



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2978/2
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Mineral Lease 4SA (AML 70/4)
Iron Ore (Hamersley Range) Agreement Act 1963
Local Government Area: Shire of Ashburton
Colloquial name: Beasley River Evaluation Drilling Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
79.1		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 Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Two Beard vegetation associations are located within the application areas (GIS Database):

82: Hummock Grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

567: Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii*.

The application area covers five individual mesas. A vegetation and flora survey was conducted over each mesa between May 2008 and October 2008 (Rio Tinto Iron Ore, 2009). Vegetation types were described for each mesa:

MESA 1

Mesa Top

M1V1: Mesa Top High Shrubland: *Eucalyptus leucophloia* low open forest over *Acacia aneura* & *Acacia pruinocarpa* high shrubland over *Acacia atkinsiana* & *Senna pruinosa* open heath over *Triodia pungens* hummock grassland.

M1V2: Mesa Top Low Woodland: *Eucalyptus leucophloia* low woodland over *Acacia pruinosa*, *A. aneura*, *A. bivenosa* & *A. atkinsiana* high shrubland over *Triodia pungens* hummock grassland.

M1V3: Mesa Top Low Woodland: *Eucalyptus leucophloia* low woodland over *Acacia pruinocarpa* high shrubland over *A. bivenosa* & *A. synchronicia* shrubland over *A. maitlandii* & *Senna glutinosa* low open shrubland over *Triodia pungens* hummock grassland.

Slopes

M1V4: Slight Slope Open Woodland: *Eucalyptus leucophloia* low open woodland over *Acacia aneura* & *A. pruinocarpa* open scrub over *A. ancistrocarpa*, *Petalostylis labicheoides* & *A. pyrifolia* open heath over *Eremophila forrestii* low open shrubland over *Triodia wiseana* hummock grassland.

M1V5: Slight Slope Low Open Woodland: *Eucalyptus leucophloia* low open woodland over *Acacia pruinocarpa*, *A. synchronicia* & *A. inaequilatera* open scrub over *A. bivenosa*, various *Senna* spp. open shrubland over *Triodia pungens* hummock grassland.

Drainage Lines

M1V6: Drainage Line Low Open Woodland: *Eucalyptus leucophloia*, *E. xerothermica* & *Corymbia hamersleyana* low open woodland over *Acacia citrinoviridis* & *A. pyrifolia* high shrubland over *Petalostylis labicheoides* & *A. ancistrocarpa* open heath over *Triodia pungens* hummock grassland over *Eriachne tenuiculmis*, *Themeda triandra* & *Cymbopogon ambiguus* tussock grassland.

Mesa Edges, Gorges

M1V7 - Mesa Edge: Gorge Low Open Forest: *Eucalyptus leucophloia*, *Corymbia ferritcola*, *Acacia aneura* & *A. citrinoviridis* low open forest over *Senna glutinosa*, *Petalostylis labicheoides* & *Senna oligophylla* low open shrubland over *Triodia pungens* open hummock grassland over *Eriachne mucronata* & *Eriachne tenuiculmis* open tussock grassland.

MESA 2

Mesa Top, Hills and Slopes

M2V1: Mesa Top Low Open Woodland: *Eucalyptus leucophloia* & *Corymbia ferritcola* low open woodland over *Acacia pruinocarpa* & *Gossypium robinsonii* high shrubland over *Senna pruinosa* open shrubland over *Triodia pungens* hummock grassland over *Eriachne mucronata* very open tussock grassland.

M2V2: Mesa Top Low Open Woodland: *Eucalyptus leucophloia* low open woodland over *Acacia aneura* & *A. pruinocarpa* open scrub over *Eremophila forrestii* open shrubland over various *Sida* spp. *Senna notabilis* & *Corchorus sidoides* low shrubland over *Triodia wiseana* & *Triodia pungens* hummock grassland.

M2V3: Mesa Top Low Woodland: *Eucalyptus leucophloia* low woodland over *Acacia pruinocarpa*, *A. atkinsiana* & *Petalostylis labicheoides* open scrub over *Corchorus lasiocarpus* ssp. *parvus* low open shrubland over *Triodia pungens* & *T. wiseana* hummock grassland over *Amphipogon caricinus* tussock grassland.

M2V4: Mesa Top, Rolling Hills Low Open Forest: *Eucalyptus leucophloia* & *E. gamophylla* low open forest over *Acacia citrinoviridis* & *A. aneura* high open shrubland over *Petalostylis labicheoides* & *Senna glutinosa* open shrubland over *Indigofera monophylla* & *Corchorus lasiocarpus* spp. *parvus* low open shrubland over *Triodia wiseana* open hummock grassland.

