



1. Application details

1.1. Permit application details

Permit application No.: 233/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Jabiru Metals Ltd (formerly Pilbara Mines Ltd)

1.3. Property details

Property: M37/44
M37/1153
M37/1132
M37/1169
M37/636
Local Government Area: Shire Of Leonora
Colloquial name: Jaguar Base Metals Project area

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
242		Mechanical Removal	Mining
15.4		Mechanical Removal	Mining

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
Beard Vegetation Association 18: Low woodland; mulga (Acacia aneura).	Vegetation to be cleared consists primarily of mulga (Acacia aneura) associated with flats and rocky outcrops. Some existing disturbed areas occur as a result not only of historical grazing regimes but also as a result of mining activities. (Jims Weeds Seeds & Trees 2004).	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994)	The description was based on the flora survey by Jims Seeds Weeds and Trees (2004) and photographs of the project area.
Beard Vegetation Association 28: Open low woodland; mulga. (Hopkins et al 2001, Shepherd et al 2001).			

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
	<p>Jabiru Metals Pty Ltd (2004) reports that the project area was dominated by mulga vegetation classified into three landforms - drainage lines, flats and stony hills. The project area is part of Tarmoola Station and all habitats were degraded to some degree from sheep and feral goat grazing. In addition soil and vegetation disturbance and disruption to drainage caused by previous mining activity was evident. Very little micro habitat existed for small reptiles and mammals and most sites had minimal understorey and/or ground cover. The soil was either stony or very hard thus precluding many burrowing species.</p> <p>Jims Seeds Weeds and Trees (2004) advise that most vegetation communities are in good condition with the exception of the old camp area which has been subject to weed invasion.</p> <p>Given consideration of the above it is unlikely that the biodiversity of the area subject to the clearing proposal is higher than other native vegetation within the local area or within the bioregion.</p>
Methodology	Jabiru Metals (2004) (DOE TRIM Ref ND615). Jims Seeds, Weeds And Trees (2004) (DOE TRIM Ref ND615).

(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

Jabiru Metals Ltd (2004) advise that CALM's Threatened and Priority fauna database identifies the following species that may occur within the project area:

S1 - Fauna that is rare or likely to become extinct - Bilby (*Macrotis lagotis*), Malleefowl (*Leipoa ocellata*) & Giant Desert Skink (*Egernia kintorei*).

S4 - Other specially protected fauna - Peregrine Falcon (*Falco peregrinus*).

P1 (Priority 1) Species - *Branchinella apophysata*.

Jabiru Metals Pty Ltd (2004) advise that a fauna survey was conducted by Biota Environmental Sciences at the Jaguar operation between 29 November and 6 December 2004. The project area was dominated by mulga vegetation which was further classified into three fauna habitats - drainage lines, flats and stony hills. The project area is part of Tarmoola Station and all habitats were degraded to some degree from sheep and feral goat grazing. In addition soil and vegetation disturbance and disruption to drainage caused by previous mining activity was evident. Very little micro habitat existed for small reptiles and mammals and most sites had minimal understorey and/or ground cover. The soil was either stony or very hard thus precluding many burrowing species.

The Peregrine Falcon (*Falco peregrinus*), which is an S4 species (fauna that is otherwise specially protected) was recorded during the survey. Two birds were observed hunting over the old mine pit each day of the survey. This species occurs across most of Australia in a wide variety of habitats and has a large home range typically of 20-1500 sq km. The area of disturbance associated with the proposed mine and infrastructure should not have an adverse effect on this species considering the large area of its home range.

Methodology Jabiru Metals Ltd (2004) (DOE TRIM Ref ND615).

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

Comments Proposal is at variance to this Principle

Keith Lindbeck and Associates (2005), supported by Jims Seeds Weeds and Trees (2004), advice that there are three species of priority flora identified in the initial proposed camp area and one species in the proposed flotation site area. Jabiru has adjusted its location for project infrastructure away from these species. The new village will be placed in the old mining camp area which may result in the removal of one or two *Phyllanthus baeckeoides* P1 plants that have germinated within the disturbed areas. The pipeline service corridor may potentially result in the removal of a few individual plants. Surveys have indicated the presence of at least 10,000 *Phyllanthus baeckeoides* P1 plants on three hills at Teutonic Bore. Jabiru Metals (formerly Pilbara Mines Ltd) has undertaken to protect these species from mining impacts, however in this instance permission to disturb 10-12 *Phyllanthus baeckeoides* plants has been obtained from CALM (see DOE Trim Ref .NI923 and NI925).

