



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4722/1
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*, Mineral Lease 248SA (AML 70/248);
General Purpose Lease 47/1235
General Purpose Lease 47/1236
Local Government Area: Shire of East Pilbara
Colloquial name: West Angelas Power Station Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
135		Mechanical Removal	Power Station and Associated Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 16 February 2012

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Beard vegetation associations have been mapped for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area:</p> <p>18: Low woodland; mulga (<i>Acacia aneura</i>); and 82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> (GIS Database).</p> <p>Numerous vegetation and flora surveys have been undertaken in the West Angelas locality that include all or part of the application area. Rio Tinto (2011a, 2011b, 2011c) consolidated the results from surveys conducted by botanists from Rio Tinto (2009, 2011a, 2011c), Biota (2010), Ecologia (2009) and Trudgen (1998).</p> <p>The application area comprised of 32 vegetation units from seven broad vegetation associations, which are described below. Part of the application area was also mapped as 'Disturbed' (Rio Tinto, 2011c).</p> <ul style="list-style-type: none"> - Hill slopes supporting <i>Eucalyptus leucophloia</i> over <i>Acacia</i> spp. high shrubland and <i>Triodia pungens</i> hummock grassland; - Low hills and footslopes supporting <i>Eucalyptus</i> and/or <i>Corymbia</i> low woodland over <i>Acacia</i> spp. tall open shrubland over mixed <i>Senna</i> and <i>Eremophila</i> shrubs and <i>Triodia</i> hummock grassland; - Gullies on the hillslopes supporting <i>Eucalyptus/Corymbia</i> over mixed open tall shrubland with a tussock grassland of <i>Eriachne mucronata</i> and <i>Triodia pungens</i> hummock grassland; 	<p>Robe River Mining Co Pty Ltd has applied to clear up to 135 hectares of native vegetation within an application area totalling approximately 502 hectares for the purpose of a power station and associated infrastructure. Clearing will be for the construction of the West Angelas power station, water pipeline, diesel pipeline, fibre optic cable, transmission line, permanent access roads, access tracks, laydown areas and borrow pits. The new power station is near Rio Tinto Iron Ore's existing West Angelas mine and is needed to meet anticipated increased power demands for the mine expansion.</p> <p>The application area is located approximately 100 kilometres west-north-west of Newman.</p> <p>The vegetation will be cleared using dozers with the blade down. The vegetation will be stockpiled and used in rehabilitation.</p>	<p>Pristine: No obvious signs of disturbance (Keighery, 1994);</p> <p>To:</p> <p>Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).</p>	<p>The vegetation condition was assessed by botanists from Rio Tinto (2009, 2011a, 2011c), Biota (2010), Ecologia (2009) and Trudgen (1998).</p>

- Clay plains supporting mulga (*Acacia aneura*) and/or mixed *Acacia* woodlands to tall shrublands over a variable shrub understorey of *Maireana*, *Rhagodia*, *Senna* and *Eremophila* spp. and *Triodia pungens* very open hummock grassland;

- Cracking clay (gilgai) clay plains supporting forbs and tussock grasses, dominated by *Astrebla* spp.;

- Ephemeral creeks supporting *Eucalyptus xerothematica* scattered low trees over mixed *Acacia* tall shrubland over *Triodia pungens* open hummock grasslands and scattered *Themeda triandra*, *Chrysopogon fallax* tussock grasses; and

- Ephemeral flowlines supporting *Eucalyptus gamophylla* scattered low trees over *Acacia bivenosa* scattered tall shrubs and *Triodia* spp. open hummock grassland.

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 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 *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

The vegetation within the application area is broadly mapped as Beard vegetation associations 18 and 82, both of which have approximately 100% of their pre-European vegetation extent remaining in the bioregion (Shepherd, 2009; GIS Database). The application area comprised of 32 vegetation units from seven broad vegetation associations (Rio Tinto, 2011c). Most of these vegetation units are considered to be well represented within the Hamersley subregion and the floristic composition and structure of these vegetation types is not considered to be geographically unique or restricted (Rio Tinto, 2011c).

