



1. Application details

1.1. Permit application details

Permit application No.: 237/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: WMC Resources Ltd

1.3. Property details

Property: M53/167
M53/56
M53/165
M53/489
Local Government Area: Shire Of Wiluna
Colloquial name: Mt Keith Mine Operation

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
670.6		Mechanical Removal	Mining
5		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 39: Shrublands; mulga scrub (Hopkins et al 2001, Shepherd et al 2001).	Western Botanical (2004) advises the vegetation habitats within the proposal are dominated by Mulga (Acacia aneura) and includes a range of sclerophyllous shrubs such as Eremophila oldfieldii, E. oppositifolia, E. granitica, Senna artemisioides ssp. Sturtii, E. latrobei, Sida calyxhymenia, Scaevola spinescens, Ptilotus obovatus, Dodonaea petiolaris, D. rigida, D. microzyga and E. fraseri (Cockerton 2004).	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	Western Botanical (2004) reports that there are some disturbed areas of topsoil dumps, waste dumps, tracks, roads and an old campsite within the area under application.

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

WMC (2004) report six different vegetation habitats occurring within the area subject to the proposal with at least 7 species of frogs, 76 reptiles, 23 mammals and at least 150 species of bird. The area has an abundant and diverse invertebrate fauna assemblage.

However;

- the area has suffered disturbance historically from grazing;
- a small area of approximately 20-30ha within the area under application has previously been disturbed by mining activities;
- the proposed clearing for accommodation is adjacent to an existing village. Some historical disturbance from human activity is likely to have occurred;
- Vegetation representation in the area, the shire and the bioregion is well above the 30% threshold advocated by the National Objectives Targets for Biodiversity Conservation 2001-2005 (AGPS 2001): below this value, species extinction is believed to occur at an exponential rate and any further clearing may have irreversible consequences for the conservation of biodiversity and is, therefore, not supported (Department of Natural

Resources and Environment 2002; EPA 2000);

- Beard Vegetation Association 39 has >5,000,000ha of its pre-European extent remaining;
- The Wanjarri Nature Reserve is located approximately 4km and 9km from the accommodation village and proposed mining operations respectively. A majority of the nature reserve has the same Beard Vegetation Association as the area under application.

Based on the above, while the clearing may be at variance to the Principle, it is not likely to have a serious impact.

Methodology AGPS (2001).
Department of Natural Resources and Environment (2002).
WMC (2004) (DOE TRIM Ref IN18322).
Shepherd et al (2001).
Hopkins et al (2001).

(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 may be at variance to this Principle

CALM (2005a) reports that recent records identified the presence of threatened fauna, Mulgara (*Dasyercus cristicauda*) and Malleefowl (*Leipa ocellata*) in the Mt Keith area.

The supporting documentation accompanying the clearing application (WMC 2004) referred to a Mulgara survey that was carried out in 2000 that identified 'areas of habitat to the south and the north-east of current workings'. CALM (2005a) recommends that these areas be excluded from further development and that any activities proposed by the proponent for the immediate vicinity are compatible with the conservation status of the remaining Mulgara populations. CALM (2005a) recommends continuous monitoring of Mulgara by the proponent in association with CALM regional staff as part of a broader environmental management of the mine site.

Although the clearing may be at variance to this Principle, WMC (2004) have mapped known habitat of Mulgara which is primarily on sandy spinifex country and not the rocky, loamy upland country of the current proposal. CALM (pers comm 2005) advised that the Mulgara is the key fauna issue at this site and that WMC operations are avoiding known and likely habitat.

Methodology CALM (2005a) (DOE TRIM Ref HD19450).
WMC (2004) (DOE TRIM Ref IN18322).

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

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

WMC (2004) report that a detailed habitat-based vegetation survey of the vegetation map units recognised by DAWA (1995) was conducted by Landcare Services (1996) and that no declared flora species or areas of botanical significance were identified in the areas under application. WMC (pers comm 2005) reports that WMC has a state-wide database of Declared Rare and Priority Flora and that only Priority species and not DRF are identified on site at Mt Keith.

Initially, CALM (2005a) advised that when considering the number of Priority Listed Flora recorded on the same vegetation type to that under assessment there would appear to be a medium probability of flora of conservation significance existing on the proposed land to be cleared. While CALM acknowledged that a flora survey was conducted in 1996 (as specified in the proponent's clearing application), CALM considered that a more recent flora survey should be undertaken for a project of such extensive nature, noting that a number of these Priority Flora were not listed at the time of the survey. CALM recommended that a flora survey be undertaken by a qualified botanist at the appropriate time of year to ascertain whether any Rare and or Priority Listed Flora occurs at the site, and that the results of the survey are made available to CALM for review.