M2V5: Mesa Top, Lower Marra Mamba Slope High Shrubland: *Eucalyptus leucophloia* low open woodland over *Acacia pruinocarpa* & *A. aneura* high shrubland over *A. atkinsiana* & *Senna glutinosa* open heath over *Triodia pungens* hummock grassland.

M2V6: Mesa Top, Lower Marra Mamba Slope High Shrubland: *Hakea lorea* low open woodland over *Acacia pruinocarpa* & *A. aneura* high shrubland over *A. atkinsiana*, *A. bivenosa*, *A. synchronicia* & *Petalostylis labicheoides* open heath over *Triodia wiseana* hummock grassland.

Mesa Edges, Gorges & Gullies

M2V7: Mesa Edge High Open Shrubland: *Eucalyptus leucophloia* low open forest over *Acacia pruinocarpa* & *A. synchronicia* high open shrubland over *A. ancistrocarpa*, *A. atkinsiana* & *Senna pruinocarpa* open shrubland over *Corchorus lasiocarpus* spp. *parvus* low open shrubland over *Triodia pungens* open hummock grassland over *Amphipogon caricinus* tussock grassland.

M2V8: Small Gorge Low Open Woodland: *Acacia citrinoviridis*, *Corymbia ferritcola* & *Grevillea berryana* low open forest over *Dodonaea pachyneura* high shrubland over *Eremophila forrestii* low open shrubland over *Triodia pungens* very open hummock grassland over *Eriachne mucronata* open tussock grassland.

Drainage Lines

M2V9: Drainage Line Low Woodland: *Eucalyptus leucophloia* & *Corymbia hamersleyana* low woodland over *petalostylis labicheoides* & *Acacia pruinocarpa* open scrub over *Senna glutinosa* & *A. atkinsiana* shrubland over *Corchorus lasiocarpus* spp. *parvus* low open shrubland over *Triodia pungens* hummock grassland over *Amphipogon caricinus* very open tussock grassland.

MESA 3

Mesa Top

M3V1: Mesa Top Low Woodland: *Eucalyptus leucophloia* & *Codonocarpus cotinifolius* low woodland over *Senna glutinosa* & *Senna pruinosa* open shrubland over *Corchorus lasiocarpus*, *Solanum lasiophyllum* & *Sida cardiophylla* low shrubland over *Triodia pungens* open hummock grassland.

M3V2: Mesa Top Low Woodland: *Eucalyptus leucophloia*, *Acacia aneura* & *A. pruinocarpa* low woodland over *Eremophila forrestii* shrubland over *Triodia pungens* hummock grassland.

M3V3: Mesa Top Low Woodland: *Eucalyptus leucophloia*, *Hakea lorea* & *Acacia pruinocarpa* low woodland over *A. atkinsiana* & *A. bivenosa* open scrub over *Triodia pungens* closed hummock grassland.

Mesa Top/Slope

M3V4: Mesa Top, Slight Slope Low Woodland: *Eucalyptus leucophloia* & *Acacia pruinocarpa* low woodland over *A. ancistrocarpa*, *A. atkinsiana*, *A. marramamba* & *A. pyrifolia* open scrub over *Triodia wiseana* & *T. pungens* hummock grassland.

Mesa Edge and Cliffs

M3V5: Mesa Edge Low Woodland: *Eucalyptus leucophloia* & *Acacia aneura* low woodland over *Petalostylis labicheoides* & *A. monticola* shrubland over *Harnieria kempeana* spp. *muelleri* low shrubland over *Triodia pungens* open hummock grassland over *Cymopogon ambiguus* & *Eriachne mucronata* open tussock grassland.

M3V6: Below Cliff Low Woodland: *Eucalyptus leucophloia*, *Acacia aneura* & *A. pruinocarpa* low woodland over *Triodia wiseana* open hummock grassland over *Eriachne mucronata* open tussock grassland.

MESA 4

Mesa Top

M4V1: Mesa Top, Crabhole Country Shrubland: *Acacia xixophylla* open scrub over *Senna oligophylla*, *Senna hamersleyensis* & *Eremophila exilis* shrubland over *Sida fibulifera* low open shrubland over *Streptoglossa bubakii*, various herbs over *Eragrostis xerophila* very open tussock grassland over various grasses, very open bunch grassland.

M4V2: Mesa Top High Shrubland: *Acacia citrinoviridis* high shrubland over *Petalostylis labicheoides* open heath over *Triodia pungens* hummock grassland.

