Government of **Western Australia**
Department of **Mines and Petroleum**

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4573/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Robe River Mining Co Pty Ltd**

1.3. Property details

Property: *Iron Ore (Robe River) Agreement Act 1964*, Special Lease for Mining Operations 3116/4621 (Document I 123393 L) (Lease Extension E 702246), Lot 62 on Deposited Plan 57725.
Iron Ore (Robe River) Agreement Act 1964, Special Lease for Mining Operations 3116/4622 (Document I 123390 L) (Lease Extension E 702246), Lot 63 on Deposited Plan 54397.
Iron Ore (Hamersley Range) Agreement Act 1963, Special Lease for Mining Operations 3116/4984 (Document I 195323 L) (Lease Extension J761009), Lot 32 on Deposited Plan 47815.
Miscellaneous Licence 47/47
Miscellaneous Licence 47/103
Local Government Area: Shire of Ashburton
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
5.5		Mechanical Removal	Geotechnical Investigations

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 26 October 2011

2. Background

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard vegetation associations have been mapped for the whole of Western Australia. Three Beard vegetation associations have been mapped within the application area (GIS Database). **93:** Hummock grasslands, shrub steppe; kanji over soft spinifex; and **152:** Hummock grasslands, grass steppe; soft and hard spinifex. **587:** Mosaic; Hummock grasslands; open low tree-steppe;snappy gum over *Triodia wiseana* / Hummock grasslands, shrub-steppe; Kanji over *Triodia pungens*. Rio Tinto (2011) have summarised the results of two surveys which have been undertaken over the application area. These surveys were conducted by Biota (2008a) and Rio Tinto (2010) and provide vegetation mapping of the application area. A total of eleven vegetation units were identified within the application area. **Plains** ***AbTlTw*** *- Acacia bivenosa* open shrubland over *Triodia longiceps, Triodia wiseana* hummock grassland on calcrete creek terraces. **Minor Flowlines** ***AmTwGw*** *- Acacia maitlandii, Grevillea wickhamii*	Robe River Mining Co Pty Ltd has applied to clear up to 5.5 hectares of native vegetation for the purpose of geotechnical investigations. Geotechnical investigations are required in order to investigate sub surface conditions for the development of borrow pits within the Millstream Chichester National Park. The borrow pits will support the ongoing operation and maintenance of the Cape Lambert to Pannawonica (Deepdale) and Dampier to Tom Price (Mainline) rail lines and potential expansion projects in the area. Nine prospective borrow pit areas have been identified adjacent to the Deepdale rail line. Clearing will be required for access tracks and testpits. Robe River Mining Co Pty Ltd have confirmed that any proposal to develop the borrow pits will be referred to the Office of the Environmental Protection Authority under s.38 of the *Environmental Protection Act 1986*.	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994). To: Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).	The vegetation condition was assessed by botanists from Biota Environmental Sciences (Biota, 2008) and Rio Tinto (2010) and by the Department of Mines and Petroleum during a site inspection conducted on 20 September 2011.

high shrubland over *Triodia wiseana* hummock grassland.
AtrTwCEEt - *Acacia trachycarpa* shrubland over *Triodia wiseana* open hummock grassland over *Cenchrus ciliaris, Eriachne tenuiculmis* open tussock grassland with *Cyperus vaginatus* scattered sedges and *Stemodia grossa* very open herbs.
GwGpAtCpHclrTwTe - *Grevillea wickhamii, Grevillea pyramidalis* scattered tall shrubs over *Acacia trachycarpa, Cajanus pubescens, Hakea chordophylla* open shrubland over *Indigofera rugosa* low shrubs over *Triodia wiseana, Triodia epactia* closed hummock grassland.

MgTlCEEaCv - *Melaleuca glomerata* shrubland over *Triodia longiceps* scattered hummock grasses over *Cenchrus ciliaris, Eulalia aurea* tussock grassland and *Cyperus vaginatus* very open sedges.

Hillslopes

CHAiTw - *Corymbia hamersleyana* scattered low trees *Acacia inaequilatera* high open shrubland over *Triodia wiseana* hummock grassland.
ChApyAbTw - *Corymbia hamersleyana* scattered low trees over *Hakea chordophylla* scattered tall shrubs over *Corchorus tectus, Acacia pyrifolia, Acacia bivenosa* scattered shrubs over *Triodia wiseana* hummock grassland.