The application area is within the buffer of the Priority Ecological Community (PEC) 'West Angelas cracking clay' (GIS Database) and several vegetation units occurring within the gilgai clay habitat of the application area were considered synonymous with this PEC (Rio Tinto, 2011a, 2011b, 2011c). The 'West Angelas cracking clay' PEC supports a high diversity of herbs and grasses on basalt derived cracking clay depressions and flowlines. The PEC occupies a small proportion of the application area (less than 2 hectares) (Rio Tinto, 2011a, 2011b, 2011c) and not all of the PEC within the application area will be directly impacted on (Rio Tinto, 2011a).

Other vegetation types that support a higher level of floristic diversity are the valley floor mulga (*Acacia aneura*) communities on the clay plains landform (Rio Tinto, 2011b, 2011c). These would support an elevated diversity of understorey annual and ephemeral flora species (Rio Tinto, 2011b, 2011c). The communities are, however, well represented in the West Angelas locality and disturbance to these communities is not expected to significantly alter biodiversity values for the area (Rio Tinto, 2011b, 2011c).

One Priority 3 flora species, *Themeda* sp. Hamersley Station, has been recorded at seven locations within the application area (Rio Tinto, 2011a, 2011c). A population of approximately 200 individuals was recorded within the proposed clearing footprint for the power station during a survey conducted in July and October 2011 (Rio Tinto, 2011c). Another location described the *Themeda* sp. Hamersley Station plants as being in low numbers (Ecologia, 2009). The other five locations of plants had population sizes of less than 100 plants (Rio Tinto, 2011a). This species was also recorded outside the application area during the West Angelas vegetation surveys, with several hundred plants recorded adjacent the application area that will not be impacted on (Rio Tinto, 2011a). This species is widespread in the Hamersley subregion with some large population numbers (Rio Tinto, 2011a; Western Australian Herbarium, 2012). This species is not restricted to the application area and the clearing is unlikely to significantly impact the species (Rio Tinto, 2011c).

Scattered weeds were recorded within the application area with the dominant weed species being Bipinnate Beggartick (*Bidens bipinnata*), Buffel Grass (*Cenchrus ciliaris*), Purslane (*Portulaca oleracea*), Spiked Malvastrum (*Malvastrum americanum*) and Whorled Pigeon Grass (*Setaria verticillata*) (Rio Tinto, 2011b, 2011c). 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 broad fauna habitats types identified within the application area are considered to be widespread and

relatively well represented in the Hamersley subregion of the Pilbara bioregion (Rio Tinto, 2011a, 2011b, 2011c). Therefore fauna diversity is likely to be within expected levels for the area.

There are existing disturbances in the application area from previous tracks, powerlines, pipelines and grazing which has adversely affected the vegetation condition in some parts of the application area and left other parts already cleared of native vegetation (Rio Tinto, 2011a, 2011c; GIS Database). The application area is also situated in close proximity to the existing West Angelas mine (Rio Tinto, 2011c).

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

Methodology CALM (2002)
Ecologia (2009)
Rio Tinto (2011a)
Rio Tinto (2011b)
Rio Tinto (2011c)
Shepherd (2009)
Western Australian Herbarium (2012)
GIS Database:
- IBRA WA (Regions - Subregions)
- Governor 50 cm Orthomosaic - Landgate 2004
- 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

No targeted fauna surveys have been conducted over the application area. Desktop searches were conducted and fauna habitat observations of the application area were noted during the field surveys by Rio Tinto (2011a, 2011c) and Ecologia (2009).

