access track into the Redmont Camp Extension area. Ecologia (2008a) conducted a flora and vegetation survey over the additional area in March 2008. Due to the small size and degraded nature of the additional area proposed to be cleared, it is unlikely that it would represent significant habitat for fauna indigenous to Australia (Ecologia, 2008a).

A further amendment to Clearing Permit CPS 2468/2 proposes an increase in the area cleared from 31 to 37 hectares and an amendment to the Clearing Permit boundary to include the original Redmont operations camp. This area is previously disturbed and fauna surveys conducted by Ecologia (2008c and 2008d) did not identify any additional significant fauna habitat associated with the amendment.

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

Methodology Caughley et al., (1986)
SEWPAC (2011)
Ecologia (2007b)
Ecologia (2008a)
Ecologia (2007c)
Ecologia (2008d)
Garnett & Crowley (2000)

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

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

There are no known records of Declared Rare Flora (DRF) or Priority Flora within the proposed clearing area (GIS Database).

A flora and vegetation survey of the application area was completed on the 23 October 2007 by Ecologia (2007a). The objectives of the survey were to document the flora and vegetation of the proposed Redmont camp extension area and to determine whether any species or ecological communities of conservation significance occur in the application area.

A Department of Environment and Conservation (DEC) database search of the application area was undertaken by Ecologia (2007a). Based on habitat preferences and distribution ranges, Ecologia (2007a) considered that 21 Priority flora and one DRF species could potentially occur within the survey area. However, none of these taxa were recorded during the subsequent reconnaissance survey (Ecologia, 2007a).

It should be noted that prior to the flora and vegetation survey being undertaken the majority of the application area was recently burnt from wildfires, as a result, it is likely that many flora species would have been missed that normally would have been recorded (Ecologia, 2007a). Unburnt areas were pockets in the south-western corner and the north and north-eastern corner of the application area (Ecologia, 2007a).

However, a previous flora survey undertaken by Biota in 2004, in association with a rail expansion project, included the Redmont camp extension application area (Ecologia, 2007a). During this flora survey, three Priority flora species were recorded near the application area, including: *Themeda* sp. *Hamersley Station* (Priority 3), *Gonocarpus ephemerus* (Priority 2) and *Bulbostylis burbridgeae* (Priority 3) (Ecologia, 2007). The closest recording was 1.5 kilometres to the north of the Redmont camp, where both *Themeda* sp. *Hamersley Station* and *Gonocarpus ephemerus* were recorded (Ecologia, 2007). There were no DRF or Priority flora recorded within the application area during this survey. However, given that the previous flora survey was undertaken in 2004, and the majority of the application area was burnt prior to the current survey, it is possible that some of these Priority flora species may have since colonised in the application area and were missed.

Themeda sp. *Hamersley Station* is a tussocky perennial, grass-like herb associated with red clay and clay pan type habitats (Western Australian Herbarium, 2008). Given that the majority of the application area is made up of sandy plains rather than clay – clay pans, it is unlikely that the application area would be suitable habitat for this species.

Gonocarpus ephemerus is a procumbent annual or perennial herb that is found in sandy plains and drainage lines (Western Australian Herbarium, 2008). Given that there are sandy plain habitats and a drainage line present within the application area, it is possible that the application area may be suitable habitat for this species. However, the vegetation and habitats found within the application area are well replicated in surrounding areas of the Pilbara (Ecologia, 2007a). Furthermore, this species is widespread over five botanical districts of Western Australia, including: the Gascoyne, Ereman, Little Sandy Desert, Murchison and the Pilbara (Western Australian Herbarium, 2008). Based on this, it is unlikely the proposed clearing will have any significant impact on the conservation status of this species.

Bulbostylis burbridgeae is a tufted, erect to spreading annual, grass-like or herb which is associated with

granitic soils, granitic outcrops and cliff bases (Western Australian Herbarium). Given that there are no granitic outcrop type habitats within the application area (Ecologia, 2007), it is unlikely that the application area is suitable habitat for this species.

Given that there have been no DRF or Priority flora species recorded within the application area during past flora surveys (Ecologia, 2007), and that the vegetation and habitats present are well replicated in the Pilbara, it is unlikely the proposed clearing will have any significant impact on any flora species of conservation significance.

Clearing Permit CPS 2468/1 has been amended to increase the total area to be cleared from 30 to 31 hectares, and to increase the purpose permit boundary by approximately 0.3 hectares. The increase allows for the construction of an access track into the Redmont Camp Extension area. Ecologia (2008a) conducted a flora and vegetation survey over the additional area in March 2008. Due to the small size and degraded nature of the additional area proposed to be cleared, it is unlikely that the vegetation would be necessary for the continued existence of rare flora (Ecologia, 2008a).

A further amendment to Clearing Permit CPS 2468/2 proposes an increase in the area cleared from 31 to 37 hectares and an amendment to the Clearing Permit boundary. Flora surveys conducted by Ecologia (2008a and 2008b) did not identify any DRF or Priority Flora species within the amended application area.

