



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 4859/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

### 1.3. Property details

Property: Iron Ore (Mount Bruce) Agreement Act 1972, Mineral Lease 252SA (AML 70/252)  
Local Government Area: Shire of Ashburton  
Colloquial name: Turee Sybcline Drilling

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
24		Mechanical Removal	Hydrogeological Investigations, Mineral Exploration and Associated Activities

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 27 March 2012

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

**Vegetation Description** Beard vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. Two Beard vegetation associations have been mapped within the application area (GIS Database):

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

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

Sixteen vegetation assemblages have been recorded in the application area from the GHD (2009a; 2009b) and Matiske (2011) surveys (Rio Tinto, 2012a).

#### Flowlines

MF (Minor Flowlines) - Low Open Woodland to High Open Shrubland of *Acacia aneura*, *A. pruinocarpa*, *A. pyriformis*, *Senna artemisioides* subsp. *oligophylla*, over Open Shrubland of *S. glutinosa x luerssenii*, *S. stricta*, *Corchorus lasiocarpus* over, Low Open Shrubland of *Ptilotus obovatus*, *Indigofera monophylla*, *Rhynchosia minima* over Open Tussock Grassland of *Aristida inaequiglumis*, *Themeda* sp. Mt Barricade, *Cymbopogon* sp., *Enneapogon caeruleus* with Open Hummock Grassland of *Triodia wiseana* with *Triodia* spp.

LW1 + HG3 (Low Woodland 1, Shrubland, Hummock Grassland 2) - Low Woodland of *Acacia aneura*, *A. pruinocarpa*, *A. citrinoviridis* over Open Shrubland of *Senna stricta*, *Senna artemisioides* subsp. *oligophylla*, *Eremophila forrestii*, over Low Open Shrubland of *Senna* spp., *Sida* spp., *Marieana* spp. over Very Open Hummock Grassland of *Triodia wiseana* with Very Open Tussock Grassland of *Enneapogon caeruleus*, *Paspalidium basicladum*.

LW2 + HG1 (Low Woodland 2, Shrubland, Hummock Grassland 1) - Low Woodland of *Acacia citrinoviridis*, *A. aneura*, *A. hamersleyensis*, over Open Shrubland of *Senna* spp., *Eremophila latrobei*, *Dodonaea pachyneura*, *Corchorus lasiocarpus*, over Low Open Shrubland of *Dipteracanthus australasicus*, *Lepidium pedicellosum*, over Open Hummock Grassland of *Triodia epactia* with Open Tussock Grassland of *Cymbopogon ambiguus*, *Enneapogon caeruleus*, *Aristida* spp.

W (Woodland, Shrubland, Hummock Grassland) - Low Woodland to Low Open Forest of *Eucalyptus victrix*, *Corymbia ferritcola*, *Acacia citrinoviridis*, *A. pruinocarpa*, *A. ayersiana* over Scattered Tall Shrubs of *Rhagodia eremaea*, *Gossypium robinsonii*, over Open Shrubland of *Senna* spp., *Jasminum didymum* subsp. *lineare*, over Low Shrubland of *Dipteracanthus australasicus*, *Diocladanthera forrestii*, *Harniera kempeana*, *Corchorus lasiocarpus*, over Very Open Hummock Grassland of *Triodia epactia*, *T. longiceps*, with Very Open Tussock Grassland of *Cenchrus ciliaris*, *Themeda* sp. Mt Barricade, *Cymbopogon ambiguus*, *Enneapogon caeruleus*.

#### Hills

HG1 (Hummock Grassland 1) - Hummock Grassland of *Triodia epactia* with emergent Scattered Low Trees

(variable) of *Eucalyptus leucophloia*, *Acacia pruinocarpa*, *Grevillea berryana*, *Hakea chordophylla*, *Codonocarpus cotonifolia*, with emergent scattered Tall Shrubs to Shrubs (variable) of *Petalostylis labicheoides*, *Acacia maitlandii*, *A. pyrifolia*, *A. inaequilatera*, *Senna* spp., *Eremophila phyllopoa*, *E. jucunda*, with Low Scattered Shrubs of *Ptilotus calostachyus*, *Goodenia stobbsiana*, *Lepidium pedicellum*, *Solanum lasiophyllum*.

