



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4397/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Robe River Ltd

1.3. Property details

Property: Iron Ore (Robe River) Agreement Act 1964, Mineral Lease 248SA (AML70/248)
Local Government Area: Shire of Ashburton
Colloquial name: Jimmawurrada and Mesa H Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 1 September 2011

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. Three Beard vegetation associations are located within the application area (GIS Database):

Beard vegetation association 82: hummock grasslands, low tree steppe; Snappy Gum over *Triodia wiseana*;

Beard vegetation association 603: hummock grasslands, sparse shrub steppe, *Acacia bivenosa* over hard Spinifex; and

Beard vegetation association 609: mosaic: hummock grasslands, open low tree steppe; Bloodwood with sparse Kanji shrubs over soft Spinifex / hummock grasslands, open low tree steppe; Snappy Gum over *Triodia wiseana* on a lateritic crust.

Six flora and vegetation surveys have been conducted over areas that included the application area in 2003, 2006, 2007, 2009 and 2011. These surveys have been reviewed by Rio Tinto (2011) and the sections relevant to the application area have been summarised in a report. Rio Tinto (2011) reports that the following vegetation communities have been recorded within the application area:

CLAYEY PLAINS

CcCAoTwTe/h

Corymbia candida low woodland over *Cassia* aff. *oligophylla* (thinly sericeous) low shrubland over *Triodia wiseana*, *Triodia epactia* open hummock grassland with patches of herbland. This vegetation unit has high conservation significance.

MESA TOPS AND HILLS

AiTWTsr

Acacia inaequilatera scattered tall shrubs over *Triodia wiseana*, *Triodia* sp. Robe River open hummock to hummock grassland. This vegetation unit has high conservation significance and is equivalent to Pilbara PEC 22.

AptAaTw

Acacia ptychophylla, *Acacia ancistrocarpa* x open heath over *Triodia wiseana* hummock grassland.

ChAiAbTw

Corymbia hamersleyana scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Acacia bivenosa* scattered shrubs over *Triodia wiseana* hummock grassland.

EIAtenTwERIm

Eucalyptus leucophloia subsp. *leucophloia* scattered low trees over *Acacia tenuissima* shrubland over *Triodia wiseana* hummock grassland and *Eriachne mucronata* scattered tussock grasses. This vegetation unit has high conservation significance and is equivalent to PEC 22.

MESAS, HILLS AND SLOPES

AbTw

Acacia bivenosa open shrubland to open heath over *Triodia wiseana* hummock grassland.

DRAINAGE**ChAbGpTeCE**

Corymbia hamersleyana low woodland over *Acacia bivenosa*, *Grevillea pyramidalis* high open shrubland over *Triodia epactia* hummock grassland and *Cenchrus* spp. open tussock grassland.

EcEvMgCYPvCEc

Eucalyptus camaldulensis, *Eucalyptus victrix* open forest over *Melaleuca glomerata* tall open scrub over *Cyperus vaginatus* open sedgeland over *Cenchrus ciliaris* open tussock grassland.

MINOR CREEKLINE / FLOWLINES**ChAtuPITwTe**

Corymbia hamersleyana low open woodland over *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* open scrub over *Triodia wiseana*, *Triodia epactia* hummock grassland.

CcTw

Corymbia candida low woodland over *Triodia wiseana* open hummock grassland.

ChAtuTwTe

Corymbia hamersleyana low open woodland over *Acacia tumida* var. *pilbarensis* tall open scrub over *Triodia wiseana*, *Triodia epactia* open hummock grassland.

ChAsppGOGsppPLScTeTw

Corymbia hamersleyana scattered low trees to low open woodland over *Acacia* spp., *Gossypium robinsoni*, *Grevillea* spp., *Petalostylis labicheoides*, *Stylobasium spathulatum* tall shrubland over *Triodia epactia*, *Triodia wiseana* hummock grassland.

MINOR DRAINAGE AREAS ON MESA TOPS AND EDGES**ChAtuTw**

Corymbia hamersleyana scattered low trees over *Acacia tumida* var. *pilbarensis* tall open scrub over *Triodia wiseana* open hummock grassland. This vegetation unit has high conservation significance and is equivalent to Pilbara PEC 22.