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

Methodology Ecologia (2007a)
Ecologia (2008a)
Ecologia (2008b)
Western Australian Herbarium (2008)
GIS Database:
- Threatened and Priority Flora

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments **Proposal is not likely to be at variance to this Principle**
There are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). There are no known TECs found within the Chichester IBRA Subregion (Kendrick & McKenzie, 2001). The flora and vegetation surveys of the application area did not identify any significant ecological communities within the area proposed to be cleared (Ecologia 2007a; 2008a and 2008b)

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

Methodology Ecologia (2007a)
Ecologia (2008a)
Ecologia (2008b)
Kendrick & McKenzie (2001)
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 of Australia (IBRA) bioregion (Shepherd, 2009). According to Shepherd (2009) there is approximately 100% of pre-European vegetation remaining within this bioregion (see table).

The vegetation of the application area is classified as Beard vegetation association 93 – Hummock grasslands, shrub steppe; kanji over soft spinifex (GIS Database). There is approximately 100% of Beard vegetation association 93 remaining at both the state and bioregional level (Shepherd, 2009). The area proposed to clear does not represent a significant remnant of 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	17,804,193	17,785,000	~ 99.9	Least Concern	6.3
Beard veg assoc. – State					
93	3,044,308	3,044,249	~ 100	Least Concern	0.4
Beard veg assoc. – Bioregion					
93	3,042,112	3,042,063	~ 100	Least Concern	0.4

* Shepherd (2009)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (Regions - Sub-Regions)
- 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 not at variance to this Principle

There is one non perennial watercourse located within the south-western corner of the application area (GIS Database).

The vegetation located within this watercourse is described as: Plain vegetation type 2: Scattered *Hakea lorea* subsp. *lorea* low trees, over sparse *Acacia stellaticeps* and *Pluchea tetranthera* low shrubs, with open mixed tussock and *Triodia epactia* hummock grasses.

Ecologia (2007a) have stated that this vegetation association was not confined to drainage lines and was not riparian in nature.

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

Methodology Ecologia (2007a)
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 is located on a relatively level sandy plain which undulates from the south-east of the application area towards the west-north-west (GIS Database). There are no significant slopes found within the application area (GIS Database).

The majority of the application area is broadly mapped as the Macroy land system, whilst a small portion in the south-east of the application area is described as the Mckay land system and in the south-west as the River Land System (GIS Database).

The Macroy land system is described as stony plains and occasional tor fields based on granite supporting hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). The landform found within the application area is described as Sandy Plains – level sandy surfaced plains with surface mantles absent or as few pebbles of quartz (Van Vreeswyk et al., 2004). This land system has a low or very low erosion potential.

The Mckay land system is described as hills, ridges, plateaux remnants and breakaways of meta sedimentary rocks supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). The south-western corner of the application area is made up of dendritic floors less than 100 metres wide with channels incised in narrow valleys. In upper parts of this land system drainage floors are broader (up to 250 metres wide), whilst channels downstream are up to 50 metres wide (Van Vreeswyk et al., 2004). The land within the application area is located in a downstream area, and has a very low erosion potential (Van Vreeswyk et al., 2004).

The River land system is described as Flood plains and river terraces subject to fairly regular overbank flooding from major channels and watercourses, sandy banks and poorly defined levees and cobble plains. Banks, levees and slightly higher upper terraces receive less regular flooding than lower terraces and flood plains (Van Vreeswyk et al., 2004). Susceptibility to erosion is high or very high if vegetative cover is removed (Vreeswyk et al., 2004).

Based on the topography within the application area, and the low risk of soil erosion associated with the majority of the area to be cleared, it is unlikely the proposed clearing will cause appreciable 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 Databases:
- Hydrography, linear
- Rangeland Land System Mapping
- Topographic Contours, 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 closest conservation area to the application area is the 'Class A' Mungarooona Range Nature Reserve, which is situated approximately 45 kilometres to the west of the area applied to clear (GIS Database). Based on the distance between these two areas, it is unlikely there would be any detrimental effects to the environmental values of the Mungarooona Range Nature Reserve from the proposed clearing.

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 is not likely to be at variance to this Principle

The proposed clearing area is not located within a Public Drinking Water Source Area (GIS Database).

There are no permanent watercourses within the application area (GIS Database). There is one minor ephemeral drainage line which runs through the south-western corner of the application area. This drainage line is dry for most of the year, only flowing briefly immediately following significant rainfall (GIS Database). Given the average annual rainfall (308 millimetres) and average annual evaporation rate (3,200 millimetres), there is little surface water flow during normal seasonal rains (Bureau of Meteorology, 2008; GIS Database). It is therefore unlikely that the proposed clearing will impact upon surface water quality onsite or offsite.

Groundwater occurrence in the application area is generally associated with faults and fracture zones, where locally increased permeability occurs (BHP Billiton, 2008; 2011). The depth of groundwater in the application area is approximately 6 metres below the surface (BHP Billiton, 2008; 2011). Given the low average annual rainfall and high average annual evaporation rate, recharge to the groundwater table is expected to be low (GIS Database). As a result, it is unlikely that the removal of 37 hectares of native vegetation will significantly impact on groundwater levels or quality in the application area.