HG2 (Hummock Grassland 2) - Hummock Grassland of *Triodia longiceps*, *T. epactia* with emergent Scattered Low Trees of *Acacia pruinocarpa*, with emergent Scattered Shrubs to Low Shrubs of *Eremophila cuneifolia*, *E. latrobei*, *Senna* spp., *Sida* spp., *Stylobasium spathulatum*, *Triumfetta leptacantha*, *Lepidium pedicellum*.

HG3 (Hummock Grassland 3) - Closed Hummock Grassland to Hummock Grassland of *Triodia wiseana*, with emergent Scattered Low Trees of *Acacia pruinocarpa*, *A. inaequilatera*, with emergent Scattered Shrubs to Low Shrubs of *A. arida*, *A. bivenosa*, *A. synchronicia*, *A. tetragonophylla*, *Senna* spp., *Tribulus suberosus*, *Eremophila cuneifolia*, *E. jucunda*, *E. fraseri*.

HG1 + S1 (Hummock Grassland 1, Shrubland 1) - Open Scrub to High Open Shrubland of *Acacia maitlandii* with scattered *Senna* spp., *Eremophila* spp., *Petalostylis labicheoides*, *Tribulus suberosus*, *Goodenia stobbsiana*, *Ptilotus* spp., with emergent Scattered Low Trees of *Eucalyptus leucophloia*, *E. gamophylla*, *E. kingsmillii*, *Acacia pruinocarpa*, *A. pyrifolia*, over Closed Hummock Grassland to Hummock Grassland of *Triodia epactica* with occasional *Triodia pungens*, with Very Open to Scattered Tussock Grassland of *Amphipogon* spp., *Eriachne* spp.

HG1 + S2 (Hummock Grassland 1, Shrubland 2) - High Shrubland to High Open Shrubland of *Petalostylis labicheoides* with scattered *Senna* spp., *Eremophila* spp., *Acacia maitlandii*, *Tribulus suberosus*, *Goodenia stobbsiana*, *Ptilotus* spp. *Solanum lasiophyllum*, *Corchorus lasiocarpus*, with emergent Scattered Low Trees of *Acacia pruinocarpa*, *A. pyrifolia*, *A. aneura*, over Hummock Grassland to Open Hummock Grassland of *Triodia epactica*.

HG1 + S3 (Hummock Grassland 1, Shrubland 3) - High Shrubland to High Open Shrubland of *Acacia maitlandii*, *Petalostylis labicheoides* with scattered *Senna* spp., *Eremophila* spp., *Tribulus suberosus*, *Goodenia stobbsiana*, *Ptilotus* spp., with emergent Scattered Low Trees of *Eucalyptus leucophloia*, *Corymbia ferritcola*, *A. pyrifolia*, *Hakea chordophylla*, over Closed Hummock Grassland to Hummock Grassland of *Triodia epactica* with occasional *Triodia pungens*, with Very Open to Scattered Tussock Grassland of *Enneapogon caerulescens*.

HG1 + S4 (Hummock Grassland 1, Shrubland 4) - High Shrubland of Mixed *Acacia* spp. (typically: *Acacia pruinocarpa*, *A. pyrifolia*, *A. sibirica*, *A. inaequilatera*, *A. bivenosa*, etc.) over Shrubland to Open Shrubland of *Senna* spp., *Eremophila* spp., *Petalostylis labicheoides* scattered *Goodenia stobbsiana*, *Solanum lasiophyllum*, *Ptilotus* spp., with emergent Scattered Low Trees of *Eucalyptus leucophloia*, over Hummock Grassland of *Triodia epactica* Very Open Tussock Grassland of *Eriachne* spp., *Themeda* sp. Mt Barricade, *Cymbopogon ambiguus*.

HG3 + S4 (Hummock Grassland 2, Shrubland 4) - High Shrubland of Mixed *Acacia* spp. (typically: *Acacia pruinocarpa*, *A. pyrifolia*, *A. bivenosa*, *A. adsurgens*, *A. synchronicia*, etc.) over Shrubland to Open Shrubland of *Senna* spp., *Eremophila* spp., *Petalostylis labicheoides* over Hummock Grassland of *Triodia wiseana*.