PLAINS**AxTw/AxTe**

Mosaic of *Acacia xiphophylla* low woodland to tall shrubland over *Triodia wiseana* open hummock grassland and *Acacia xiphophylla* low woodland to tall shrubland over *Triodia epactia* open hummock grassland. This vegetation unit has high conservation significance.

AiAbTw

Mosaic of *Acacia xiphophylla* low woodland to tall shrubland over *Triodia wiseana* open hummock grassland and *Acacia xiphophylla* low woodland to tall shrubland over *Triodia epactia* open hummock grassland.

PLAINS AND LOW RISES**AxTwTe**

Acacia xiphophylla tall open shrubland over *Triodia wiseana*, *Triodia epactia* very open hummock grassland.

ChAaAiTw/ChAtuPTaTe

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa*, *Acacia inaequilatera* scattered shrubs over *Triodia wiseana* hummock grassland / *Corymbia hamersleyana* scattered low trees over *Acacia tumida* closed heath over *Ptilotus astrolasius* low shrubland over *Triodia epactia* hummock grassland.

ChAaTw

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa* open shrubland to open heath over *Triodia wiseana* hummock grassland.

ChAaTwTe

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa* open shrubland to open heath over *Triodia wiseana*, *Triodia epactia* hummock grassland.

ChAaTwTe/AsyAscTe

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa* open shrubland to open heath over *Triodia wiseana*, *Triodia epactia* hummock grassland / *Acacia synchronicia*, *Acacia sclerosperma* subsp. *sclerosperma* tall shrubland to tall open scrub over *Cassia oligophylla* x *helmsii* low open shrubland over *Triodia epactia* very open hummock grassland.

ChAiApyTe

Corymbia hamersleyana open woodland over *Acacia inaequilatera*, *Acacia pyrifolia* tall open shrubland over *Triodia epactia* hummock grassland.

ChAiTw

Corymbia hamersleyana scattered low trees over *Acacia inaequilatera* scattered tall shrubs over mixed scattered shrubs over *Triodia wiseana* open hummock grassland.

STONY HILLS AND BREAKAWAYS

EIAiAptTw

Eucalyptus leucophloia scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Acacia ptychophylla* low open shrubland over *Triodia wiseana* hummock grassland.

ERfTw

Eremophila fraseri open shrubland over *Triodia wiseana* hummock grassland.

STONY HILLS AND HIGH PLAINS

AiTWTspr

Acacia inaequilatera scattered shrubs over *Triodia wiseana*, *Triodia* sp. Robe River hummock grassland. This vegetation unit has high conservation significance and is equivalent to Pilbara PEC 22.

ChAbTw

Corymbia hamersleyana scattered low trees over *Acacia bivenosa* scattered shrubs over *Triodia wiseana* hummock grassland or *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* open shrubland to open heath over *Triodia wiseana* hummock grassland.

ChAiTwTspr

Corymbia hamersleyana scattered low trees over *Acacia inaequilatera* open shrubland over *Triodia wiseana*, *Triodia* sp. Robe River hummock grassland. This vegetation unit has high conservation significance and is equivalent to Pilbara PEC 22.

EIAiAbTw

Eucalyptus leucophloia scattered low trees over *Acacia inaequilatera*, *Acacia bivenosa* scattered tall shrubs over *Triodia wiseana* hummock grassland.

STONY PLAINS

AatAbTw

Acacia atkinsiana tall open shrubland over *Acacia bivenosa* open shrubland over *Triodia wiseana* hummock grassland.

AiAaAbTw

Acacia inaequilatera scattered tall shrubs over *Acacia ancistrocarpa*, *Acacia bivenosa* open shrubland to shrubland over *Triodia wiseana* hummock grassland.

CcAaAbAsyTeTw

Corymbia candida scattered low trees over *Acacia ancistrocarpa*, *Acacia bivenosa*, *Acacia synchronicia* open shrubland over *Triodia epactia*, *Triodia wiseana* hummock grassland.

STONY PLAINS, HILLS AND RIDGES

ChAbTwTe

Corymbia hamersleyana low woodland over *Acacia bivenosa* shrubland over *Triodia epactia*, *Triodia wiseana* mid-dense hummock grassland or *Corymbia hamersleyana* scattered low trees to low woodland over *Acacia bivenosa* open shrubland over *Triodia wiseana*, *Triodia epactia* hummock grassland.