M4V3: Mesa Top Low Woodland: *Eucalyptus leucophloia* & *Acacia pruinocarpa* low woodland over *Petalostylis labicheoides*, *Acacia bivenosa* & *Acacia maitlandii* high shrubland over *Senna glutinosa* open shrubland over *Senna helmsii*, *Solanum lasiophyllum* & *Corchorus lasiocarpus* low open shrubland over *Triodia pungens* hummock grassland.

M4V4: Mesa Top Low Woodland: *Acacia aneura*, *A. pruinocarpa* & *Eucalyptus leucophloia* low woodland over *A. atkinsiana* open scrub over *Senna glutinosa* open shrubland over *Triodia pungens* hummock grassland.

M4V5: Mesa Top Low Woodland: *Eucalyptus leucophloia*, *Codonocarpus cotinifolius* & *Acacia pruinocarpa* low woodland over *A. bivenosa* high open shrubland over *Senna glutinosa* & *S. luerssenii* open shrubland over *Tribulus suberosus* & *Solanum lasiophyllum* low open shrubland over *Triodia pungens* hummock grassland.

M4V6: Mesa Top Low Open Woodland: *Corymbia hamersleyensis*, *Acacia aneura* & *A. pruinocarpa* low open forest over *A. bivenosa* high shrubland over *Senna luerssenii* & *S. glutinosa* open shrubland over *S. oligophylla* low shrubland over *Triodia pungens* open hummock grassland.

M4V7: Mesa Top Low Open Forest: *Eucalyptus leucophloia*, *Acacia aneura* & *A. pruinocarpa* low open forest over *A. bivenosa* high open shrubland over *Eremophila forrestii* open shrubland over *Triodia pungens* hummock grassland.

M4V8: Mesa Top, Mulga Low Open Forest: *Acacia aneura*, *A. pruinocarpa* & *Grevillea berryana* low open forest over *Eremophila forrestii* shrubland over *Triodia pungens* hummock grassland.

Mesa Edge/Slope

M4V9: Edge of West Slope Low Open Woodland: *Eucalyptus leucophloia* & *Acacia aneura* low open woodland over *Senna pruinosa* open shrubland over *Triodia pungens* hummock grassland over *Amphipogon caricinus* tussock grassland.

MESA 5

Mesa Top

M5V1: Mesa Top Low Woodland: *Eucalyptus leucophloia*, *Codonocarpus cotinifolius*, *Acacia pruinocarpa* & *A. aneura* low woodland over *Senna pruinosa* open shrubland over *Keraudrenia velutina* low open shrubland over *Triodia pungens* open hummock grassland.

M5V2: Mesa Top Low Open Forest: *Eucalyptus leucophloia*, *Acacia aneura* & *A. pruinocarpa* low open forest over *Senna glutinosa* open shrubland over *Triodia pungens* closed hummock grassland.

M5V3: Mesa Top Low Open Forest: *Acacia aneura*, *A. pruinocarpa* & *Eucalyptus leucophloia* low open forest over *Senna luerssenii* open shrubland over *Eremophila forrestii* & *E. exilis* low open shrubland over *Triodia pungens* hummock grassland.

M5V4: Mesa Top Low Open Forest: *Eucalyptus leucophloia*, *A. aneura* & *A. pruinocarpa* low open forest over *Senna pruinosa* & *S. glutinosa* open shrubland over *Triodia pungens* hummock grassland.

M5V5: Mesa Top Low Open Forest: *Acacia aneura*, *Eucalyptus leucophloia* & *Grevillea berryana* low open forest over *Eremophila forrestii* open heath over *Triodia pungens* open hummock grassland.

Clearing Description	Hamersley Iron Pty Ltd has applied to clear up to 79.1 hectares of native vegetation within an application area of 618 hectares for the purpose of mineral exploration (resource drilling). The proponent has advised that the proposed clearing will be for drill lines (52.9 kilometres by 3.5 metres), up to 1,587 drill pads (26 metres by 17 metres) and associated sumps (Hamersley Iron Pty Ltd, 2009). Vegetation will be cleared using raised blade techniques, or scrub rake in level terrain. The vegetation and topsoil will be collected and stockpiled for use in future rehabilitation (Hamersley Iron Pty Ltd, 2009).
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994) To Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).
Comment	Clearing Permit CPS 2978/1 was granted by the Department of Mines and Petroleum (DMP) on 28 May 2009 and authorised the clearing of up to 79.1 hectares of native vegetation within an area totalling approximately 618 hectares. Hamersley Iron Pty Ltd applied to DMP on 1 February 2010 to amend clearing permit CPS 2978/1 to extend the timeframe to complete rehabilitation activities from 6 months to 12 months following clearing. The area of authorised clearing and the clearing area boundary that was approved under clearing permit CPS 2978/1 will remain unchanged.

