



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3584/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Jabiru Metals Limited**

1.3. Property details

Property: Mining Lease 37/1132
Mining Lease 37/1153
Mining Lease 37/1290

Local Government Area: Shire of Leonora

Colloquial name: Bentley Mine Project

1.4. Application

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

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 at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Two Beard Vegetation Associations are located within the proposed clearing area (GIS Database):</p> <p>- Beard Vegetation Association 18: Shrublands; <i>Acacia rostellifera</i> thicket; and</p> <p>- Beard Vegetation Association 28: Open low woodland; mulga.</p> <p>A flora and vegetation survey of the application area was undertaken by Outback Ecology (2009), who have stated that the application area was dominated by one vegetation association:</p> <p>- Low (Open) Woodland of <i>Acacia aneura</i> over Open Shrubland of <i>Acacia</i> and <i>Eremophila</i> spp. Over Low Open Shrubland of <i>Eremophila</i> spp.</p>	<p>Jabiru Metals have applied to clear 77.1 hectares for the purpose of constructing the underground Bentley mine. The Bentley mine lies four kilometres south of the currently operating Jabiru Metals Jaguar mine, and will be operated as a satellite operation to that mine (Jabiru Metals, 2010). Clearing will be required for the following infrastructure:</p> <ul style="list-style-type: none"> • The box cut and portal to the underground operations; • Backfill plant/vent shaft; • ROM pad and workshop; • Magazine and emulsion storage area; • Waste dumps; • Turkeys nest; • Abandonment bund; • Service corridor; • Site office and lay down areas; • Temporary power station; • Haul roads, pipelines and infrastructure routes; and • Topsoil stockpiles. 	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994)</p>	<p>The application area is located approximately 60 kilometres north of Leonora in the north-eastern Goldfields on Mining Leases 37/1132, 37/1153 and 37/1290.</p> <p>Disturbance from previous exploration activities is evident across much of the site in the form of tracks and drill lines (Outback Ecology, 2009). Heavy grazing, predominantly from goats and rabbits has reduced understory layers, leading to a loss of diversity of flora species (Outback Ecology, 2009).</p>

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 not likely to be at variance to this Principle

The application area is located within the East Murchison subregion of the Murchison Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The region is characterised by extensive areas of elevated red desert sandplains, salt lake systems associated with the occluded paleodrainage systems, broad plains of red-brown soils and breakaway complexes (CALM, 2002). The vegetation of the subregion is dominated by Mulga Woodlands often rich in ephemerals; hummock grasslands, saltbush shrublands and Halosarcia shrublands. CALM (2002) reports that most species are wide ranging and usually occur in at least one, and often several, adjoining subregions.

A flora and vegetation survey of the application area was undertaken by Outback Ecology in January 2009. As a result of the flora and vegetation survey, there were 112 taxa from 30 families and 50 genera recorded across the application area (Outback Ecology, 2009). Dominant families were Chenopodiaceae (17 taxa), Myoporaceae (13 taxa), Asteraceae (12 taxa), Malvaceae and Mimosaceae (8 taxa). The vegetation and floristic composition was comparable to other surveys in the local region (Outback Ecology, 2009).

During the flora and vegetation survey there were three introduced species recorded, which were; *Anagallis arvensis* var. *Caerulea* ('Blue Pimpernel'), *Citrullus lanatus* ('Afghan or Pie Melon') and *Cucumis myriocarpus* ('Paddy Melon') (Outback Ecology, 2009). The proposed vegetation clearing has the potential to introduce weed species into the local area should adequate hygiene practices not be put in place. Weeds can affect biodiversity in a number of ways, including out competing native species for resources and increasing the fire risk. Standard weed management protocols can manage the risks posed by the introduction and spread of weeds.

A fauna habitat assessment of the application area was undertaken by Ecotec in September 2009. During the survey there were no conservation significant species recorded (Ecotec, 2009). There were two fauna habitats recorded within the application area, these were: mulga woodland/shrubland and drainage lines (Ecotec, 2009). The majority of the application area is composed of the mulga woodland/shrubland habitat which was found to be of low habitat value because of the lack of understorey flora species (Ecotec, 2009).

The proposed haul road and service corridor intersect some small areas of the drainage line habitat (GIS Database). This habitat was found to be significant because of the presence of large trees and dense vegetation likely to provide nesting sites for a variety of bird species, and food refuge and water for many animals (Ecotec, 2009). These areas have already been subject to disturbance and minimal clearing will be required for widening of the area into a haul road (Jabiru Metals, 2010). Ecotec (2009) have stated that the fauna habitats present within the application area are typical of the northern Goldfields.

