



1. Application details

1.1. Permit application details

Permit application No.: 3057/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Cameco Australia Pty Ltd

1.3. Property details

Property:
Prospecting Licence 45/2632
Prospecting Licence 45/2633
Prospecting Licence 45/2634
Prospecting Licence 45/2635
Prospecting Licence 45/2636
Prospecting Licence 45/2637
Prospecting Licence 45/2638
Prospecting Licence 45/2639
Prospecting Licence 45/2640
Prospecting Licence 45/2641
Prospecting Licence 45/2642

Local Government Area: Shire of East Pilbara
Colloquial name: Kintyre Drilling Project

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia. Two Beard Vegetation Associations have been mapped within the application area (GIS Database; Shepherd et al., 2001):

- 99:** Hummock grasslands, shrub steppe; *Acacia coriacea* & hakea over hard spinifex, *Triodia basedowii*;
- 117:** Hummock grasslands, grass steppe; soft spinifex

Vegetation and flora studies of the Kintyre area were undertaken between 1986 and 1992 by Hart, Simpson and Associates (Cameco Australia Pty Ltd, 2009). A total of 26 vegetation units were recorded, and can be summarised by 7 main vegetation landform units (Hart, Simpson and Associates, 1994a):

1. Shrubs and Spinifex on flat plains with silty sands;
2. Stony hills and scree slopes;
3. Sand dunes and sandy soils;
4. River channels;
5. Shrublands and woodlands in drainage channels;
6. Clayey or silty soils; and
7. Claypans.

Additional flora and vegetation studies were undertaken in 2007 by Bennett Environmental Consulting. This confirmed the presence of 26 vegetation units, however it was noted that as a result of fires since the original survey some of the vegetation units were found to have blended across other vegetation units (Cameco Australia Pty Ltd, 2009). The following vegetation units were identified within the application area (Hart Simpson and Associates, 1994a; Bennett environmental Consulting, 2007):

Hummock Grass Steppe

A: Hard spinifex *Triodia wiseana*;

Tree Steppe

B: Trees of *Eucalyptus leucophloia* over the hard spinifex *Triodia wiseana*;

Woodlands

C: Woodland of *Eucalyptus centralis*;

D: Woodland of *Eucalyptus obtusa* in river channels;

Shrub Steppes

F1: *Acacia ancistrocarpa* and *A. ligulata* over the hard spinifex *Triodia basedowii*;

F2: *Acacia retivenia* over the hard spinifex *Triodia wiseana*;

F3: *Acacia inaequilatera* over the hard spinifex *Triodia basedowii* and the soft spinifex *Triodia pungens*;

F4: Mixed low shrubs over the hard spinifex *Triodia basedowii*;

F8: *Grevillea* and *Acacia* shrubs over mixed spinifex on sand;

F9: *Acacia dictyophleba* over the hard spinifex *Triodia basedowii*;

F10: *Acacia wanyu* over the hard spinifex *Triodia wiseana*;

G: Sparse shrubs over the hard spinifex *Triodia basedowii*;

Shrub Savanna

H: Cassias over grass;

Complexes

J: Sand dunes;

K: Claypans with little or no vegetation;

M: Sparse shrubs on clay soils;

N: Drainage lines of *Acacia* and other shrubs over the soft spinifex *Triodia pungens*;

Q: White quartzite scree slopes.

Cameco Australia Pty Ltd (2009) have indicated that the main vegetation units to be disturbed include:

A: Hard spinifex *Triodia wiseana*;

F1: *Acacia ancistrocarpa* and *A. ligulata* over the hard spinifex *Triodia basedowii*; and

F4: Mixed low shrubs over the hard spinifex *Triodia basedowii*.

There is also a possibility that the following vegetation units will be disturbed by the exploration activities (Cameco Australia Pty Ltd, 2009):

B: Trees of *Eucalyptus leucophloia* over the hard spinifex *Triodia wiseana*;

C: Woodland of *Eucalyptus centralis*;

D: Woodland of *Eucalyptus obtusa* in river channels;

M: Sparse shrubs on clay soils; and

N: Drainage lines of *Acacia* and other shrubs over the soft spinifex *Triodia pungens*.

Four alien weed species were recorded within the application area (Cameco Australia Pty Ltd, 2009). These were Buffel Grass (*Cenchrus ciliaris*), Kapok Bush (*Aerva javanica*), Beggars Ticks (*Bidens bipinnata*) and Ulcardo Melon (*Cucumis melo* subsp. *agrestis*) (Cameco Australia Pty Ltd, 2009). In addition, previous flora and vegetation surveys over the application area identified the alien weed species; Milk Thistle (*Sonchus oleraceus*), Jersey Cudweed (*Pseudognaphalium luteoalbum*), Double-gee (*Emex australis*), Wild Turnip (*Brassica tournefortii*) and the Ice Plant (*Mesembryanthemum crystallinum*) (Cameco Australia Pty Ltd, 2009).