Hillslopes and stony plains

ChApyAbTwTe - *Corymbia hamersleyana* scattered low trees over *Acacia pyrifolia* scattered tall shrubs over *A. bivenosa* open shrubland over *Triodia wiseana, T. epactia* hummock grassland.

Coolabah-type creeks

EvApyTwTeCE - *Eucalyptus victrix* scattered low trees over *Acacia pyrifolia* tall open scrub to tall open shrubland over *Triodia wiseana, T. epactia* hummock grassland and *Cenchrus ciliaris, C. setiger* open tussock grassland.

EvAtrTeCEc - *Eucalyptus victrix* scattered low trees over *Acacia pyrifolia* tall open scrub to tall open shrubland over *Triodia wiseana, T. epactia* hummock grassland and *Cenchrus ciliaris, C. setiger* open tussock grassland.

EvMg - *Eucalyptus victrix* low open woodland over *Melaleuca glomerata* tall shrubland.

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 occurs within the Chichester subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by plains supporting a shrub steppe of *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges (CALM, 2002).

The vegetation within the application area is broadly mapped as Beard vegetation associations 93, 152 and 587, which have approximately 100% of their pre-European extent remaining (Shepherd, 2009; GIS Database). Two surveys have been conducted by Biota (2008a) and Rio Tinto (2010) and provide vegetation mapping of the application area. A total of eleven vegetation units were identified within the application area. Of these the riparian vegetation of the Harding River recorded by Biota (2008a) and the vegetation unit MgTlCEEaCv recorded by Rio Tinto (2010) are considered to have elevated conservation significance. The riparian vegetation of the Harding River includes the vegetation units EvMg, EvApyTwTeCE and EvAtrTeCEc. The remaining vegetation types present within the application area are widely distributed within the Chichester subregion (Biota, 2008a).

The application area is located within the Millstream Chichester National Park and as such all the vegetation units recorded contribute toward the environmental values of the A Class Reserve. Most vegetation types, however, are widely represented within the Chichester sub-region, and Rio Tinto (2011) have identified that the

biodiversity of the landforms and habitats within the application area are considered to be within the expected range for a study area of this size in the locality and well represented within the remainder of the National Park.

No Declared Rare Flora, Priority Flora, Threatened Ecological Communities or Priority Ecological Communities were recorded within the application area, however, the floodplain habitat of the application area is likely to provide suitable habitat for the Priority 3 species *Acacia glaucocaesia* (Biota, 2008a; Rio Tinto 2010; GIS Database). Biota (2008a) have identified that the application area may also have potential to provide habitat for other Priority Flora species.

A fauna survey was undertaken by Biota (2008b) for a rail duplication project from Cape Lambert to Emu Siding and this survey covers a large portion of the application area. Observations of fauna made during a 2010 survey conducted by Rio Tinto provide information for the remainder of the application area. Biota (2008b) have identified that the fauna assemblages recorded do not appear to indicate a particularly diverse fauna assemblage (Biota, 2008b). Rio Tinto (2010) identified that the fauna habitats within the study area are common and widespread locally as well as sub regionally.

The riparian vegetation associated with the Harding River system was considered to hold high conservation significance as it supports flora species which can be restricted to such habitat, and is generally more species-rich than surrounding habitat (particularly for ephemeral herbs and tussock grasses) (Rio Tinto, 2011). This habitat also supports fauna which may be restricted to these areas (such as passerines, dragon flies and fish) (Biota, 2008b). It is therefore considered important for diversity at a local scale (Rio Tinto, 2011). The vegetation unit, MgTlCEEaCv, which is within a permanent / semi-permanent soak, was considered to hold high conservation significance due to its position on the channels and tributaries of the Harding River (Rio Tinto, 2010).

Seventeen introduced flora species were recorded during the flora and vegetation survey conducted by Biota (Biota, 2008a). Buffel Grass (*Cenchrus ciliaris*) was especially prevalent in areas close to the existing rail line (Biota, 2008a). Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed 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.

The application area is located within the Millstream Chichester National Park and contains two vegetation communities which are considered to hold relatively high conservation value. The application area may also have potential to support habitat for Priority Flora species and as such the area proposed for clearing may represent an area of high biological diversity.