The application area has been degraded from previous exploration activities including tracks and drill lines (Outback Ecology, 2009). The application area is also located within the Tarmoola Pastoral Lease (GIS Database), and has been subject to grazing by goats and rabbits which have reduced the understorey and shrub layers, leading to a dominance of *Eremophila margarethae* within the understorey (Outback Ecology, 2009). On this basis, the proposed clearing area is not likely to exhibit a higher level of floristic diversity than other areas in the bioregion.

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

Methodology

CALM (2002).
Ecotec (2009).
Outback Ecology (2009).
GIS Database:
-IBRA WA (Regions - Sub Regions).
-IBRA Australia.
-Pastoral Leases

(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 habitat assessment of the Bentley project area (which included the application area) was undertaken by Ecotec in September 2009. The project area included the following areas; Mining Leases 37/1153, 37/1132, 37/636 and Exploration Leases 37/829 and 37/899 (Ecotec, 2009). The fauna habitat assessment included a search of

- Department of Environment and Conservation's Threatened and Priority Species database to identify potential priority and threatened species occurring in the area; and

- Commonwealth Department of Environment, Water, Heritage and the Arts online database to identify fauna species potentially within the area that are protected under the *Environmental Protection and Biodiversity Conservation Act 1999*.

In addition, a reconnaissance site visit was undertaken, where the Bentley project area was traversed on foot and by vehicle. As a result of the reconnaissance survey, there was a total of 58 vertebrate species sighted including 36 birds, 10 mammals, 11 reptiles and 1 frog. There were no conservation significant fauna species recorded in the application area during the fauna habitat assessment (Ecotec, 2009).

The database search yielded eight conservation significant species which potentially could be found in the application area, including the Bilby (*Macrotis lagotis*), Peregrine Falcon (*Falco peregrines*), Australian Bustard (*Ardeotis australis*), Bush-stone curlew (*Burhinus grallarius*), Slender-billed thornbill (western) (*Acanthiza iredalei iredalei*), Rainbow bee-eater (*Merops ornatus*), Great Egret (*Ardea alba*), Oriental Plover (*Chardrius veredus*) and the Fork-tailed Swift (*Apus pacificus*).

This list has been further refined based on habitat preferences and known distributions. As a result, the following two species are considered as having the greatest potential to inhabit the application area:

The Peregrine Falcon (Schedule 4, other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2010*) is widespread across Australia including some continental islands but absent from most deserts and the Nullarbor Plain (Johnstone & Storr, 1998). Its habitat consists of areas such as cliffs along coasts, rivers and ranges, and about wooded watercourses and lakes (Johnstone & Storr, 1998). Ecotec (2009) have stated that this species has been recorded in the nearby Teutonic Bore pit during a survey undertaken at the Jaguar Project. However, this species has not been sighted in the application area, and there are no significant habitat features such as cliffs or rocky ranges which would pose significant nesting habitat for this species. Based on this, it is unlikely the proposed clearing would have a significant impact on the conservation status of this species.

The Bush-stone curlew (Priority 4 - DEC) is known to occur in the general area (Ecotec, 2009). During the fauna survey the mulga woodlands/shrublands was noted as having poor habitat value due to its sparse vegetation and reduced understorey. This type of vegetation is a habitat preference for the Bush-stone curlew, meaning; the application area represents suitable habitat for this species. However, no specimens of the Bush-stone curlew were recorded in the application area, and the mulga woodlands/shrublands habitat is well represented in the Goldfields region (Ecotec, 2009). Furthermore, this species is highly mobile and it is likely that this species would be able to move out of the area with the onset of clearing. Based on this, it is highly unlikely the conservation status of this species would be significantly impacted from the proposed clearing.

There were two fauna habitats recorded within the application area, these were: mulga woodland/shrublands and drainage lines (Ecotec, 2009). The majority of the application area was composed of mulga woodlands/shrublands which has been noted being of poor habitat value due to the lack of understorey present which provides little cover for ground dwelling animals (Ecotec, 2009).

The drainage lines were the most significant as they contained large trees and dense vegetation which is likely to provide nesting sites for a variety of bird species, and food refuge and water for many animals (Ecotec, 2009). The drainage line habitat is primarily found to the west of the application area in Sullivan Creek, and is unlikely to be significantly impacted from the proposed clearing (Ecotec, 2009). In areas to the east, clearing is proposed in several drainage line areas for the purpose of widening two existing tracks into a haul road and service corridor (Jabiru Metals, 2010). Given that these areas are already cleared and minimal vegetation needs to be cleared for widening, there is expected to be minimal impact on the overall condition of this habitat type.