In addition to the previous surveys that have occurred within the project area, Geoff Cockerton (Western Botanical, 2004) surveyed the area subject to the clearing proposal for the specific purpose of identifying Declared Rare and Priority Flora. None were found.

With the benefit of this additional information that has only recently been provided, CALM (2005b) have indicated that their concerns have been adequately addressed and that a further botanical survey will not be necessary.

Methodology CALM (2005a) (DOE TRIM Ref HD19450).
CALM (2005b) (DOE TRIM Ref ND721).
Western Botanical (2004) (DOE TRIM Ref ND718).
WMC (2004) (DOE TRIM Ref IN18322).
DAWA (1995) (DOE TRIM Ref NI901).
Landcare Services Pty Ltd (1996) (DOE TRIM Ref NI901).

(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**
No Threatened Ecological Community is recorded within 10km of the proposal.

Methodology GIS Databases:
- Threatened Ecological Communities - CALM 15/7/03
- Environmentally Sensitive Areas - DOE 22/10/04.
[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 Vegetation Association 39 (Hopkins et al. 2001) of which there is ~100.0% of the pre-European extent remaining (Shepherd et al. 2001) and 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%	Least concern	
Shire - Wiluna	18,400,000	18,400,000	~100%	Least concern	
Beard vegetation association - 39	5,382,170	5,380,712	~100%	Least concern	11.8

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002)

Methodology Shepherd et al. (2001).
Hopkins et al. (2001).
GIS Database:
- Pre-European Vegetation - DA 01/01.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments **Proposal may be at variance to this Principle**
The proposed mining operations are located high in the landscape and six watercourses enter the area from the north-west. The direction of flow is to the south-east. WMC (2004) report that natural surface water drainage around the proposed mining operations has been significantly modified by previous mining activities. Surface water flowing from the Mt Keith Operation site does so via a network of drains that are part of the flood mitigation strategy for the operation.

The proposed accommodation area is 7km to the south of the proposed mining operations and is located at a low, mid-level in the landscape. A watercourse flows through the western part of this area in a north-easterly direction.

Methodology WMC (2004) (DOE TRIM Ref IN18322).
GIS Database:
- 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**
DAWA (2004) advise the proposed clearing of approximately 670.6ha of land for this proposal is not likely to cause appreciable on site and off site land degradation with the implementation of appropriate management strategies to address any resultant surface water runoff.

Methodology DAWA (2004) (TRIM Ref ND608).

(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**
Wanjarri Nature Reserve, a System 11 Reserve, is located approximately 4.3km ESE of the present accommodation village and approximately 9 km from the proposed mining operations. Initially, CALM (2005a)

advised of possible negative impacts from noise and increased public access pressure on Wanjarri Nature Reserve as a consequence of clearing and minesite expansion. However, CALM (pers comm 2005) further advised that negative impacts from noise is not likely to impact as much as previously indicated due to the distance s from the reserve. CALM (pers comm 2005) also acknowledged that the expansion of the existing mining operations is away from the Reserve and not closer. CALM (2005a) recommends that the proponent liaise closely with the Regional CALM Office throughout the proposed expansion project to mitigate any deleterious effects resulting from the mine being located in close proximity to Wanjarri Nature Reserve. In a Bioregion and Shire with close to 100% coverage of native vegetation, the proposed area is not required as an ecological link

Clearing the areas under application are unlikely to have an impact on the environmental values of Wanjarri Nature Reserve due to its distance form the clearing. Furthermore, the vegetation association of the reserve is the same as that of the local area (>5,000,000 ha)

Methodology CALM (2005a) (DOE TRIM Ref HD19450).
Hopkins et al (2001).
Shepherd et al (2001).
GIS Database:
- CALM Managed Lands and Water - CALM 01/08/04
- Pre-European Vegetation - DA 01/01.

(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 3.7m 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.

With high annual evaporation rates and low annual rainfall there is little recharge into the regional groundwater table which, at this site is between 1,000 mg/l and 3,000 mg/l and is considered to be brackish. The proposed clearing of native vegetation is unlikely to have an impact on regional groundwater considering the magnitude of the regional groundwater province (290 000 sq km) and the extent of native vegetation remaining in the region (~100%).