VALLEY FLOORS AND LOW PLAINS

AsclAsyTe

Acacia sclerosperma, *Acacia synchronicia* open shrubland over *Triodia epactia* hummock grassland.

AsyTeCEs

Acacia synchronicia tall open shrubland over *Triodia epactia* hummock grassland over *Cenchrus setiger* open tussock grassland.

Clearing Description

Robe River Ltd (2011) proposes to clear up to 196 hectares of native vegetation, within a larger area totalling approximately 2518 hectares. The application area is located approximately 115 kilometres east of Onslow (GIS Database).

The purpose of the proposed clearing is mineral exploration, including access tracks (Robe River Ltd, 2011). Vegetation will be cleared by bulldozer with the blade down, or where practicable with a scrub rake in level terrain (Robe River Ltd, 2011).

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);

to

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

Comment

The vegetation condition rating was derived from a flora and vegetation survey conducted by Biota Environmental Sciences in October 2010.

3. Assessment of application against clearing principles

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

Comments

Proposal is at variance to this Principle

The application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Hamersley subregion is described by CALM (2002) as being rich in *Acacia*, *Triodia*, *Ptilotus* and *Sida* species.

A flora and vegetation survey was conducted by Biota Environmental Sciences over a 250.4 hectare area that included the application area, in October 2010. This survey recorded a total of 206 native flora species from 85 genera and 37 families (Biota Environmental Sciences, 2011). Given the extent and range of habitats within the survey area, Biota Environmental Sciences (2011) reports that the total flora diversity was less than would normally be recorded. Of the families recorded within the survey area, the five most common represented 64.5% of the total native flora species richness which Biota Environmental Sciences (2011) reports as being consistent with other areas of the Pilbara, and reflects the prominence of these genera and species in the Eremaean flora.

The application area crosses the buffer zone for the Priority 3 Pilbara PEC 22 "*Triodia* sp. Robe River assemblages of mesas of the Robe Valley" (GIS Database; Rio Tinto, 2011). The buffer zone for this PEC is approximately 15,394 hectares. DEC (2010) reports that this PEC appears to be geographically restricted to the extreme south western end of the Hamersley Range where it is known from an area extending from the Fortescue River, south east to the Beasley River. The majority of occurrences have been recorded from the Robe River valley, south to Duck Creek, and these occurrences are typically restricted to mesas and cordillo landforms where the plant assemblages are dominated by, or contain *Triodia* sp. Robe River (DEC, 2010). Furthermore, DEC (2010) states that the community is made up of a mosaic of plant assemblages and is not contained in any reserves. Threats to this PEC are from mining and associated infrastructure (DEC, 2010).

The flora and vegetation survey conducted by Biota Environmental Sciences (2011) identified 10 vegetation units as being consistent with Pilbara PEC 22. Rio Tinto (2011) has recorded 5 of these PEC vegetation units as occurring within the application area:

- **AiTWTsr**
Acacia inaequilatera scattered tall shrubs over *Triodia wiseana*, *Triodia* sp. Robe River open hummock to hummock grassland.
- **EIAtenTwERIm**
Eucalyptus leucophloia subsp. *leucophloia* scattered low trees over *Acacia tenuissima* shrubland over *Triodia wiseana* hummock grassland and *Eriachne mucronata* scattered tussock grasses.
- **AiTWTspr**
Acacia inaequilatera scattered shrubs over *Triodia wiseana*, *Triodia* sp. Robe River hummock grassland.
- **ChAiTWtspr**
Corymbia hamersleyana scattered low trees over *Acacia inaequilatera* open shrubland over *Triodia wiseana*, *Triodia* sp. Robe River hummock grassland.
- **ChAtuTw**
Corymbia hamersleyana scattered low trees over *Acacia tumida* var. *pilbarensis* tall open scrub over *Triodia wiseana* open hummock grassland.