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal may be at variance to this Principle

The application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion which encompasses an area of 17,804,164 hectares (GIS database; Shepherd et al., 2001). The Hamersley subregion is characterised by sedimentary ranges and plateaux, dissected gorges, low Mulga woodlands over bunch grasses in valley floors and Eucalypt woodlands over *Triodia* spp. on skeletal soils of the ranges (Kendrick, 2001). The mountain tops, gorges and upper slopes throughout the subregion provide refuge from fire for a large number of restricted flora species and native fauna species and the extensive ranges comprise of a high diversity of *Acacia*, *Triodia*, *Ptilotus*, *Corymbia* and *Sida* species (Kendrick, 2001).

The application areas are located approximately 55 kilometres west of Tom Price and covers 5 mesas (Mesas 1, 2, 3, 4 and 5) (Rio Tinto Iron Ore, 2009; GIS Database). The application areas are located on a landform feature that is known to provide significant refuge for restricted native flora and fauna species (Kendrick, 2001). Mesa land formations are abundant in the Tom Price locality and form an extensive landform feature throughout much of the western Pilbara. There is an extensive distribution of similar landform features throughout the Pilbara region.

A botanist from Rio Tinto carried out a flora survey of the vegetation within Beasley River study area which included the application areas. A total of 269 flora species from 118 genera and 49 families were recorded from the entire Beasley River study area (Rio Tinto Iron Ore, 2009). The number of flora taxa recorded from mesa 1, 2, 3, 4 and 5 (representing the application areas) is provided (Rio Tinto Iron Ore, 2009):

- **Mesa 1:** 94 species, from 50 genera and 31 families;
- **Mesa 2:** 118 species, from 60 genera and 35 families;
- **Mesa 3:** 149 species, from 78 genera and 41 families;
- **Mesa 4:** 136 species, from 68 genera and 35 families; and
- **Mesa 5:** 115 species, from 62 genera and 35 families.

The number of flora species recorded throughout the entire project area, and on each mesa is considered biologically diverse. However, this is considered typical of the floristic diversity for similar landform features throughout the Pilbara region.

An area search of the Department of Environment and Conservation's Nature Map database, representing a 40 kilometre radius, was undertaken to identify the potential faunal diversity of the application area. One amphibian, 25 avian, 16 mammalian and 66 reptilian species may potentially occur within the application (Department of Environment and Conservation, 2007). The database search suggests that the application area is diverse in reptile species, particularly skinks (24) (Department of Environment and Conservation, 2007).

Two introduced flora species (weeds), Buffel Grass (*Cenchrus ciliaris*) and Purslane (*Portulaca loeracea*), were recorded within the application areas (Rio Tinto Iron Ore, 2009). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. The disturbance of soil may promote weed growth, and there is a risk that the movement of contaminated soil and clearing equipment throughout the project areas may cause the spread of weed species. The Assessing Officer recommends that should the permit be granted, conditions be imposed on the permit for the purpose of weed management.

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

Based on the above, the proposed clearing may be at variance this Principle. The assessing officer recommends that should a permit be granted, a condition be imposed on the permit for the purpose of weed management.

Methodology

Department of Environment and Conservation (2007)
Kendrick (2001)
Rio Tinto Iron Ore (2009)
Shepherd et al. (2001)
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- Interim Biogeographic Regionalisation of Australia (subregions)
- Pre-European Vegetation

(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

A search of the Department of Environment and Conservation's (DEC) Nature Map database was undertaken by the assessing officer using the coordinates 22°38'19"S and 117°14'29"E, thereby representing a 40

kilometre radius area. In addition, Hamersley Iron Pty Ltd (2009) requested the DEC to conduct a co-ordinate search of its threatened fauna database to identify species of conservation significance that had been recorded within the area specified. The co-ordinates supplied by Hamersley are similar to those used by the assessing officer above.

This search identified 1 Amphibian, 25 Avian, 16 Mammalian and 66 Reptilian species that may occur within the application area (Department of Environment and Conservation, 2007). Of these, the following species of conservation significance have previously been recorded within the search area: Ghost Bat (*Macroderma gigas*), Western Pebble-mound Mouse (*Pseudomys chapmani*), Long-tailed Dunnart (*Sminthopsis longicaudata*), Lakeland Downs Mouse (*Leggadina lakedownensis*), Australian Bustard (*Ardeotis australis*), Bush Stone-curlew (*Burhinus grallarius*), Striated Grasswren (*Amytornis striatus striatus*) and a skink (*Notoscincus butleri*).