Based on the above, the proposed clearing may be at variance to this Principle. However, the proposed geotechnical investigations are low-impact, and would not be expected to substantially impact upon the Harding River systems identified. The Harding River system represents approximately only 1.7% of the application area. In addition, potential impacts to Priority Flora and the vegetation community MgTlCEEaCv, which contains a permanent / semi-permanent soak, may be minimised by the implementation of a flora management condition and a condition which restricts access to the vegetation unit MgTlCEEaCv.

Methodology

Biota (2008a)
Biota (2008b)
CALM (2002)
Rio Tinto (2010)
Rio Tinto (2011)
Shepherd (2009)
GIS Database:
- Cooya Pooya 1.4 m Orthomosaic - Landgate 1998
- Declared Rare and Priority Flora List
- IBRA WA (Regions - Subregions)
- 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

A fauna survey was undertaken by Biota (2008b) for a rail duplication project from Cape Lambert to Emu Siding and this survey covers a large portion of the application area. Observations of fauna made during a 2010 survey conducted by Rio Tinto provide information for the remainder of the application area. Four main habitat types were identified within the application area:

- Major drainage line with *Eucalyptus* sp. over Buffel grass (*Cenchrus ciliaris*);

- Small drainage lines with *Acacia* sp. over *Triodia* sp.;

- Rocky hill slopes with *Triodia* sp., sometimes with scattered *Acacia* sp.; and

- Scattered to open *Acacia* sp. shrublands over *Triodia* sp. on clayey loam;

The application area is located within the Millstream Chichester National Park and as such all the habitat types recorded contribute toward the environmental values of the A Class Reserve, however, Rio Tinto (2010) identified that the fauna habitats within the study area are common and widespread locally as well as sub regionally. Biota (2008b) have identified that the fauna assemblages recorded do not appear to indicate a particularly diverse fauna assemblage (Biota, 2008b).

The riparian vegetation associated with the Harding River system was considered to hold high conservation significance and this habitat also supports fauna which may be restricted to these areas (such as passerines, dragon flies and fish) (Biota, 2008b). The vegetation unit, MgTlCEEaCv, which is within a permanent / semi-permanent soak, was considered to hold high conservation significance due to its position on the channels and tributaries of the Harding River (Rio Tinto, 2010).

The proposed geotechnical investigations are low-impact, and would not be expected to substantially impact upon the Harding River systems identified. The Harding River system represents approximately only 1.7% of the application area. In addition, potential impacts to the vegetation community MgTlCEEaCv, which contains a permanent / semi-permanent soak, may be minimised by the implementation of a condition which restricts access to the vegetation unit MgTlCEEaCv.

An assessment of results from database searches and the Biota (2008b) project area by Rio Tinto (2011) yielded a number of conservation significant fauna potentially occurring within the application area. However, the assessment found that while some conservation significant fauna species may temporarily utilise the habitats within the study area, the proposed disturbance to foraging habitat is unlikely to impact the conservation status of any fauna taxa (Rio Tinto, 2011). The vegetation within the application area may be utilised by a variety of fauna but the extent of similar habitat outside the application area and the low impact nature of the activities to be conducted means that the areas to be impacted are unlikely to provide significant habitat for fauna.

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

Methodology Biota (2008b)
Rio Tinto (2010)
Rio Tinto (2011)
GIS Database:
- Cooya Pooya 1.4 m Orthomosaic - Landgate 1998

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

Comments **Proposal is not likely to be at variance to this Principle**
There are no known records of Declared Rare Flora (DRF) within the application area (GIS Database).

A flora and vegetation survey of the application area did not identify any DRF species within the application area (Biota, 2008a; Rio Tinto, 2010).

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

Methodology Biota (2008a)
Rio Tinto (2010)
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 known Threatened Ecological Communities (TECs) within the application area and there are no TECs which occur within the Chichester subregion (GIS Database).

A flora and vegetation survey of the application area did not identify any TECs within the application area (Biota, 2008a; Rio Tinto, 2010).

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

Methodology Biota (2008a)
Rio Tinto (2010)
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 clearing application area falls within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 99.9% of the pre-European vegetation remains (see table) (Shepherd, 2009; GIS Database).

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

93: Hummock grasslands, shrub steppe; kanji over soft spinifex;
152: Hummock grasslands, grass steppe; soft and hard spinifex; and
587: Mosaic; Hummock grasslands; open low tree-steppe; snappy gum over *Triodia wiseana* / Hummock grasslands, shrub-steppe; Kanji over *Triodia pungens*.