Clearing Description

The applicant has applied to clear up to 44.5 hecatres of native vegetation within a 2,136 hectare area for the purpose of mineral exploration.

The exploration activities will involve an infill drilling programme and supporting hydrogeological and geotechnical investigations (Cameco Australia Pty Ltd, 2009).

Vegetation Condition

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994) to Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

Comment

The area under application was subject to uranium exploration drilling programs between 1986 and 1987, and from 1995 to 1998 (Cameco Australia Pty Ltd, 2009).

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 occurs within the Rudall (LSD1) sub-region of the Little Sandy Desert Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This sub-region is described as sparse shrub-steppe over *Triodia basedowii* on stony hills, with River Gum communities and bunch grasslands on alluvial deposits in and associated with ranges (CALM, 2001). There are extensive areas of tussock grass associated with footslopes and River Gum communities along drainage lines (CALM, 2001). Extensive *Triodia* hummock grasslands occur on hills and surrounding plains (CALM, 2001). Approximately 37.32% of the total land area in the Rudall sub-region is within the Rudall River National Park (CALM, 2001). Dominant land uses in the region include conservation, unallocated crown land, mining leases and aboriginal communities (CALM, 2001).

The Rudall subregion is known to support a diversity of arid zone reptiles, particularly skink lizards from the genera *Lerista* and *Ctenotus* (CALM, 2001). The upper Rudall River (draining into Lake Dora) is listed as a rare feature of the subregion given that it is one of only two arid zone rivers with near permanent wetlands along its course (CALM, 2001). These wetlands support a biologically diverse assemblage of waterbirds, and support riparian woodland communities that are not well represented elsewhere (Australian Heritage Database, 2009). The proposed clearing area is approximately 2.6 kilometres from the boundary of the Rudall River National Park at its nearest point (GIS Database). The Rudall River National Park is listed on the Register of the National Estate as an Environmentally Sensitive Area for its significance in maintaining on-going geomorphic and ecological processes within a tropical desert environment (Australian Heritage Database, 2009). In 1994, a small area of the Rudall River National Park was excised and the boundary changed to follow the geology and geomorphology of the Yandagooge Inlier rather than an arbitrary straight line (Cameco Australia Pty Ltd, 2009). The Kintyre area (including the area under application) was removed from the Rudall River National Park. This excised area remained on the Register of the National Estate, hence the requirement for this clearing permit application.

The area under application has been subject to uranium exploration activities between 1986 - 1987 and 1995 - 1998 (Cameco Australia Pty Ltd, 2009). Evidence of disturbance exists in the form of access tracks and drill lines (Cameco Australia Pty Ltd, 2009). Biodiversity values of the proposed clearing area are likely to have declined as a result of this disturbance. Impacts associated with the previous mineral exploration activities are likely to have included vegetation and habitat loss, fauna displacement and localised fragmentation.

A vegetation survey of the application area and surrounding vegetation identified 7 main vegetation landform units and 26 vegetation units (Cameco Australia Pty Ltd, 2009). During the vegetation survey, 270 flora species belonging to 45 families were recorded (Bennett Environmental Consulting, 2007). Poaceae (51), Malvaceae (19), Mimosaceae (19) and Papilionaceae (20) families are particularly species rich and diverse within the application area (Bennett Environmental Consulting, 2007).

Four alien weed species were recorded within the application area (Cameco Australia Pty Ltd, 2009). These were Buffel Grass (*Cenchrus ciliaris*), Kapok Bush (*Aerva javanica*), Beggars Ticks (*Bidens bipinnata*) and Ulcardo Melon (*Cucumis melo* subsp. *agrestis*) (Cameco Australia Pty Ltd, 2009). In addition, previous flora and vegetation surveys over the application area identified the alien weed species; Milk Thistle (*Sonchus oleraceus*), Jersey Cudweed (*Pseudognaphalium luteoalbum*), Double-gee (*Emex australis*), Wild Turnip (*Brassica tournefortii*) and the Ice Plant (*Mesembryanthemum crystallinum*) (Cameco Australia Pty Ltd, 2009). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. None of these species are listed as 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Agriculture and Food (DAFWA). Should the permit be granted, it is recommended that appropriate conditions be imposed on the permit for the purpose of weed management.