The Ghost Bat (DEC - Priority 4) is known to show preference for large, deep caves, crevices and old underground mining workings (Australian Museum Online, 1999), and is distributed in Western Australia, throughout the western half of the Pilbara, and throughout the Kimberley including the Buccaneer Archipelago Islands (The Australian Museum Trust/Queensland Museum, 2008). One of the main conservation threats to the Ghost Bat is the loss of feeding habitat by clearing (Australian Museum Online, 1999). The application area covers five mesas and includes landforms such as mesa tops and edges, gorges, gullies, rolling hills, woodlands and drainage lines (Rio Tinto Iron Ore, 2009). There is the potential that the gorge, gully and breakaway areas may comprise of suitable sized crevices that may provide habitat for the Ghost Bat. However, given its widespread distribution throughout the Pilbara and Kimberley region, the area is unlikely to represent significant habitat for this species.

The Western Pebble-mound Mouse (DEC - Priority 4) is relatively widespread and abundant throughout much of the Pilbara 3 subregion, and parts of the Gascoyne (Kendrick, 2001; Australian Museum Trust/Queensland Museum, 2008). The species occurs on spinifex covered, gentle colluvial slopes with pebbles of size (approximately 3.5 grams) suitable for the transport and construction of pebble mounds (Australian Museum Trust/Queensland Museum, 2008). The species is found in many locations throughout the Pilbara region including Karijini National Park, located approximately 70 kilometres east of the application area. Nine pebble mounds were recorded within the application area on mesas 2, 3, 4 and 5 (Rio Tinto Iron Ore, 2009). The vegetation within the application area may support habitat for this species, however, the proposed clearing is unlikely to impact on the availability significant habitat for this species.

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

The Lakeland Downs Mouse (DEC - Priority 4) is known from a broad distribution across the Pilbara and Kimberley regions of Western Australia (Australian Museum Trust/Queensland Museum, 2008). The species is known to occur on sandy soils and cracking clays that support grasslands (Department of Environment and Conservation, 2008), and its populations are known to fluctuate dramatically annually (Australian Museum Trust/Queensland Museum, 2008). The soil types within the application area appear to consist of stony surfaces and mantles which are unlikely to provide suitable habitat for this species (Van Vreeswyk et al.). The proposed clearing is unlikely to impact on significant habitat for the Lakeland Downs Mouse.

The Australian Bustard (DEC - Priority 4) is known to inhabit open or lightly wooded grasslands including sandplains with *Triodia* species, and also chenopod flats and plains and low heathland environments (Johnstone and Storr, 1998). The species is known to be nomadic, with irregular widespread movements over long distances (Johnstone and Storr, 1998; Department of Environment and Climate Change NSW, 2008). This species may occur within the application area, however, given the widespread distribution and nomadic nature of this species, the vegetation and landforms within the application area is unlikely to represent significant habitat for this species.

The Bush Stone-curlew (DEC - Priority 4) is known to inhabit grassy woodlands, and also partly cleared forests and farmlands (Johnstone and Storr, 1998). This species may occur within the application area, however, given the widespread distribution of this species, it is not likely that the Bush Stone-curlew is dependent upon the vegetation within the application area for its continued existence in the local area. The vegetation is not likely to represent significant habitat for this species.

Striated Grasswrens (DEC - Priority 4) are known to occur on sandy or loamy plains dominated by *Triodia* species, and also on sandridges and interdunes that comprise of *Acacia ligulata* and *A. aneura* with *Triodia* species (Johnstone and Storr, 1998). Vegetation mapping indicates that there are large expanses of *Triodia* hummock grassland throughout the Pilbara region which this species can utilise (GIS Database; Shepherd et al., 2001). The vegetation is not likely to represent significant habitat for this species.

Notoscincus butleri (DEC Priority 4) is species of skink that occurs in stony areas dominated by spinifex ground cover and is confined to the arid north-west (Department of Environment and Conservation, 2009). The vegetation within the application area may be suitable habitat for this species, however, given the large

amounts of suitable habitat within the Pilbara region, the vegetation within the application area is not likely to be significant habitat for this species.

Based on the results from the database searches, the vegetation and landform units that have been identified within the application areas are likely to provide suitable habitat for fauna species indigenous to Western Australia, including those conservation significant species described above. However, land system information provided by Van Vreeswyk et al. (2004) and subregional information by Kendrick (2001) indicates that the vegetation communities and landform features appear to be common and widespread throughout the Pilbara region.

The proposed infill exploration activities within the application areas are likely to adversely impact on the local environment by causing a moderate degree of habitat fragmentation within the application area.