HG1 + LW1 (Hummock Grassland 1 + Low Open Woodland 1) - Low Open Forest to Low Woodland of *Acacia aneura* with *A. ayersiana*, *A. hamersleyensis* over High Shrubland of *Acacia tetragonophylla*, *A. synchronicia*, *A. pruinocarpa*, *Psyrax latifolia* over Shrubland to Open Shrubland of *Senna* spp., *Eremophila* spp., over Low Shrubland to Low Open Shrubland of *Senna stricta*, *Maireana melanocoma*, *Enchylaena tomentosa*, *Sclerolaena* spp., over Hummock Grassland to Open Hummock Grassland of *Triodia epactia* with scattered *T. wiseana*, *T. longiceps*, with Open Tussock Grassland of *Eriachne* spp., *Aristida* spp., *Enneapogon* spp.

HG1 + LW2 (Hummock Grassland 1, Low Open Woodland 3) - Low Open Woodland to Very Open Tree Mallee of *Eucalyptus gamophylla*, *E. kingsmillii*, *E. leucophloia*, *E. trivalva* over High Open Shrubland of *Acacia pyrifolia*, *A. tumida*, *A. pruinocarpa*, *A. hamersleyensis* with *Petalostylis labicheoides* over Open Shrubland to Low Open Shrubland of *Eremophila* spp., *Senna glutinosa*, *Psyrax latifolia*, *Tribulus suberosus* over Hummock Grassland of *Triodia epactia* with Scattered Tussock Grasses of *Eriachne* spp., *Cymbopogon ambiguus*.

LW1 + HG1 (Low Woodland 1, Hummock Grassland 1) - Low Open Forest to Low Woodland of *Acacia aneura* with *A. ayersiana*, *A. hamersleyensis* over High Shrubland of *Acacia tetragonophylla*, *A. synchronicia*, *A. pruinocarpa*, *Psyrax latifolia* over Shrubland to Open Shrubland of *Senna* spp., *Eremophila* spp., over Low Shrubland to Low Open Shrubland of *Senna stricta*, *Maireana melanocoma*, *Enchylaena tomentosa*, *Sclerolaena* spp., over Hummock Grassland to Open Hummock Grassland of *Triodia epactia* with scattered *T. wiseana*, *T. longiceps*, with Open Tussock Grassland of *Eriachne* spp., *Aristida* spp., *Enneapogon* spp.

LW1 + HG2 (Low Woodland 1, Hummock Grassland 2) - Low Woodland of *Acacia aneura*, *A. pruinocarpa* over High Open Shrubland of *Acacia tetragonophylla*, *Santalum lanceolatum* over Open Heath to Shrubland of *Senna* spp., *Eremophila* spp., over Low Open Shrubland of *Ptilotus* spp. And mixed chenopods, over Very Open Hummock Grassland of *Triodia longiceps*.

## Plains

HG5 + S4 (Hummock Grassland 5, Shrubland 4) - High Shrubland of *Acacia tetragonophylla* with *A. aneura*, *A. hamersleyensis* over Shrubland of *Ptilotus obovatus*, *Eremophila cuneifolia* with *Senna* spp., *Chenopodium auricomum* over Open Shrubland of *Corchorus lasiocarpus*, *Enchylaena tomentosa*, *Tribulus suberosus*, *Ptilotus* spp. over Hummock Grassland of *Triodia longiceps*, *T. wiseana*.

## Minor Gullies and Creeklines

3a - Low shrubland of *Acacia pyrifolia*, *Petalostylis labicheoides* over *Triodia* species and low shrubs and herbs on minor gullies in undulating hills.

## Low Undulating Hills and Associated Slopes

10b - Hummock grassland of *Triodia wiseana* with patches of *Acacia arida*, *A. pyrifolia*, *A. tetragonophylla* over

*Eremophila cuneifolia* over low herbs and grasses on lower undulating hills.

<b>Clearing Description</b>	<p>Hamersley Iron Pty Ltd (Hamersley Iron) has applied to clear up to 24 hectares of native vegetation within an application area of approximately 1,853 hectares for the purpose of hydrogeological investigations, mineral exploration and associated activities. This includes disturbance for hydrogeological drilling (8 hectares) and disturbance for diamond drilling (16 hectares) (Rio Tinto, 2012b).</p> <p>Vegetation will be cleared by mechanical means, using a raised blade clearing technique where possible (Rio Tinto, 2012b).</p>
<b>Vegetation Condition</b>	<p>Completely degraded: No longer intact; completely / almost completely without native species (Keighery, 1994);</p> <p>To:</p> <p>Pristine: No obvious signs of disturbance (Keighery, 1994).</p>
<b>Comment</b>	<p>The application area is located in the Hamersley subregion of Western Australia and is situated approximately 30 kilometres east of Paraburdo.</p> <p>The vegetation condition is derived from vegetation and flora surveys undertaken by GHD (2009a; 2009b) and Matiske (2011).</p>