Methodology GIS databases:
- Isohyets - BOM 09/98
- Evaporation Isopleths - BOM 09/98
- Groundwater Salinity, Statewide - 22/02/00
- 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 3.7m 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.

WMC (2004) advise that in the twelve years Mt Keith has been operating, the flood mitigation works at the site in the forms of drainage and bunds have have been sufficient. Major rainfall/flood events during this period includes Cyclone Bobby in 1995.

Methodology WMC (2004) (DOE TRIM Ref IN18322).
GIS Databases:
- Isohyets - BOM 09/98.
- Evaporation Isopleths - BOM 09/98.
- Hydrography, linear - DOE 01/02/04.

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

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

The Shire of Wiluna has expressed no objection to the clearing in their submission however they are concerned about the large size of the area to be cleared. They do not have any information about current rehabilitation activities and would like some assurance that the Department of Environment will play a role in supervising proposed activities.

Methodology Shire of Wiluna (2004) (DOE TRIM Ref ND447).

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mining	Mechanical Removal	670.6	Grant	<p>Original proposal was made for 670.6 ha. Digitised area equals 485ha which includes 5 ha amended area (as itemised below).</p> <p>The proposal may be at variance to Principles a, b and f, each of which have been addressed.</p> <p>The proponent is advised to operate in accordance with the conditions under the Mining Lease.</p> <p>The proponent is advised to consult with CALM in terms of continuous monitoring of Mulgara and Mulgara requirements.</p> <p>The proposal is situated within the East Murchison Groundwater Area. The proponent may be required to amend their Groundwater Licence and should contact the Regional Office of the Department of Environment regarding this issue.</p> <p>The Department of Indigenous Affairs Database indicates that there is one Aboriginal Site of Significance within the proposed extension of the village accommodation. Other significant sites are in the local area. The proponent is advised to contact the Department of Indigenous Affairs on this issue.</p>
Mining	Mechanical Removal	5	Grant	<p>An amendment was made to extend the proposal by approximately 5ha.</p> <p>The proposal has been assessed inclusive of the 5ha amendment and the comments (as above) apply similarly.</p>

5. References

- AGPS (2001) The national objective and targets for biodiversity conservation 2001-2005. Commonwealth of Australia, Canberra.
- Agriculture Western Australia (1995) The Sensitivity and Conservation Value of land in the Region of Western Mining Corporation's Operations in the North-eastern Goldfields, Western Australia: A Report to Western Mining Corporation. Van Vreeswyk, S., Natural Resource Management Services. DOE TRIM Ref NI901.
- CALM (2005a) Land clearing proposal advice. Advice to A/Director General, Department of Environment (DoE). Department of Conservation and Land Management, Western Australia. DoE TRIM ref HD19450.
- CALM (2005b) Correspondence. DOE TRIM Ref ND721.
- DAWA (1995) An Ecological Assessment of Habitats in Mt Keith Operations Mining Area for Western Mining Corporation. Pringle, H., Department of Agriculture, Western Australia. DOE TRIM Ref NI901.
- DAWA (2004) Land degradation assessment advice. Office of the Commissioner of Soil and Land Conservation, Department of Agriculture Western Australia. DoE TRIM ref ND608.
- 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.
- EPA (2004) Guidance for the Assessment of Environmental Factors - terrestrial flora and vegetation surveys for Environmental Impact Assessment in Western Australia. Report by the EPA under the Environmental Protection Act 1986. No 51 WA.
- 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.
- 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.
- Keighery, BJ (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Landcare Services Pty Ltd (1996) Habitat Vegetation Survey (Vegetation Profiles), Mt Keith Operational Area. Cockerton, G.T.B. DOE TRIM Ref NI901.
- Landcare Services Pty Ltd (1997) Habitat Mapping Project, Mt Keith Operations. Cockerton, G.T.B. & Stratford, B. DOE TRIM Ref NI901.
- Landcare Services Pty Ltd (2002) Desktop Review of Priority and Declared Rare Flora, Wiluna Region, August 2002. Cockerton, G.T.B. DOE TRIM Ref NI901.
- Murcox Biological Services (1994) Vertebrate Fauna Species of the North-Eastern Goldfields: Report to Western Mining's Leinster and Mount Keith Operations. Murphy, D. DOE TRIM Ref NI901.
- Postle, A.C. (1996) A Preliminary Survey on the Abundance and Species Richness of the Invertebrate Fauna of the Mt Keith Mine Site. DOE TRIM Ref NI901.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status.