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

Australian Museum Online (1999)
Department of Environment and Climate Change NSW (2008)
Department of Environment and Conservation (2007)
Department of Environment and Conservation (2008)
Department of Environment and Conservation (2009)
DNREA (2007)
Hamersley Iron Pty Ltd (2009)
Johnstone and Storr (1998)
Kendrick (2001)
Shepherd et al. (2001)
Rio Tinto Iron Ore (2009)
The Australian Museum Trust/Queensland Museum (2008)
Van Vreeswyk et al. (2004)

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

Comments Proposal may be at variance to this Principle

According to available datasets there are no known records of Declared Rare Flora (DRF) within the application areas (GIS Database).

A vegetation and flora survey of the application areas and surrounding vegetation was undertaken by a botanist from Rio Tinto between May and October 2008 (Rio Tinto Iron Ore, 2009). No species of DRF were recorded within the application areas (Rio Tinto Iron Ore, 2009).

Two Priority Flora species were recorded within the application areas. These species are:

- *Ptilotus subspinescens* (Priority 3); and
- *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) (Priority 3).

Ptilotus subspinescens is a compact shrub to 0.8 metres high that is found in gentle rocky slopes, screes and bases of screes (Western Australian Herbarium, 1999 - 2009). This species is only known from the Brockman region (Rio Tinto Iron Ore, 2009). Forty-seven previously unknown populations totalling several thousand individuals were recorded in the Beasley River study area which included the vegetation within the application areas (Mesas 1, 2, 3, 4 and 5) (Rio Tinto Iron Ore, 2009). Population sizes range from a single plant to in excess of 500 plants (Rio Tinto Iron Ore, 2009).

Rio Tinto Iron Ore (2009) has recorded the location of each of the populations of *Ptilotus subspinescens* and only 5 populations occur within the application areas. Two populations were recorded within the application area for Mesa 1, whilst 3 populations were recorded within the application area for Mesa 3 (Rio Tinto Iron Ore, 2009). Rio Tinto Iron Ore (2009) estimate approximately 550 individuals of *Ptilotus subspinescens* occur within these five populations. The largest population contains up to approximately 500 individuals and is located on the eastern boundary of mesa 3 (Rio Tinto Iron Ore, 2009; GIS Database). Given that clearing for drill pads will be restricted to 26 metres by 17 metres (and associated sumps 8 metres by 3.5 metres) and that drill pads will be spaced 50 metres apart, it is not likely that this population would be significantly impacted by the proposed clearing activities.

The majority of the application areas are located on the top of mesas (mesas 1, 2, 3, 4 and 5) which is unlikely to provide significant habitat for this species (Rio Tinto Iron Ore, 2009; GIS Database). Rio Tinto Iron Ore (2009) has recorded several thousand individuals of *Ptilotus subspinescens* across 42 populations outside of the application areas, and these populations will not be impacted on by the proposed exploration activities. Whilst there is the potential for some disturbance to the 5 populations that have been recorded within the application areas for Mesas 1 and 3, the proposed clearing for exploration activities are unlikely to impact on significant habitat that is required for the continued existence for this species.

Oldenlandia sp. Hamersley Station (A.A. Mitchell PRP 1479) is a spreading annual herb growing to 0.05 to 0.1 metres high that is found on cracking clay and basalt on gently undulating plains with large surface rocks, flats or gilgai plains (Western Australian Herbarium, 1999 - 2009). One population of this species was recorded within the Mesa 4 application area (Rio Tinto Iron Ore, 2009). Additional information provided by Hamersley

Iron Pty Ltd (2009) states that this population contained 50 to 100 plants in an area of 20 metres by 100 metres (Hamersley Iron Pty Ltd, 2009). No other populations were recorded during the flora survey of the application areas or Beasley River study area (Rio Tinto Iron Ore, 2009). In reference to *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479), Hamersley Iron Pty Ltd (2009) state that “we will therefore put an internal exclusion zone around the Mesa 4 population”.

Based on the above, the proposed clearing may be at variance to this Principle. The assessing officer recommends that should a permit be granted, a condition be imposed on the permit for the purpose of Priority Flora management for *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479).

Methodology Hamersley Iron Pty Ltd (2009)
Rio Tinto Iron Ore (2009)
Western Australian Herbarium (1998 - 2009)
GIS Database:
- Declared Rare and Priority Flora List

(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 records of Threatened Ecological Communities (TEC's) within the application areas (GIS database). The nearest known TEC is located approximately 34 kilometres north of the application areas (GIS database). The botanist from Rio Tinto has confirmed that none of the vegetation communities recorded within the application areas represents a TEC or Priority Ecological Community (Rio Tinto Iron Ore, 2009).