### 3. Assessment of application against clearing principles

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

<b>Comments</b>	<p><b>Proposal may be at variance to this Principle</b></p> <p>The application area occurs within the Hamersley (PIL3) Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS Database). This subregion is generally described as Mulga low woodland over bunch grasses on fine textured soils in valley floors, and <i>Eucalyptus leucophloia</i> over <i>Triodia brizoides</i> on skeletal soils of the ranges (CALM, 2002).</p> <p>The vegetation within the application area is broadly mapped as Beard vegetation associations 82 and 567, both of which have approximately 100% of their pre-European vegetation extent remaining in the bioregion (Shepherd, 2009; GIS Database). The vegetation present within the application area is widely represented in the Hamersley sub-region and it is unlikely that the proposed clearing would impact biodiversity values within these vegetation types on a broader scale (Rio Tinto, 2012a).</p> <p>Two surveys (GHD, 2009a; Matiske, 2011) have provided vegetation mapping for the application area, which has produced sixteen different vegetation types (Rio Tinto, 2012a). None of the vegetation types were identified as being restricted to the application area and none are of particular conservation significance (Rio Tinto, 2012a).</p> <p>The study area and surrounds has been the subject of flora and vegetation surveys in 2003, 2008, 2009, and 2011 by Biota, GHD and Matiske. Combined, these surveys covered over 12,000 hectares, including the application area. In July, August and September of 2003 a majority of the application area was surveyed by Biota, primarily for rare or unknown flora species. In June 2008, GHD undertook a Phase One field survey, returning in April 2009 to undertake a Phase Two flora survey over what is referred to as the Turee Syncline study area. In July 2011, Matiske undertook a baseline vegetation and flora survey over a large area which included the north eastern most corner of the application area (Rio Tinto, 2012a; Matiske, 2011; Biota, 2003; GHD, 2009a; GHD, 2009b).</p> <p>The condition ranking of vegetation types was deemed to be 'completely degraded' to 'pristine', with some minor disturbances from access tracks and previous exploration activities and the rest of the vegetation largely intact (Keighery, 1994; Rio Tinto, 2012a).</p> <p>The flora within the application area is considered to be moderately diverse. For example, the flora surveys by GHD (GHD, 2009a; GHD 2009b) recorded a total of 327 flora taxa, compared to Karijini National Park (to the east of the survey area) which has recorded in excess of 500 taxa (Rio Tinto, 2012a).</p> <p>No Threatened Flora have been recorded in the application area and three Priority Flora species have been recorded in the application area; <i>Eremophila coacta</i> (Priority 3), <i>Sida</i> sp. Barlee Range (Priority 3) and <i>Ptilotus mollis</i> (Priority 4) (Rio Tinto 2012a; GIS Database). All species were recorded numerous times within the application area but were also recorded numerous times outside of the application area (Rio Tinto, 2012a). Similar habitat for these species is considered to be fairly common along the Hamersley Range (Rio Tinto, 2012a).</p> <p>GHD (2009a) recorded ten weed species, but considered that the survey area was relatively weed free. The weed species that have been recorded are Bipinnate Beggartick (<i>Bidens bipinnata</i>), Buffel Grass (<i>Cenchrus ciliaris</i>), Spiked Malvastrum (<i>Malvastrum americanum</i>), Whorled Pigeon Grass (<i>Setaria verticillata</i>), Indian weed (<i>Sigesbeckia orientalis</i>), <i>Cucumis melo</i> subsp. <i>agrestis</i>, Green Amaranth (<i>Amaranthus viridis</i>), Kapok Bush (<i>Aerva javanica</i>), Khaki Weed (<i>Alternanthera pungens</i>), and Ruby Dock (<i>Rumex vesicarius</i>) (GHD, 2009a). Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed</p>
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species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

There are no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) occurring within the application area. The southern edge of the buffer zone for the *Themeda* grasslands TEC is approximately 70 kilometres north north-west of the application area.