According to Shepherd (2009) approximately 100% of these Beard vegetation associations remains at the state and bioregional levels.

The vegetation under application is not a remnant of vegetation in 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	17,785,001	~99.9	Least Concern	6.3
Beard Veg Assoc. – State					
93	3,044,308	3,044,249	~100	Least Concern	0.4
152	306,407	306,407	~100	Least Concern	2.2
587	585,715	585,715	~100	Least Concern	21
Beard Veg Assoc. – Bioregion					
93	3,042,113	3,042,064	~100	Least Concern	0.4
152	177,946	177,946	~100	Least Concern	3.8
587	585,715	585,715	~100	Least Concern	21

* 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 - 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

The application area transects the Harding River system, which comprises the main drainage feature in the locality (Rio Tinto, 2011; GIS Database). There are numerous minor ephemeral watercourses located within the area under application (GIS Database).

The riparian vegetation associated with the Harding River system is considered to hold high conservation significance as it supports flora species which can be restricted to such habitat, and is generally more species-rich than surrounding habitat (particularly for ephemeral herbs and tussock grasses) (Rio Tinto, 2011). This habitat also supports fauna which may be restricted to these areas (such as passerines, dragon flies and fish) (Biota, 2008b). The Harding River is important for biodiversity at a local scale (Rio Tinto, 2011).

In addition the vegetation unit, MgTICEEaCv, is located within a permanent / semi-permanent soak. This vegetation unit is considered to hold high conservation significance due to its position on the channels and tributaries of the Harding River (Rio Tinto, 2010).

While a small amount of clearing (5.5 hectares) will take place as a result of the geotechnical investigations, the proposed activities are low-impact in nature, and would not be expected to substantially impact the Harding River system. The Harding River system represents approximately only 1.7% of the application area. In addition, potential impacts to the vegetation community MgTICEEaCv, which contains a permanent / semi-permanent soak, may be minimised by the implementation of a condition which restricts access to this vegetation unit.

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

Methodology

Biota (2008b)
Rio Tinto (2010)
Rio Tinto (2011)
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

According to available datasets the application area is located within the Capricorn, Rocklea and River land systems (GIS Database).

The Capricorn land system is characterised by hills and ridges of sandstone and dolomite supporting shrubby hard and soft spinifex grasslands. The stony surfaces of the landforms in this land system provide resistance to erosion (Van Vreeswyk et al., 2004).

The Rocklea land system is characterised by basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands. This system has a very low erosion hazard (Van Vreeswyk et al., 2004).

The River land system consists of active flood plains, major rivers and banks supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands. The system is largely stabilised by buffel and spinifex and accelerated erosion is uncommon. However, susceptibility to erosion is high or very high if vegetative cover is removed (Van Vreeswyk et al., 2004).

The River land system is associated with the Harding River system which runs through the application area. While a small amount of clearing (5.5 hectares) will take place as a result of the geotechnical investigations, the proposed activities are low-impact in nature, and would not be expected to substantially impact the Harding River system. The Harding River system represents approximately only 1.7% of the application area.

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

Methodology

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

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

Comments

Proposal is at variance to this Principle

The application area is located within the Department of Environment and Conservation (DEC) managed Millstream Chichester National Park (GIS Database). The application area is also within the Register of National Estate site 'Chichester Range National Park (1977 Boundary)' (GIS Database) which directly relates to the currently named Millstream Chichester National Park.

Given that the application area is located within the Millstream Chichester National Park all of the vegetation units recorded within the application area contribute toward the environmental values of the A Class Reserve. Most vegetation types, however, are widely represented within the Chichester sub-region, and Rio Tinto (2011) have identified that the biodiversity of the landforms and habitats within the application area are considered to be within the expected range for a study area of this size in the locality and well represented within the remainder of the National Park.

The application areas are located adjacent to the existing infrastructure associated with the Deepdale railway and as such the application areas have already suffered some disturbance. The vegetation condition ranges from ‘degraded’ to ‘very good’ (Keighery, 1994). Seventeen introduced flora species were recorded during the flora and vegetation survey conducted by Biota (Biota, 2008a). Buffel Grass (*Cenchrus ciliaris*) was especially prevalent in areas close to the existing rail line (Biota, 2008a). Care must be taken to ensure that the proposed

clearing activities do not spread or introduce weed species to non-infested areas.