Ecotec (2009) have stated that the fauna habitats present within the application area are typical of the northern Goldfields.

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

Methodology Ecotec (2009).
Jabiru Metals (2010).
Johnstone & Storr (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 Declared Rare Flora or Priority flora species found within the application area (GIS Database).

A flora and vegetation survey of the Bentley project area was undertaken by Outback Ecology in January 2009. The Bentley project area included the application area and surrounding mining tenements which are held by Jabiru Metals. In all, the following areas were surveyed: Mining Leases 37/1153, 37/1132, 37/636 and Exploration Leases 37/829 and 37/899 (Outback Ecology, 2009).

The flora and vegetation assessment involved a detailed database search and a reconnaissance survey to

document and describe the presence of all flora species, vegetation associations and species of conservation significance within the project area (Outback Ecology, 2009).

As a result of the onground survey, there were two Priority flora species recorded in the Bentley project area, those being; *Phyllanthus baeckeoides* (Priority 3) and *Calytrix erosipetala* (Priority 3).

Calytrix erosipetala was found on a rocky rise/outcrop in the far south-west of the Bentley project area, and was locally abundant. This population was recorded approximately 1.4 kilometres to the south of the application area (Outback Ecology, 2009).

Phyllanthus baeckeoides was found on one of two small rock hills in the north-east of the Bentley project area (Outback Ecology, 2009). This species was recorded approximately 470 metres to the east of the proposed haul road.

Neither of the two Priority flora species were recorded within the actual application area, therefore they are unlikely to be impacted from the proposed clearing.

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

Methodology Outback Ecology (2009).
GIS Database:
Declared Rare and Priority Flora List_1

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

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

According to available GIS Databases, there are no known Threatened Ecological Communities (TEC's) within a 30 kilometre radius of the application area (GIS Database). Outback Ecology (2009) did not locate any TEC's or Priority Ecological Communities within the application area. Given that there are no TEC's within the 30 kilometres of the application area, it is unlikely that any known TEC's would be compromised by the proposed clearing.

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

Methodology Outback Ecology (2009).
GIS Database:
-tec_sites_1

(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 Murchison Interim Biogeographic Regionalisation of Australia (IBRA) bioregion within which approximately 100% of the Pre-European vegetation remains (see table overleaf) (GIS Database; Shepherd, 2007).

The vegetation of the application area has been mapped as:

Beard Vegetation Association 18: Shrublands; *Acacia rostellifera* thicket; and

Beard Vegetation Association 28: Open low woodland; mulga.

According to Shepherd (2007) approximately 100% of both Beard Vegetation Association 18 and 28 remain at both a state and bioregional level. Therefore, the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

Whilst only a small percentage of the vegetation types within the Murchison bioregion are adequately protected within conservation reserves, the bioregion remains largely uncleared. As a result, the conservation of vegetation associations within the bioregion is not likely to be impacted by this proposal.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)*
IBRA Bioregion – Murchison	28,120,589.89	28,120,589.89	~100	Least Concern	1.06 (1.06)
Beard veg assoc. – State					
18	19,892,305	19,890,195	~100	Least Concern	2.1 (2.1)
28	395,895	395,895	~100	Least Concern	0
Beard veg assoc. – Bioregion					
18	12,403,172	12,403,172	~100	Least Concern	0.4 (0.4)
28	224,292	224,292	~100	Least Concern	0

* Shepherd (2007)

** 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 (2007).
GIS Database:
- Pre-European Vegetation_1.
- IBRA Australia.

(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 seven non-perennial watercourses which intersect the application area (GIS Database). Vegetation will be required to be cleared in each of these areas for the proposed haul road and service corridor (Jabiru Metals, 2010).

Outback Ecology (2009) have stated that vegetation within the drainage lines was denser and more diverse in creek and drainage lines of the application area. However, there were no vegetation associations noted as being riparian in nature in the application area (Outback Ecology, 2009).

Analysis of aerial photography indicates that ephemeral drainage lines are a common feature both locally (within a 50 kilometre radius) and regionally (within the Murchison bioregion) (GIS Database).