The broad study areas described in Matiske (2011), Biota (2003), GHD (2009a) and GHD (2009b) do comprise a relatively high level of biological diversity. However, the application area is much smaller than these study areas (1,853 hectares) and the area of proposed clearing smaller still (24 hectares). Populations of Priority Flora species will be avoided by Hamersley Iron where-ever possible (Rio Tinto, 2012a). Similarly, specialised fauna habitat will be avoided by Hamersley Iron where ever possible.

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

**Methodology** Biota (2003)  
CALM (2002)  
GHD (2009a)  
GHD (2009b)  
Keighery (1994)  
Matiske (2011)  
Rio Tinto (2012a)  
Shepherd (2009)  
GIS Database:  
- Threatened and Priority Flora  
- IBRA WA (Regions - Sub Regions)  
- Pre-European Vegetation  
- Threatened Ecological Sites Buffered

**(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.**

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

The study area and surrounds has been the subject of a Phase One and Phase Two vertebrate fauna study, both undertaken by GHD in June 2008 and October 2008 respectively (GHD, 2009a). These surveys covered 3,000 hectares, including the majority of the application area.

Based on these surveys, the application area includes four main habitat types:

- Ridges and scree slopes;
- Breakaways, cliff faces, gullies and gorges;
- Mulga woodland; and
- Drainage lines.

The greatest number of species was associated with the ridges and scree slopes and drainage lines habitats (GHD, 2009a). The breakaway, cliff faces, gullies and gorges habitat is likely to provide refugia for a number of native species. Given the scale and nature of the proposed activities, it is not anticipated that large amounts of this habitat will be disturbed. These habitat types are considered to be well represented in the nearby Karijini National Park (Rio Tinto, 2012a).

Thirteen species of conservation significance were identified during database searches as potentially occurring in the application area. Seven were recorded by the fauna surveys, in or adjacent to the application area. This includes three which have been identified as vulnerable to land clearing, because of their lack of mobility – Pilbara Leaf-nosed bat (*Rhinonicterus aurantia* – Schedule 1), Olive Python (*Liasis olivaceus barroni* – Schedule 1), and Western Pebble Mound Mouse (*Psuedomys chapmani* – Priority 4). The application area also contains suitable habitat for the Northern Quoll (*Dasyurus hallucatus* – Schedule 1). Potential roosting sites for the Pilbara Leaf-nosed Bat were identified at Turee Syncline, however, they have since been identified as being too shallow to support roost sites (Rio Tinto, 2012a).

Given that the proposed clearing is spread over a large area (over 1,800 hectares), it is not expected to have a significant impact on habitat for these conservation significant fauna.

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

**Methodology** GHD (2009a)  
Rio Tinto (2012a)

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

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

According to available databases, there are no records of Threatened Flora within the application area (GIS

Database). No species of Threatened Flora have been recorded from any of the flora surveys conducted over the application area (Rio Tinto, 2012a).

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

**Methodology** Rio Tinto (2012a)  
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**

According to available databases, there are no records of any Threatened Ecological Communities (TECs) within the application area (GIS Database). None of the vegetation communities identified during the vegetation surveys conducted over the application area was identified as being a TEC (Rio Tinto, 2012a).

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

**Methodology** Rio Tinto (2012a)  
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 falls within the Pilbara Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.9% of the pre-European vegetation remains (see table) (GIS Database, Shepherd, 2009).

The vegetation of the application area has been mapped as the following Beard vegetation associations (GIS Database):

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

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

According to Shepherd (2009) approximately 100% of these Beard vegetation associations remains at both a state and bioregional level. Therefore the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,193	17,785,000	~99.9	Least Concern	6.3
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	2,563,583	2,563,583	~100	Least Concern	10.2
567	776,824	776,824	~100	Least Concern	22.4

\* 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 at variance to this Principle**

There are numerous minor ephemeral watercourses within the application area (GIS Database). The vegetation surveys of the application area recorded five vegetation assemblages that were associated with either flowlines or creeklines (Rio Tinto, 2012a). These vegetation assemblages are considered to be common within the local and regional area (Rio Tinto, 2012a). Given that the proposed clearing is 24 hectares within a larger area of 1,853 hectares it is not anticipated that a large amount of these vegetation assemblages will be disturbed.

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

**Methodology** Rio Tinto (2012a)  
GIS Database:  
- Hydrography, linear

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

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

The application area has been mapped as occurring on the Newman, Rocklea, Platform and Marandoo land systems (GIS Database). All of these land systems are generally not prone to erosion (Van Vreeswyk et al., 2004). Areas likely to be more prone to erosion are the areas associated with drainage lines.