Methodology CALM (2004) (DOE TRIM Ref NI923).
Jims Seeds Weeds and Trees (2004) (DOE TRIM Ref ND615).
Keith Lindbeck and Associates (2005) (DOE TRIM Ref 654).
Pilbara Mines Ltd (2004) (DOE TRIM Ref NI925).
GIS Databases:
- Declared Rare and Priority Flora List - CALM 13/08/03.
[The comprehensiveness of the database is dependent on the amount of survey carried out in the area and does not necessarily represent a comprehensive listing].

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

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

There are no records of Threatened Ecological Communities within 60km of this proposal.

Methodology GIS Databases:
- Threatened Ecological Community Database - CALM 15/07/03.
[The comprehensiveness of the database is dependent on the amount of survey carried out in the area and does not necessarily represent a comprehensive listing].

(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 vegetation at the site is a component of Beard Associations 18 and 28 (Hopkins et al. 2001) of which there is ~100% and 99.9% of the pre-European extent remaining (Shepherd et al. 2001). These vegetation types are therefore of 'least concern' for biodiversity conservation (Department of Natural Resources and Environment (2002).

	Pre-European Area (ha)	Current extent (ha)	Remaining %*	Conservation status**	In Reserves/CALM-managed land, %
IBRA Bioregion; - Murchison	28,206,195	28,206,195	100.0	Least concern	
Shire - Leonora	3,174,300	~3,174,300	~100.0	Least concern	
Beard vegetation association: - 18:	24,675,970	24,659,110	99.9	Least concern	2.8
- 28:	355,797	355,797	100.0	Least concern	0.0

* (Shepherd et al. 2001)

** (Department of Natural Resources and Environment 2002)

Methodology Shepherd et al. (2001).
Hopkins et al. (2001).
Department of Natural Resources and Environment (2002).
GIS Databases:
- Pre-European Vegetation - DA 01/01;
- Interim Biogeographic Regionalisation of Australia - EA 18/10/00.

(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 five watercourses crossing proposed roads and another two, possibly three in the 242ha portion of the proposal.

Jabiru Metals (2005) advise that the watercourses are broad drainage lines that traverse the mining tenements from north to south. It is anticipated that the only clearing for infrastructure likely to impact the main regional drainage line is for crossings for road access and ventilation services for the underground mine. No clearing will occur in the main drainage lines. It is not anticipated that any of the infrastructure relating to the development or operation of the Jaguar Project will significantly effect hydrology for the region.

Methodology Jabiru Metals (2005)
GIS Databases:
- Hydrography, linear - DOE 01/02/04.

(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

Jabiru Metals (2005) advise that a drainage channel will be constructed to divert surface water away from the site infrastructure, reducing the likelihood of soil erosion.

Methodology Jabiru Metals (2005).

(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

No conservation areas have been identified within 10km of the proposal.

The benchmark of 15% representation in conservation reserves (JANIS Forests Criteria 1997) has not been met for Beard Vegetation Types 18 and 28. However because of the largely uncleared state of these vegetation types, this is not considered to be a serious conservation issue.

Methodology Hopkins et al. (2001).
Shepherd et al. (2001).
JANIS Forests Criteria (1997).
GIS Databases:
- CALM Managed Lands and Water - CALM 01/08/04.

(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

With an average annual rainfall of 200mm and an annual evaporation rate of 3,400mm there is little surface flow during normal seasonal rains. It is only during major rainfall events that there is any significant surface flow. Surface flow during these events tends to be relatively fresh. The saline lake system of the Salt Lake Basin of the Western Plateau becomes a medium for the collection and transportation of major flows.

With high annual evaporation rates and low annual rainfall there is little recharge into regional groundwater that at this site is considered brackish (between 1,000 mg/l and 3,000 mg/l). The proposed clearing of native vegetation for this proposal is unlikely to have an impact on regional groundwater considering the magnitude of the Yilgarn-Goldfields Groundwater Province (~300,000 sq km) and the extent of native vegetation remaining in the Murchison Bioregion (~100%).

Methodology GIS Databases:
- Evaporation Isopleths - BOM 09/98;
- Isohyets - BOM 09/98;
- Hydrography, linear - DOE 01/02/04;
- Hydrographic Catchments, Sub-catchments - DOE 01/07/03;
- Groundwater Provinces - WRC 98.

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

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

With an average annual rainfall of 200mm and an annual evaporation rate of 3,400mm there is little surface flow during normal seasonal rains. It is only during major rainfall events that there is a likelihood of flooding for which the broad valleys and lake systems of the region are designed to compensate and sustain floodwaters.

Methodology GIS Databases:
- Evaporation Isopleths - BOM 09/98;
- Isohyets - BOM 09/98;
- Hydrography, linear - DOE 01/02/04.

Planning instrument or other matter.

Comments

The Shire of Leonora provided no response to the invitation for comment forwarded 21 October 2004.