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

Methodology BHP Billiton (2008)
BHP Billiton (2011)
Bureau of Meteorology (2008)
GIS Databases:
- Evapotranspiration
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

(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 (GIS Database). There is one minor ephemeral drainage line which runs through the south-western corner of the application area. This drainage line is dry for most of the year, only flowing briefly immediately following significant rainfall (GIS Database).

The average annual rainfall for Redmont is approximately 308 millimetres, and years without significant rainfall can occur (Bureau of Meteorology, 2008). The majority of rainfall comes in summer as a result of scattered thunderstorms and the occasional tropical cyclone. The application area experiences an annual evaporation rate of approximately 3,200 millimetres (GIS Database). Based on this, it is likely that if water does collect and pool during heavy rainfall periods it will evaporate quickly.

The application area is situated within the Yule River Catchment which covers an area of approximately 8,860 hectares (GIS Database). Given the small size of the proposed clearing (30 hectares) in relation to the size of the Yule River Catchment (8,860 hectares); it is unlikely that the proposed clearing will significantly increase the incidence or intensity of flooding within the application area (GIS Database).

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

Methodology Bureau of Meteorology (2008).
GIS Database:
- Evapotranspiration
- Hydrographic Catchments

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

Comments

There is one native title claim over the application area (GIS Database). The claim (WC99_016) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). However, the mining 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 is one registered Site of Aboriginal Significance located approximately 180 metres to the south-west of the area applied to clear (Site ID 8777) (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

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

Clearing permit CPS 2468/1 was granted by the Department of Mines and Petroleum on 10 July 2008, and was valid from 9 August 2008 to 1 September 2013. The clearing permit authorised the clearing of 30 hectares of native vegetation.

This Clearing Permit was amended on 24 September 2009 to increase the total area to be cleared from 30 to 31 hectares, and to increase the purpose permit boundary by approximately 0.3 hectares (CPS 2468/2). The increase allowed for the construction of an access track into the Redmont Camp Extension area.

An application for an amendment to clearing permit CPS 2468/2 was submitted by BHP Billiton Iron Ore Pty Ltd on 25 November 2011. The proponent requested a change to the reporting date for the clearing permit from 1 September each year to 1 October each year. BHP Billiton Iron Ore Pty Ltd also requested a change to the Clearing Permit boundary and an increase in the approved area from 31 to 37 hectares. There were no additional environmental impacts as a result of this amendment.

Methodology GIS Databases:
- Aboriginal Sites of Significance
- Native Title Claims

4. References

- BHP Billiton (2008) Redmont Camp Extension Application to Clear Native Vegetation (Purpose Permit) under the *Environmental Protection Act 1986*. Supporting Documentation. February 2008.
- BHP Billiton (2011) Redmont Camp Extension Application to Amend Native Vegetation (Purpose Permit) under the *Environmental Protection Act 1986*. Supporting Documentation. November 2011.
- Caughley G, Grice D, and Short J (1986) Density and Distribution of the Australian Bustard *Ardeotis australis*. *Biological Conservation* 35: 259-267.
- 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.
- SEWPAC (2011) *Merops ornatus* - Rainbow Bee-eater. URL: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=670
- Ecologia (2007a) Rapid Growth Project 5 Redmont Camp Extension Flora and Vegetation Survey. Unpublished report for BHP Billiton Iron Ore.

- Ecologia (2007b) Redmont / Cowra Camp and Borrow Areas Fauna Survey. Unpublished report for BHP Billiton Iron Ore.
- Garnett, S.T., & Crowley, G.M. (2000) The Action Plan for Australian Birds. Department of the Environment and Water Resources, URL:
<http://www.environment.gov.au/biodiversity/threatened/publications/action/birds2000/pubs/australian-bustard.pdf>
- Ecologia (2008a) Rapid Growth Project 5 (RGP5) Quarry Four Lease, Flora and Vegetation Report Version 2. Unpublished report for BHP Billiton Iron Ore Pty Ltd
- Ecologia (2008b) Redmont Camp Extension Flora and Vegetation Survey Unpublished report for BHP Billiton Iron Ore Pty Ltd
- Ecologia (2008c) RGP5 Fauna Survey: Quarry 4 Unpublished report for BHP Billiton Iron Ore Pty Ltd
- Ecologia (2008d) RGP5 Targeted Survey: Quarry 1, 2, 4 and East Turner River Northern Quoll Survey Unpublished report for BHP Billiton Iron Ore Pty Ltd
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Kendrick, P & McKenzie, N (2001) Pilbara 1 (PIL 1 Chichester Subregion) Subregional description and biodiversity values in "A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002" published by the Department of Conservation and Land management 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.
- Western Australian Herbarium (1998-). FloraBase — The Western Australian Flora. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/>
- Van Vreeswyk, A.M.E., & Payne, A.L. & Leighton, K.A. & Hennig, P (2004) An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, Western Australia.

5. 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.