The broad fauna habitats within the application area relate to the vegetation and landforms present and are listed below (Rio Tinto, 2011b, 2011c):

- Hill slopes supporting *Eucalyptus leucophloia* over *Acacia* spp. high shrubland and *Triodia pungens* hummock grassland;
- Low hills and footslopes supporting *Eucalyptus* and/or *Corymbia* low woodland over *Acacia* spp. tall open shrubland over mixed *Senna* and *Eremophila* shrubs and *Triodia* hummock grassland;
- Gullies on the hillslopes supporting *Eucalyptus/Corymbia* over mixed open tall shrubland with a tussock grassland of *Eriachne mucronata* and *Triodia pungens* hummock grassland;
- Clay plains supporting mulga (*Acacia aneura*) and/or mixed *Acacia* woodlands to tall shrublands over a variable shrub understorey of *Maireana*, *Rhagodia*, *Senna* and *Eremophila* spp. and *Triodia pungens* very open hummock grassland;
- Cracking clay (gilgai) clay plains supporting forbs and tussock grasses, dominated by *Astrebla* spp.;
- Ephemeral creeks supporting *Eucalyptus xerothermica* scattered low trees over mixed *Acacia* tall shrubland over *Triodia pungens* open hummock grasslands and scattered *Themeda triandra*, *Chrysopogon fallax* tussock grasses, and
- Ephemeral flowlines supporting *Eucalyptus gamophylla* scattered low trees over *Acacia bivenosa* scattered tall shrubs and *Triodia* spp. open hummock grassland.

These broad habitat types are well represented within the locality and Hamersley subregion (Rio Tinto, 2011b, 2011c). No landforms or habitats present within the application area or wider survey areas are considered unique or range restricted (Rio Tinto, 2011c). No significant habitat features such as potential roosting caves, termite mounds, gorges, water holes or major creeklines were identified within the application area (Rio Tinto, 2011a, 2011c; GIS Database).

The Western Pebble-mound Mouse (*Pseudomys chamanî*) (DEC Priority 4) is known from the West Angelas area and some individual mortality may result from the proposed clearing (Rio Tinto, 2011c). This species is widespread within the ranges of the central and southern Pilbara (Van Dyck and Strahan, 2008). Given that similar habitat for the Western Pebble-mound Mouse is available both locally and throughout the Pilbara, the impact on this species is not likely to be significant.

Biota (2010) reported several mygalomorph spiders of taxonomic interest have been collected from groved mulga communities on the clay plains. The clay plains habitat supporting groved and non-groved mulga communities is therefore considered locally significant for supporting possible short-range endemic (SRE) taxa (Biota, 2010). While the impact on mulga communities on clay plains should be minimised, this community type is well represented in the West Angelas locality (Rio Tinto, 2011c).

According to Rio Tinto (2011a, 2011c), the broad fauna habitats available within the application area are not restricted in the local area or at a subregional scale. Therefore it is considered unlikely that the application area represents significant habitat for fauna indigenous to Western Australia.

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

Methodology Biota (2010)
Ecologia (2009)
Rio Tinto (2011a)
Rio Tinto (2011b)
Rio Tinto (2011c)
Van Dyck and Strahan (2008)
GIS Database:
- Hydrography, Linear

(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 known records of Declared Rare Flora (DRF) within the application area (GIS Database). The nearest record of DRF is located approximately 11 kilometres north-east of the application area (GIS Database).

Vegetation and flora surveys in the West Angelas locality that include all or part of the application area are Rio Tinto (2009, 2011a, 2011c), Biota (2010), Ecologia (2009) and Trudgen (1998). No DRF have been recorded in the West Angelas locality during these surveys (Rio Tinto, 2011a, 2011c).

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

Methodology Biota (2010)
Ecologia (2009)
Rio Tinto (2009)
Rio Tinto (2011a)
Rio Tinto (2011c)
Trudgen (1998)
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

A search of available databases revealed there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest recorded TEC is located approximately 100 kilometres east of the application area (GIS Database).