DOIR provided the following comments:

Jabiru Metal's Jaguar Project is a few km south of the old Teutonic Bore project. The ore bodies are essentially the same ie the waste characteristics will essentially be the same.

1. Teutonic Bore has a large disturbed and damaged area.
2. Infrastructure should be kept to a minimum on the alluvium/clay river bed south of the Teutonic Bore pit.

Jabiru Metals (pers comm 2005), in response to DOIR's comments, have advised that geochemically the ore bodies are not quite the same. Preliminary studies have shown that the Jaguar Project may not have the same acid rock issue that has occurred at Teutonic Bore. Utilising Teutonic Bore disturbed areas for facilities is not possible due to significant grades, and therefore future development, of copper and zinc occurring at Teutonic Bore. Establishment of a processing plant at Teutonic Bore is likely to sterilise the resource and the plant would have to be relocated at a later date should Teutonic Bore be further developed. The Jaguar Project is not of a size to handle the extra costs of developing facilities at Teutonic Bore for the Jaguar Project. There would also be restrictions on the progression of rehabilitation at Teutonic Bore. The box cut and processing plant will be developed to the west of the alluvium clay river bed south of Teutonic Bore. No impact is therefore expected on the bed of the watercourse.

Methodology DOIR (2004) Submission.

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mining	Mechanical Removal	242	Grant	Assessable criteria have been addressed for all ten principles. The proposal is at variance to Principles c and f. For Principle c, the proponent has identified approximately 10,000 plants within the mining tenement of the Priority Flora species <i>Phyllanthus baeckeodes</i> . In order to minimise the impact upon this species the proponent has adjusted the location for project infrastructure away from this species. The proponent has undertaken to protect this species from the impacts of mining and has received approval from CALM (2004) to disturb 10-12 individual plants of this species. In its approval letter CALM

(2004) stated that 'the description of strategies that are being employed to minimise the impact of your operations on this species indicate that the proposed operation will not have a significant impact on its conservation'.

With respect to Principle f, no clearing will occur in the main drainage lines and, with the exception of road crossings and other services, there will be minimal impact upon other natural drainage lines and. The proponent will construct a drain to divert surface water away from infrastructure.

There is one Aboriginal site of significance within this part of the proposal and two Native Title Claims. The proponent should liaise with the Department of Indigenous Affairs with respect to this matter.

This proposal is located within the Goldfields Groundwater Area. A license, available from the Department of Environment in Kalgoorlie, is required to extract groundwater for commercial purposes.

Mining Mechanical 15.4 **Grant**
Removal

An amendment was received on October 8 2004 to incorporate a 15.4ha proposal for a village in addition to the 242ha proposal for mining and associated infrastructure. The village is approximately 4km from the proposed mining operations.

Assessable criteria have been addressed. This part of the proposal may be at variance to Principle c due to the likelihood of one or two Priority Flora species *Phyllanthus baeckeodes* having to be removed. Approval for the removal of these have been granted from CALM as per the 242ha mining operations proposal.

There is one Aboriginal site of significance within this part of the proposal and two Native Title Claims. The proponent should liaise with the Department of Indigenous Affairs with respect to this matter.

5. References

- AGPS (2001) The national objective and targets for biodiversity conservation 2001-2005. Commonwealth of Australia, Canberra.
- CALM (2004) Correspondence (DOE TRIM Ref NI923).
- 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.
- DOIR (2004) Submission (DOE TRIM Ref ND543).
- Hopkins, A.J.M., Beeston, G.R. and Harvey J.M. (2001) A database on the vegetation of Western Australia. Stage 1. CALMScience after J. S. Beard, late 1960's to early 1980's Vegetation Survey of Western Australia, UWA Press.
- Jabiru Metals Ltd (2004) Information supplementary to the application. (DOE TRIM Ref ND615).
- Jabiru Metals Ltd (2005) Information supplementary to the application. (DOE TRIM Ref NI924).
- JANIS Forests Criteria (1997) Nationally agreed criteria for the establishment of a comprehensive, Adequate and Representative reserve System for Forests in Australia. A report by the Joint ANZECC/MCFFA National Forest Policy Statement Implementation Sub-committee. Regional Forests Agreement process. Commonwealth of Australia, Canberra.
- Jim's Seeds Weeds and Trees (2004) Flora Survey - Jaguar/Teutonic Bore for Pilbara Mines Limited - September 2004. (DOE TRIM Ref ND615).
- Keighery, BJ (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Keith Lindbeck & Associates (2005) Information supplementary to the application. (DOE TRIM Ref ND654).
- Pilbara Mines Ltd (2004) Correspondence. (DOE TRIM Ref NI925).
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.