Vegetation mapping conducted by Biota Environmental Sciences (2011) shows that the vegetation units AiTWtsr, ChAtuTw and EIAtenTwERIm are not restricted to the application area, and only small areas of these communities occur within the application area. Given this, the proposed clearing of 196 hectares, within approximately 2518 hectares, for the purpose of mineral exploration, is not likely to affect the conservation status of these vegetation communities. The vegetation units AiTWtspr and ChAiTWtspr occur primarily within the application area with 35.1 hectares of AiTWtspr and 839.8 hectares of ChAiTWtspr occurring within the proposed clearing area. Robe River (2011) reports that 0.4 hectares of AiTWtspr and 7.2 hectares of ChAiTWtspr will be impacted by the proposed clearing. Potential impacts to PEC 22 as a result of the proposed clearing, may be minimised by the implementation of a restricted clearing condition.

No Declared Rare Flora has been recorded within the application area, however, two Priority Flora species have been recorded (Rio Tinto, 2011);

- *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) (Priority 3); and
- *Rhynchosia bungarensis* (Priority 4).

These flora species are not restricted to the application area and the majority of those recorded occur outside of the application area. *Rhynchosia bungarensis* occurs throughout the area with numerous populations occurring outside of the application area (Biota Environmental Sciences, 2011). *Triodia* sp. Robe River appears to be fairly locally common and occurs throughout the area, often in populations of over 100 plants (Biota Environmental Sciences, 2011). Given the above, the proposed clearing is unlikely to affect the

conservation status of these Priority Flora species.

Numerous weed species were recorded within the survey area (Biota Environmental Sciences, 2011). The presence of weed species lowers the biodiversity value of the area. It is important 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.

Numerous fauna surveys have been conducted over the Bungaroo mining project area with three that included survey plots within the application area. One of these surveys was conducted by Biota Environmental Sciences and included field based searches in August 2009 and March 2010. This survey recorded a total of 147 vertebrate fauna species, comprising 51 herpetofauna species, 73 bird species and 23 mammal species (including three introduced species) (Biota Environmental Sciences, 2010). Rio Tinto (2011) reports that this survey was conducted across a 2,518 hectare area. Given the size of the fauna survey area, the level of species diversity indicated above does not appear to be exceptionally diverse in comparison to other surveys conducted within the Pilbara region.

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

Methodology Biota Environmental Sciences (2010)
Biota Environmental Sciences (2011)
CALM (2002)
DEC (2010)
Rio Tinto (2011)
Robe River (2011)
GIS Database:
- IBRA WA (Regions - Subregions)
- 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

Seven fauna surveys have been conducted over the Bungaroo mining project area; including three that incorporated survey sites within the bounds of the application area (Rio Tinto, 2011). Four major fauna habitats have been identified within the application area (Rio Tinto, 2011):

- Valley floor plains and clayey plains with *Triodia* hummock grasslands;
- Minor and major drainages with Eucalypt woodlands over hummock grasses;
- Plains and low rises with open Eucalypt woodland and mixed *Acacia* shrubland over hummock grasses; and
- Stony hills with hummock grassland and emergent *Acacia* shrubs and scattered Eucalypt trees.

These habitat types are reported as being widespread throughout the Bungaroo area and the Pilbara region generally (Rio Tinto, 2011). All mineral exploration activities will be conducted on flat terrain (Robe River, 2011). Considering that the habitats present within the application area are widespread throughout the region, it is considered unlikely that the vegetation of the application area would represent significant habitat for any fauna species.

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

Methodology Rio Tinto (2011)
Robe River (2011)

(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

Six flora and vegetation surveys for areas that included the application area, have been conducted by Biota Environmental Sciences since 2003. A review of these surveys has been conducted and the sections that are relevant to the proposed clearing area have been summarised by Rio Tinto (2011).

No Declared Rare Flora species were recorded within the application area during the flora and vegetation surveys (Rio Tinto, 2011).

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

Methodology Rio Tinto (2011)

(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 area applied to clear (GIS Database). The nearest known TEC is located approximately 100 kilometres south-east of the application area (GIS Database).

Rio Tinto (2011) reports that no TECs were identified within the application area during the flora and vegetation surveys.

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

Methodology Rio Tinto (2011)
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 Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2009) reports that approximately 99.9% of the pre-European vegetation still exists within the Pilbara bioregion (see table below). The vegetation within the application area is recorded as the following Beard vegetation associations (Shepherd, 2009):

Beard vegetation association 82: hummock grasslands, low tree steppe; Snappy Gum over *Triodia wiseana*;
Beard vegetation association 603: hummock grasslands, sparse shrub steppe, *Acacia bivenosa* over hard Spinifex; and

Beard vegetation association 609: mosaic: hummock grasslands, open low tree steppe; Bloodwood with sparse Kanji shrubs over soft Spinifex / hummock grasslands, open low tree steppe; Snappy Gum over *Triodia wiseana* on a lateritic crust.