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

Methodology Rio Tinto Iron Ore (2009)
GIS Database:
- Threatened Ecological Communities

(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 clearing application area falls within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) region in which approximately 99.95% of the pre-European vegetation remains (see table) (GIS database; Shepherd et al., 2001).

The vegetation of the clearing application area has been mapped as Beard Vegetation Association 82: Hummock grasslands, shrub steppe; *Grevillea refracta* & *Hakea* over soft Spinifex and 567: Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii* (GIS Database, Shepherd et al., 2001). According to Shepherd et al., (2001) approximately 100% of Beard vegetation associations 82 and 567 remains at both the state and bioregional level (see table).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,187.89	17,794,646.75	~99.95%	Least Concern	~6.32%
Beard veg assoc. – State					
82	2,565,901	2,565,901	~100%	Least Concern	~10.2%
567	777,507	777,507	~100%	Least Concern	~22.3%
Beard veg assoc. – Bioregion					
82	2,565,583	2,563,583	~100%	Least Concern	~10.2%
567	776,824	776,824	~100%	Least Concern	~22.4%

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

According to the Bioregional Conservation Status of Ecological Vegetation Classes, the conservation status for the Pilbara Bioregion and Beard Vegetation Association 82 and 567 is of 'Least Concern' (Department of Natural Resources and Environment, 2002) (see table).

While a small to moderate percentage of the vegetation types within the Pilbara bioregion are protected within conservation reserves, the bioregion remains largely uncleared. As a result, the conservation of the vegetation associations within the bioregion is not likely to be impacted on by this proposal.

The vegetation under application is not a remnant of 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 (2007)
GIS Database:
- Interim Biogeographic Regionalisation of Australia (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

There are no permanent wetlands or watercourses within the application areas (GIS Database). The application areas are located on the top of mesa land formations and as a result there are no major rivers, lakes, swamps, marshes or wetlands within the application area (Rio Tinto Iron Ore, 2009). Several ephemeral creek systems and an upper slope drainage line have been recorded within the application area (GIS database). These creek systems largely act as minor drainage lines and are widespread across the Pilbara region.

As there are watercourses within the application area, the proposed clearing is at variance to this Principle. These watercourses are minor, natural drainage channels that are widespread across the Pilbara landscape (GIS database), and are responsible for quickly dispersing floodwaters after significant rainfall events. The vegetation communities growing in association with the watercourses are not unique and are considered common and widespread in the Pilbara bioregion (Shepherd et al., 2001; GIS Database). The proposed clearing is unlikely to significantly impact on vegetation communities growing in association with these minor ephemeral creek systems.

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

Methodology Rio Tinto Iron Ore (2009)
Shepherd et al. (2009)
GIS Database:
- Hydrography, linear_1

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

Comments Proposal may be at variance to this Principle

According to the Department of Agriculture's Technical Bulletin No. 92 "An inventory and condition survey of the rangelands of the Pilbara Region, Western Australia", the application area is predominately comprised of the Robe Land System (GIS Database; Van Vreeswyk et al., 2004). Rangeland Land System mapping indicates that minor sections of the application area are comprised of the Rocklea Land System (GIS Database; Van Vreeswyk et al., 2004).

- The Robe Land System is characterised by low limonite mesas and buttes supporting soft spinifex grasslands (Van Vreeswyk et al., 2004). Assessment of topographic information and satellite imagery indicates that the majority of the application areas are likely to occur on the landform units 'low plateaux, mesas and buttes' which is characterised by stony soils and shallow gravel soils, and some 'lower slopes' which are characterised by red shallow loams and minor calcareous shallow loams (Van Vreeswyk et al., 2004). This land system is not generally susceptible to vegetation degradation or erosion (Van Vreeswyk et al., 2004). There is the possibility that the disturbance of vegetation and surface mantles by exploration activities may promote erosion.
- The Rocklea Land System is characterised by basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). Assessment of topographic information and aerial imagery indicates that the portions of the application area within this land system are likely to occur on the landform units 'hills, ridges, plateaux and upper slopes' which is characterised by stony soils, red shallow loams and calcareous shallow loams, and 'lower slopes' which is characterised by red shallow loams and red shallow sandy duplex soils (Van Vreeswyk et al., 2004). This land system has very low erosion hazard (Van Vreeswyk et al., 2004). The disturbance of vegetation and surface mantles by exploration activities may promote erosion.

Hamersley Iron Pty Ltd has applied to clear up to 79.1 hectares of native vegetation within an application area of approximately 618 hectares for the purpose for resource evaluation drilling (Hamersley Iron Pty Ltd, 2009).