Jabiru Metals (2010) have stated that the following management measures will be implemented to manage impacts to vegetation associated with watercourses:

- Where the drainage lines intersect the haul route, long low profile spill-way type culverts will be installed which will be clad with rock;
- Drainage shoulders/V-notch drains will be implemented on either side of the haul road to manage soil erosion; and
- A system of bunds and diversion drains will be located adjacent to the foot of each waste dump and then any flow directed to a settlement pond located on the southern side of the dumps.

Given that the clearing proposal involves clearing of vegetation growing in, or in association with, an environment associated with a watercourse or wetland, the proposed clearing is at variance to this Principle. However, minimal vegetation will need to be cleared within these areas, and the mitigation measures outlined above by Jabiru Metals (2010) should adequately manage impacts to vegetation if implemented successfully.

Methodology Jabiru Metals (2010).
Outback Ecology (2009).
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 characterised by a gentle south-easterly sloping flood plain, adjacent to a broad incised drainage tract (Jabiru Metals, 2010). Drainage generally occurs through sheet flow in a north to south direction. There are also seven non-perennial drainage lines which intersect the application area, which run in a north to south-east orientation, eventually dispersing into Sullivan Creek; a major drainage tract found to the west of the application area (GIS Database).

There are three land systems found in the application area, namely; the Bevon, Jundee and Violet land systems (GIS Database).

The Bevon land system is described as irregular low ironstone hills, with stony lower slopes supporting mulga shrublands (Pringle et al., 1994). Within this land system the soils on breakaway slopes and drainage tracts are susceptible to soil erosion, particularly if perennial shrub cover is substantially reduced or the soil surface is disturbed.

The Jundee land system is described as gently inclined to level hardpan plains with ironstone gravel mantles, supporting mulga shrublands. Pringle et al., (1994) notes that impedance to natural sheet flows can initiate soil erosion and cause water starvation and consequent loss of vigour in vegetation downslope. The gravel mantles present provide effective protection against soil erosion.

The Violet land system is described as undulating stony and gravelly plains and low rises, supporting mulga shrublands (Pringle et al., 1994). This land system has abundant mantles which provide effective protection against soil erosion over most of the land system. In areas which have been disturbed such as the construction of gridlines and tracks the soil becomes moderately susceptible to soil erosion. The narrow drainage tracts within this system are also moderately susceptible to soil erosion if disturbed.

The land systems found within the application area are moderately protected from erosional forces as they have a stony mantle (Pringle et al., 1994). However, the removal of this stony mantle during the clearing process is likely to initiate some temporary erosion. Impedances to water flows from the construction of infrastructure may cause water starvation of vegetation downstream and thus loss of vegetation vigour (Pringle et al., 1994).

Based on this, clearing within drainage line areas is likely to cause some temporary water erosion. In particular, vegetation clearing for the haul road and service corridor where drainage is intersected are likely to be the areas at most risk.

Jabiru Metals (2010) have stated that the following management measures will be implemented to manage soil erosion and vegetation starvation during the project:

- Where the drainage lines intersect the haul route, long low profile spill-way type culverts will be installed which will be clad with rock;

- Drainage shoulders/V-notch drains will be implemented on either side of the haul road to manage soil erosion; and

- A system of bunds and diversion drains will be located adjacent to the foot of each waste dump and then any flow directed to a settlement pond located on the southern side of the dumps.

Given the risk of erosion occurring within the drainage tracts of the application area, the proposed clearing may be at variance to this Principle. However, the mitigation measures outlined above should adequately manage the risk of significant soil erosion occurring if successfully implemented. The assessing officer recommends that should a clearing permit be granted that a condition be imposed on the permit requiring staged clearing during the life of the project.

Methodology Jabiru Metals (2010).
Pringle et al., (1994).
GIS Database:

-Hydrography, linear (medium scale, 250k GA)
- Rangeland Land System Mapping.

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

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

The application area is not located within a conservation reserve (GIS Database). The Wanjarri Nature Reserve is located approximately 111 kilometres north-west of the application area at its nearest point (GIS Database).

Based on this distance, it is unlikely the environmental values of Wanjarri Nature Reserve will be compromised from the proposed clearing.

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 may be at variance to this Principle

According to available databases, the proposed clearing area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

The average annual rainfall within the application area is 200 millimetres and the average annual evaporation rate is 2,336 millimetres (Outback Ecology, 2009; GIS Database). Therefore, during normal rainfall events surface water in the application area is likely to evaporate quickly. However, during substantial rainfall events erosion may occur in cleared areas resulting in a higher sediment load. It is possible that some temporary erosion may result from clearing; especially where the haul road and service corridor intersect drainage line areas. In regards to the management of surface water flows within the application area, Jabiru Metals (2010) have committed to implement the following management measures:

- Where drainage lines intersect the haul route, long low profile spill-way type culverts will be installed which will be clad with rock;

- Drainage shoulders/V-notch drains will be implemented on either side of the haul road to manage soil erosion; and

- A system of bunds and diversion drains will be located adjacent to the foot of each waste dump and then any flow directed to a settlement pond located on the southern side of the dumps.