Advice from the Department of Environment and Conservation (DEC) has stated no objection to the proposed clearing on the basis that no Declared Rare Flora (DRF), Priority Flora or conservation significant species are impacted by the proposed geotechnical investigations (DEC, 2011). Advice from DEC also requires that weed management practices are implemented and that cleared areas are rehabilitated once no longer required for the purpose for which they are cleared (DEC, 2011).

Given that the application area is located within the Millstream Chichester National Park there is potential for the proposed activities to negatively impact upon the conservation area. However, while a small amount of clearing (5.5 hectares) will take place as a result of the geotechnical investigations, the proposed activities are low-impact in nature, and would not be expected to substantially impact upon the values of the national park. Potential impacts to the national park as a result of the proposed clearing may be minimised by the implementation of flora management, rehabilitation and weed management conditions.

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

Methodology
Biota (2008a)
DEC (2011)
Keighery (1994)
Rio Tinto (2011)
GIS Database:
- DEC Tenure
- Register of National Estate

(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 located within the Harding Dam Catchment Area, a Public Drinking Water Source Area (PDWSA) (GIS Database). The Harding Dam Catchment Area has been assigned a 'Priority 1' classification however the Department of Water (DoW) has advised that the clearing application is acceptable provided activities are carried out in accordance with DoW's water quality protection guidelines (DOW, 2011).

The application area transects the Harding River system, which comprises the main drainage feature in the locality (Rio Tinto, 2011; GIS Database). There are numerous minor ephemeral watercourses located within the area under application (GIS Database). These minor drainage lines would only hold surface water for short durations following significant rainfall events. Sediment loads are typically high in flowlines in the Pilbara following large rainfall events and any increase to the sediment load caused by the proposed clearing is likely to be negligible.

The Harding River system represents approximately only 1.7% of the application area (GIS Database). The proposed geotechnical investigations are low impact in nature and it is not likely that the clearing of 5.5 hectares of native vegetation will cause any deterioration in the quality of surface or underground water.

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

Methodology
DoW (2011)
Rio Tinto (2011)
GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas (PDWSAs)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments

Proposal is not likely to be at variance to this Principle

The application area is located within the Harding River catchment area of the Port Hedland Coast basin (GIS Database). Given the size of the area to be cleared (5.5 hectares) in relation to the size of the catchment area (155,807 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

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

Methodology
GIS Database:
- Hydrographic Catchments - Catchments

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.

Comments

There is one Native Title Claim (WC99/14) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are four 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 5 September 2011 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received.

Methodology

GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Determined by the Federal Court

4. References

Biota (2008a) A Vegetation and Flora Survey of the Rio Tinto Rail Duplication Project - Cape Lambert to Emu Siding. Report Prepared by Biota Environmental Sciences for Rio Tinto Iron Ore, August 2008.

Biota (2008b) Rio Tinto Rail Duplication Fauna Survey Cape Lambert to Emu Siding. Report Prepared by Biota Environmental Sciences for Rio Tinto Iron Ore, July 2008.

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

DEC (2011) DEC Advice for Clearing Permit Application CPS 4573/1. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP). Department of Environment and Conservation Environmental Management Branch, Western Australia.

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

DoW (2011) Public Drinking Water Source Area (PDWSA) Advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP). Department of Water, Western Australia.

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

Rio Tinto (2010) Botanical Survey of proposed Borrow Pit Areas at Chainage 81.5km and 83km on the Dampier to Mt Tom Price Rail Line. January 2010.

Rio Tinto (2011) Statement Addressing the 10 Clearing Principles. Multiple Borrow Pits. Unpublished Report Prepared by Rio Tinto, August 2011.

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:

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

DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

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

P1 **Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P2 **Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P3 **Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

P4 **Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

R **Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

X **Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

Schedule 1 **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.

Schedule 2 **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.

Schedule 3 **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

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

P1 **Priority One: Taxa with few, poorly known populations on threatened lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P2 **Priority Two: Taxa with few, poorly known populations on conservation lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P3 **Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P4 **Priority Four: Taxa in need of monitoring**: Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

P5 **Priority Five: Taxa in need of monitoring**: Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

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

EX **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

EX(W) **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.