The extent of the drilling program is likely to disturb and fragment the vegetation within the application area. To minimise the risk of soil erosion and further land degradation within the application area, the assessing officer recommends that should the permit be granted, conditions be imposed on the permit for the purpose of rehabilitation.

The application area is located within the Robe River catchment which covers a total area of approximately 757,138 hectares (GIS Database). Groundwater salinities within the application area and adjoining areas have been recorded in the range of 500 - 1,000 milligrams/Litre Total Dissolved Solids (GIS Database). With the application area located on the top of a mesa landform, there is likely to be a considerable depth to ground water which would minimise the risk of salinisation caused by the rising of saline ground water tables. The proposed clearing is unlikely to cause land salinisation either on-site or off-site.

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

Methodology Hamersley Iron Pty Ltd (2009)
Van Vreeswyk et al. (2004)
GIS Database:
- Groundwater Salinity, Statewide
- Rainfall, Mean Annual
- Evaporation Isopleths
- 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 application areas are not located within a Department of Environment and Conservation managed conservation area (GIS Database). The nearest conservation area is Karijini National Park which is located approximately 65 kilometres east of the application areas (GIS database). The proposed clearing is not likely to impact on the conservation values of Karijini National Park.

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

(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

There are no permanent watercourses or wetlands within the application areas (GIS Database). Numerous non-perennial watercourses are distributed across the landscape and these are responsible for quickly dispersing floodwaters after significant rainfall events. The land systems associated with the application areas have high resistance to erosion, however, disturbance of soil mantles may promote soil erosion which may subsequently heighten the risk of sediments being washed away following significant rainfall events (Van Vreeswyk et al., 2004). The land adjoining the cleared drill pads and access tracks will remain vegetated, thereby reducing the risk of sediment export from which may result in sedimentation and turbidity in any ?off-site? watercourses. The proposed clearing is unlikely to cause deterioration in the quality of surface water in the local area.

The application areas are not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Millstream Water Reserve which is located approximately 40 kilometres north-east of the application areas (GIS Database). Given the distance separating the application areas and the nearest water supply areas, the proposed clearing is unlikely to impact on the water quality of the Millstream Water Reserve.

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:
- Public Drinking Water Source Areas (PDWSAs)
- Hydrography, linear_1

(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

Paraburdoo which is situated approximately 71 kilometres south-east of the application area experiences mean annual rainfall of approximately 283.8 millimetres, with the majority of rainfall received between December and May (Bureau of Meteorology, 2009). Local flooding can be expected to occur seasonally in the Pilbara region as a result of heavy rainfall triggered by cyclonic activity and sporadic thunderstorms. The Pilbara landscape is

characterised by an abundance of ephemeral watercourses which are responsible for quickly dispersing floodwaters after significant rainfall events, thereby reducing peak flood heights (GIS database).

The application area is situated within the Ashburton River Catchment which covers a total area of approximately 7,877,743 hectares (GIS Database). The application area is located across 5 mesa land formations (Rio Tinto Iron Ore, 2009). Topographic information indicates that there are no low lying areas or permanent wetlands or watercourses within the application areas (GIS Database). It is unlikely that the proposed clearing for drill pads and access tracks would create a catchment area that would significantly increase surface water runoff to low lying areas, or impact on the drainage patterns in the local area. The proposed clearing of native vegetation is unlikely to cause or increase the incidence of flooding or result in an increase in peak flood height.

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

Methodology Bureau of Meteorology (2009)
Rio Tinto Iron Ore (2009)
GIS Database:
- Topographic Contours, Statewide
- Hydrography, linear_1
- Hydrographic Catchments - Catchments

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

Comments

There is one Native Title Claim over the area under application (WC01/005). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Sites of Aboriginal Significance within the area applied to clear (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process. Hamersley Iron Pty Ltd have advised that heritage surveys will be undertaken and that any sites identified will be avoided, or a section 18 licence will be applied for.

One direct interest submission was received during the public submissions period stating no objection to the proposal.

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 2978/1 was granted by the Department of Mines and Petroleum (DMP) on 28 May 2009 and authorised the clearing of up to 79.1 hectares of native vegetation within an area totalling approximately 618 hectares. Hamersley Iron Pty Ltd applied to DMP on 1 February 2010 to amend clearing permit CPS 2978/1 to extend the timeframe to complete rehabilitation activities from 6 months to 12 months following clearing. The area of authorised clearing and the clearing area boundary that was approved under clearing permit CPS 2978/1 will remain unchanged.

Methodology Hamersley Iron Pty Ltd (2009)
GIS Database
- Native Title Claims
- Sites of Aboriginal Significance DIA

4. Assessor's comments

Comment

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

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

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6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DMP	Department of Mines and Petroleum, 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.