The application area is characterised by semi-saline groundwater of between 3,000-7,000 milligrams/Litre Total Dissolved Solids (GIS Database), whilst the depth of groundwater within the application area ranges from 10-50 metres (Jabiru Metals, 2010). It is unlikely the removal of 77.1 hectares of native vegetation is likely to significantly alter the existing groundwater depth or quality of groundwater within the application area.

Given the risk of erosion and thus sedimentation occurring within the drainage tracts of the application area, the proposed clearing may be at variance to this Principle. However, the mitigation measures outlined by Jabiru Metals, should be able to adequately manage the risk of significant soil erosion occurring.

Methodology Jabiru Metals (2010).
Outback Ecology (2009).
GIS Database:
- Evapotranspiration, Point Potential
- Groundwater Salinity, Statewide
- Hydrography, linear (medium scale, 250k GA)
- Public Drinking Water Source Areas (PDWSAs) - DOW

(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 climate of the region is described as arid to semi-arid with hot summers and cool winters. The average annual rainfall is 200 millimetres, with rains occurring in winter from cold fronts from the west, whilst in summer thunderstorms can produce heavy localised falls in short periods (Outback Ecology, 2009). Based on an average annual evaporation rate of 2,600 millimetres (GIS Database), any surface water resulting from rainfall events is likely to be relatively short lived.

The clearing of native vegetation is likely to result in an increase in surface water runoff; however, the proposed clearing is not likely to increase the incidence or intensity of flooding.

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

Methodology Outback Ecology (2009).
GIS Database:
- Evapotranspiration, Point Potential.
- Rainfall, Mean Annual.

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

Comments

There is one native title claim over the area under application: WC99/001 (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenements have 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 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 throughout 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 22 October 2009 inviting public comments. One submission was received on 12 March 2010. The submission pointed out that vegetation of the application area is significant from an ecological perspective, and is valuable to fauna species, which in turn provide indigenous people with food. The submission also stated that impacts to drainage lines should also be considered in the assessment. The concerns of this submission have been adequately addressed in the assessment of the following clearing principles:

- Impacts to ecological Integrity: Principle (a);
- Impacts to fauna habitat: Principle (b); and
- Impacts to drainage lines: Principles (f), (g) and (i).

In accordance with Section 51O of the *Environmental Protection Act 1986*, the CEO shall have regard to the Clearing Principles so far as they are relevant to the matter under consideration. In considering a clearing matter, the CEO shall also have regard to any planning instrument or other matter that the CEO considers relevant.

Some of the issues raised in the submission were outside the scope of the Clearing Principles. These included impacts of native vegetation clearing upon the social, cultural, spiritual and traditional life of Indigenous peoples in the local area. Other issues such as the vegetation being important for food, medicine, tools, firewood and ceremonial use were also raised.

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

4. Assessor's comments

Comment

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

Should a permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, staged clearing, record keeping and permit reporting.

5. References

- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. 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.
- Ecotec (2009) Fauna Habitat Assessment Bentley Project Area - Jabiru Metals. Unpublished Report prepared for Jabiru Metals September 2009.
- Jabiru Metals (2010) Supporting information for clearing permit application CPS 3584/1.
- Johnstone, R.E. & Storr, G.M. (1998) Handbook of Western Australian Birds. Western Australian Museum. Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Outback Ecology (2009) Jabiru Metals Bentley - Stage 1 Vegetation and Flora Survey. Unpublished report for Jabiru Metals.
- Pringle, H., Van Vreeswyk, A. and Gilligan, S. (1994) An Inventory and condition survey of the north-eastern Goldfields, Western Australia. Technical Bulletin 87. Department of Agriculture, Western Australia.
- Shepherd, D.P. (2007). 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. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.

6. Glossary

Acronyms:

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

Definitions:

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

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

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

Schedule 1	Schedule 1 – Fauna that is rare or likely to become extinct: being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
Schedule 2	Schedule 2 – Fauna that is presumed to be extinct: being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
Schedule 3	Schedule 3 – Birds protected under an international agreement: being birds that are subject to an

agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in 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.