Vegetation and flora surveys in the West Angelas locality that include all or part of the application area are Rio Tinto (2009, 2011a, 2011c), Biota (2010), Ecologia (2009) and Trudgen (1998). No TECs were recorded within the application area (Rio Tinto, 2011a, 2011c).

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

Methodology Biota (2010)
Ecologia (2009)
Rio Tinto (2009)
Rio Tinto (2011a)
Rio Tinto (2011c)
Trudgen (1998)
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 99.89% of the pre-European vegetation remains (see table) (Shepherd, 2009; GIS Database). This gives it a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation of the clearing application area has been mapped as Beard vegetation associations:

18: Low woodland; mulga (*Acacia aneura*); and
82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (Shepherd, 2009; GIS Database).

According to Shepherd (2009), over 99% of both of these vegetation associations remain at a state level and 100% of vegetation remains at a bioregional level (see table). These vegetation associations would be given a conservation status of 'Least Concern' at both a state and bioregional level (Department of Natural Resources and Environment, 2002).

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	~99.89	Least Concern	6.32
Beard Veg Assoc. – State					
18	19,892,305	19,890,275	~99.99	Least Concern	2.13
82	2,565,901	2,565,901	~100	Least Concern	10.24
Beard Veg Assoc. – Bioregion					
18	676,557	676,557	~100	Least Concern	16.80
82	2,563,583	2,563,583	~100	Least Concern	10.25

* 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

There are no permanent watercourses or wetlands within the application area (Rio Tinto, 2011b, 2011c; GIS Database). However, there are a multitude of minor non-perennial watercourses that cross through the application area (GIS Database).

Rio Tinto (2011c) described seven broad vegetation associations within the application area and two of these are associated with minor watercourses:

- Ephemeral creeks supporting *Eucalyptus xerothermica* scattered low trees over mixed *Acacia* tall shrubland over *Triodia pungens* open hummock grasslands and scattered *Themeda triandra*, *Chrysopogon fallax* tussock grasses, and
- Ephemeral flowlines supporting *Eucalyptus gamophylla* scattered low trees over *Acacia bivenosa* scattered tall shrubs and *Triodia* spp. open hummock grassland.

Based on the above, the proposed clearing is at variance to this Principle. However, vegetation associated with minor drainage lines is widespread in the Pilbara region and the ephemeral watercourses within the application area are minor and not of regional significance.

Methodology Rio Tinto (2011b)
 Rio Tinto (2011c)
 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 intersects the Boolgeeda, Newman, Platform and Rocklea Land Systems (GIS Database).

The Boolgeeda Land System is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands (Van Vreeswyk et al., 2004). The vegetation is generally not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Newman Land System is characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). Each of the landforms in the land system have a mantle of abundant pebbles of ironstone and other rocks, which translates to a low soil erosion risk (Van Vreeswyk et al., 2004).

The Platform Land System is characterised by dissected slopes and raised plains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). The land forms in this land system generally have surface mantles of very abundant pebbles and cobbles and the system is not susceptible 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 (Van Vreeswyk et al., 2004). Van Vreeswyk et al. (2004) report that this system has a very low erosion risk.

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 not likely to be at variance to this Principle

The proposed clearing is not located within a conservation reserve (GIS Database). The nearest conservation area is Karijini National Park, which is located approximately 13 kilometres west of the application area (GIS Database). A large proportion of the vegetation in the Pilbara bioregion remains uncleared, approximately 99.89% (Shepherd, 2009), and in the local area there is still a large proportion of the vegetation remaining to provide a buffer for the national park (GIS Database).

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

Methodology Shepherd (2009)
GIS Database:
- DEC Tenure
- Governor 50 cm Orthomosaic - Landgate 2004
- 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

There are no permanent watercourses or wetlands within the application area (GIS Database). There are several minor ephemeral drainage lines within the application area that would only flow following substantial rainfall events (Rio Tinto, 2011c; GIS Database). The rocky-sloping topography of much of the upper catchments in the Pilbara often produces considerable runoff following the erratic rainfall events, which causes high sedimentation and turbidity in ephemeral watercourses during the flows (Van Vreeswyk et al., 2004). The proposed clearing is unlikely to significantly increase the sediment load of the surface water compared to the surrounding areas and affect the surface or ground water in the area (Rio Tinto, 2011c).