According to Shepherd (2009) approximately 100% of these vegetation associations still remain within the bioregion (see table below).

The vegetation within the application area is not a 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	17,785,001	~99.9	Least Concern	~6.3
Beard vegetation associations - State					
82	2,565,901	2,565,901	~100	Least Concern	~10.2
603	388,455	388,455	~100	Least Concern	~16.1
609	74,186	74,186	~100	Least Concern	
Beard vegetation associations - Bioregion					
82	2,563,583	2,563,583	~100	Least Concern	~10.2
603	388,455	388,455	~100	Least Concern	~16.1
609	74,186	74,186	~100	Least Concern	

* 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)

(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 may be at variance to this Principle

According to available databases there are several minor, ephemeral watercourses that transect the application area (GIS Database). These watercourses are only likely to flow following significant rainfall.

Given that the proposed clearing of 196 hectares is spread across a 2518 hectare area, and is for the purpose of low impact exploration activities, the proposed clearing is unlikely to have a significant impact on native vegetation growing in association with a watercourse.

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

Methodology 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 may be at variance to this Principle

The application area is located within the Boolgeeda, Newman, River and Robe land systems (GIS Database).

The Boolgeeda, Newman and Robe land systems are not considered by Van Vreeswyk et al. (2004) to be susceptible to soil erosion.

The River land system is described by Van Vreeswyk et al. (2004) as consisting of active flood plains and major rivers supporting grassy Eucalypt woodlands, tussock grasslands and soft Spinifex grasslands. Van Vreeswyk et al. (2004) reports that this system's susceptibility to erosion is high or very high if vegetative cover is removed. Potential soil erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

The proposed clearing is not located within any conservation areas (GIS Database). The nearest Department of Environment and Conservation managed land is the Cane River Conservation Park located approximately 45 kilometres south-west of the application area (GIS Database).

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

Methodology GIS Database:
- DEC Tenure

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

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

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

The application area is located in an arid environment. No permanent waterbodies or watercourses occur within the application area, however, there are several minor ephemeral watercourses present (GIS Database). Surface water runoff is only likely to occur during and immediately following significant rainfall events. The removal of 196 hectares across a 2,518 hectare area, and the shallow ground disturbance related to this clearing, is unlikely to cause 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 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

According to available databases there are several minor, ephemeral watercourses within the application area (GIS Database).

Natural flood events occur seasonally in the Pilbara region as a result of cyclonic activity and sporadic thunderstorm activity. The ephemeral watercourses within the application area could experience natural seasonal flooding from the runoff of surface water following significant rainfall events, however, the proposed clearing of 196 hectares, spread across 2,518 hectares, is unlikely to increase the incidence or intensity of flood events.

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

Methodology GIS Database
- Hydrography, linear

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

Comments

There is one Native Title claim (WC99/12) over the area under application (GIS Database). This claim has been registered with the 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*.

According to available databases there are no 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 was advertised by the Department of Mines and Petroleum on 20 June 2011, inviting submissions from the public. No submissions were received.

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

4. References

- Biota Environmental Sciences (2010) Greater Bungaroo Seasonal Fauna Survey. Unpublished report. Biota Environmental Sciences Pty Ltd, Western Australia.
- Biota Environmental Sciences (2011) Baseline Flora and Vegetation Assessment of Robe Valley Mesas (Mesas B, C, D, E, F, H, and I). Unpublished report. Biota Environmental Sciences Pty Ltd, Western Australia.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- DEC (2010) Priority Ecological Communities for Western Australia Version 15. Species and Communities Branch. Department of Environment and Conservation, 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.
- 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 (2011) Statement Addressing the 10 Clearing Principles. Jimmawurrada & Mesa H evaluation drilling. May 2011. Rio Tinto Iron Ore, Western Australia.
- Robe River Ltd (2011) Clearing Permit Application Supporting Documentation. Robe River Ltd, Western Australia.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P. and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia. Department of Agriculture, Western Australia.

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.