At a broad scale the surface soil pH of the application area is 5.5 to 6.5 and there is no known occurrence of acid sulphate soils (CSIRO, 2009). The average annual evaporation rate is over eight times the annual average rainfall so there is a low probability of the proposed clearing causing increased groundwater recharge resulting in rising saline water tables (GIS Database).

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

**Methodology** CSIRO (2009)  
Van Vreeswyk et al. (2004)  
GIS Database:  
- Evaporation isopleths  
- Rainfall, Mean Annual  
- Rangeland Land System Mapping

**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

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

The application area does not lie within any conservation areas or DEC managed lands (GIS Database). The nearest conservation area is Karijini National Park which is located approximately three kilometres east of the application area (GIS Database). The area surrounding Karijini National Park is largely uncleared, so the proposed clearing is not likely to disrupt any ecological linkages to the National Park (GIS Database).

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

**Methodology** GIS Database:  
- DEC Tenure  
- Paraburdoo 50cm Orthomosaic

**(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 application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

There are numerous minor non-perennial watercourses within the application area (GIS Database). The majority of the surface water within the application area is likely to occur as sheet flow following heavy rains. With an annual evaporation rate over eight times the average annual rainfall any surface water is likely to evaporate quickly (GIS Database).

The groundwater within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. It would not be expected that the proposed clearing would cause salinity levels within the application or surrounding area to alter.

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

**Methodology** GIS Database:  
- Evaporation Isopleths  
- Groundwater Salinity, Satewide  
- Hydrography, linear  
- Rainfall, Mean Annual

**(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**  
With an average annual rainfall of 400 millimetres and an average annual evaporation rate of 3,400 millimetres there is likely to be little surface flow during normal seasonal rains (GIS Database). Whilst large rainfall events may result in the flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

**Methodology** GIS Database:  
- Evaporation Isopleths  
- Mean Average Rainfall

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

**Comments**  
There is one native title claim over the area under application (GIS Database). This claim (WC10/16) as been registered with the 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*.

According to available databases, there are numerous registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

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

The clearing permit application was advertised on 13 February 2012 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

**Methodology** GIS Database:  
- Aboriginal Sites of Significance  
- Native Title Claims – Registered with the NNTT

#### **4. References**

- Biota (2003) Turee Creek Rare Flora Surveys. Prepared for Rio Tinto Iron Ore. December 2003.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions.
- CSIRO (2009) Australian Soil Resource Information System. Available online at: [http://www.asris.csiro.au/index\\_ie.html](http://www.asris.csiro.au/index_ie.html)  
Accessed on 22 March 2012.
- 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.
- GHD (2009a) Report for Turee Syncline Project – Vegetation, Flora and Fauna Baseline Surveys. Prepared for Rio Tinto Iron Ore. March 2009.
- GHD (2009b) Report for Turee Syncline – Phase Two Flora Survey. Prepared for Rio Tinto Iron Ore. October 2009.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske (2011) Flora and Vegetation Survey of the Turee Syclyne Area.
- Rio Tinto (2012a) Statement Addressing the 10 Clearing Principles – Geotechnical and Hydrogeological Investigations – Turee Syncline. January 2011. Unpublished. Document number RTIO-HSE-0134276.
- Rio Tinto (2012b) Letter to the Department of Mines and Petroleum – Application for a Clearing Permit (Purpose Permit) – Turee Syncline Geotechnical Investigation Activities – ML 252SA (Sections 12-13). 24 January 2012.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) Technical Bulletin - An Inventory and Condition Survey of the Pilbara Region, Western Australia, No. 92. Department of Agriculture, Government of Western Australia, Perth, Western Australia.

## 5. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>CALM</b>	Department of Conservation and Land Management (now DEC), Western Australia
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DEC), Western Australia
<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia
<b>DoE</b>	Department of Environment (now DEC), Western Australia
<b>DoIR</b>	Department of Industry and Resources (now DMP), Western Australia
<b>DOLA</b>	Department of Land Administration, Western Australia
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environmental Protection Act 1986, Western Australia
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI Act</b>	Rights in Water and Irrigation Act 1914, Western Australia
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia
<b>TEC</b>	Threatened Ecological Community

### Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.



{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

**Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)**

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:  
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or  
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:  
(a) is not critically endangered; and  
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:  
(a) is not critically endangered or endangered; and  
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.