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Newman Water Reserve, which is approximately 74 kilometres to the east (GIS Database). The proposed clearing is unlikely to affect the water quality of the water reserve due to the large distance between it and the application area.

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

Methodology Rio Tinto (2011c)
Van Vreeswyk et al. (2004)
GIS Database:
- Geodata, Lakes
- Hydrography, Linear

(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

Local flooding occurs seasonally in the Pilbara region as a result of cyclonic activity and sporadic thunderstorm activity. There are no moderate or major watercourses likely to be impacted by the proposed clearing, and there are no expected impacts on localised flooding (Rio Tinto, 2011c).

The application area is located within the Ashburton River catchment area (GIS Database). Given the size of the area to be cleared (135 hectares) in relation to the size of the catchment area (7,877,743 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a catchment scale.

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

Methodology Rio Tinto (2011c)
GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

The clearing permit application was advertised on 5 December 2011 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received in relation to the cumulative impacts of clearing in the Shire of East Pilbara. Cumulative impacts have been taken into account under Principle (e).

There are two Native Title Claims (WC10/11 and WC10/16) over the area under application (GIS Database). These claims have 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 several registered Aboriginal Sites of Significance in the vicinity of 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 'East Pilbara Power Station and Gas Lateral' proposal, that relates to the proposed clearing, was referred to the Environmental Protection Authority (EPA) on 1 October 2010. The EPA made a determination not to subject the proposal to a formal environmental impact assessment process, 'Not Assessed – Public Advice Given'.

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

4. References

- Biota (2010) A Flora and Vegetation Survey of the Proposed West Angelas Gas-Fired Power Station and Pipeline Corridor. Unpublished Report Prepared by Biota Environmental Sciences for Rio Tinto Iron Ore Pty Ltd, September 2010.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL3 - Hamersley Subregion). Department of Conservation and Land Management, 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.
- Ecologia (2009) West Angelas Multiple Areas Flora and Vegetation Survey and Desktop Fauna Assessment. Report Prepared by Ecologia Environment for Rio Tinto, January 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.
- Rio Tinto (2009) Flora and Vegetation Assessment of the Proposed West Angelas Discharge Creekline Corridor. Report Prepared by Rio Tinto, November 2009.
- Rio Tinto (2011a) Flora and Vegetation Assessment of the West Angelas Water Pipeline Study Area. Unpublished Report Prepared by Rio Tinto, December 2011.
- Rio Tinto (2011b) Statement Addressing the 10 Clearing Principles - Diesel Pipeline, 220 kV Transmission Line, Fibre Optic Cable and Permanent Access Road for the West Angelas Power Station. Unpublished Report Prepared by Rio Tinto, November 2011.

- Rio Tinto (2011c) Statement Addressing the 10 Clearing Principles - West Angelas Power Station and Proposed Borrow Pits. Unpublished Report Prepared by Rio Tinto, November 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.
- Trudgen, M.E. (1998) Flora and Vegetation Surveys of Orebody A and Orebody B in the West Angelas Hill Area, An Area Surrounding Them, and of Rail Route Options Considered to Link Them to the Existing Robe River Iron Associates Rail Line. Unpublished Report Prepared for Robe River Iron Associates.
- Van Dyck, S. and Strahan, R. (2008) The Mammals of Australia, Third Edition. Reed New Holland, Sydney.
- 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.
- Western Australian Herbarium (2012) FloraBase - The Western Australia Flora. Department of Environment and Conservation. URL: <http://florabase.dec.wa.gov.au> (Accessed 13/2/2012).

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.