A number of introduced mammal species have previously been recorded in the Kintyre area. Hart, Simpson and Associates (1994a) reported that the camel (*Camelus dromedaris*) was common and widespread in the area. The camel was mostly observed in small groups, but herds of over 100 individuals were seen on occasion (Hart, Simpson and Associates, 1994a). The feral cat (*Felis catus*) was widespread but scarce. Other introduced animals sighted only once in the area include the fox (*Vulpes vulpes*) and the rabbit (*Oryctolagus cuniculus*). The house mouse (*Mus musculus*) was also trapped numerous times from the Kintyre area (Hart, Simpson and Associates Pty Ltd, 1994a). The current status of feral animals at the Kintyre area is not known, but based on the work undertaken by Hart, Simpson and Associates Pty Ltd (1994a) there are likely to be feral animals present within the proposed clearing area. Adverse impacts caused by the presence of feral animals include; predation of native fauna, competition with native fauna for food and habitats, overgrazing and trampling of native vegetation and soil compaction. All of these impacts are detrimental to biological diversity.

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

Methodology

Australian Heritage Database (2009)
Bennett Environmental Consulting (2007)
CALM (2001)

Cameco Australia Pty Ltd (2009)
Hart, Simpson and Associates (1994a)
GIS Database
- Interim Biogeographic Regionalisation of Australia

(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

In 2007, Bamford Consulting Ecologists were commissioned by Canning Resources Pty Ltd to carry out a review of the existing fauna information for the Kintyre area and to provide an updated and revised list of conservation significant fauna species likely to be present. Fauna surveys were conducted over the application area involving methods such as; on foot traverses, inspections of locations, opportunistic observations, trapping and spotlighting (Bamford Consulting Ecologists, 2007).

Bamford Consulting Ecologists recorded 5 Amphibian, 30 Mammalian, 66 Reptilian and 92 Avian species during the fauna survey including several species of conservation significance such as the Grey Falcon (*Falco hypoleucos*), Australian Bustard (*Ardeotis australis*), Rainbow Bee-eater (*Merops ornatus*) and the Northern Quoll (*Dasyurus hallucatus*) (Bamford Consulting Ecologists, 2007).

According to Bamford Consulting Ecologists (2007), while the application area is rich in fauna, the number of species recorded is not unusual based on previous surveys undertaken in the Pilbara and Great Sandy Desert. The landforms, vegetation and habitats within the application area are well-represented regionally, with watercourses and rocky hills being the rarest habitats, however these occur extensively within the nearby Rudall River National Park (Bamford Consulting Ecologists, 2007; CALM, 2001; GIS Database). The application area lacks the sort of mesic refugia, such as deep gorges or persistent waterholes, that can be expected to support populations of short range endemic invertebrates (Bamford Consulting Ecologists, 2009).

The application area has been previously disturbed by exploration activities carried out in the late 1980's and early 1990's (Cameco Australia Pty Ltd, 2009). As a result of this the disturbed areas were deep ripped when the exploration ceased and rehabilitated to a great extent (Bamford Consulting Ecologists, 2007). Furthermore, vegetation within the application area has been mapped at a broad scale as Beard Vegetation Associations 99 and 117 (GIS Database). Approximately 100% of each of these vegetation associations remain in the Rudall subregion, and approximately 30.8% and 43.7% are represented in conservation reserves respectively (Shepherd et al, 2001). It is therefore unlikely that the proposed clearing area represents significant habitat for any of these species in a regional context.

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

Methodology Bamford Consulting Ecologists (2007)
CALM (2001)
Cameco Australia Pty Ltd (2009)
GIS Database
- CALM Managed Lands and Waters
- Pre-European Vegetation

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

Comments Proposal may be at variance to this Principle

According to available databases, no Declared Rare Flora (DRF) or Priority Flora species occur within the application area (GIS Database).

Prior to a flora survey being undertaken a desktop database search of the Department of Environment and Conservation's (DEC) Rare and Priority Flora Database was carried out by Cameco Australia Pty Ltd (2009). According to these searches 27 Priority flora species may occur within the application area (Cameco Australia Pty Ltd, 2009). A search of the Western Australian Herbarium database was also carried out by Cameco Australia Pty Ltd (2009), whereby five Priority flora species were identified as potentially occurring within the application area.

Five Priority Flora species have previously been recorded from the Rudall subregion, two of these by Hart, Simpson and Associates Pty Ltd (1994b; 1997), and three other species recorded as collected by Hart at Rudall in the collections of the Western Australian Herbarium (Cameco Australia Pty Ltd, 2009). These five species include:

P2 - *Acacia auripila*, *Goodenia hartiana* and *Thysanotus* sp. Desert East of Newman;

P4 - *Acacia balsamea* and *Ptilotus mollis*.

In October 2007, Bennett Environmental Consulting (Bennett Environmental Consulting, 2007) identified one Priority 3 flora species during a flora survey. This was *Comesperma pallidum*, however only one plant of this

species was observed within the application area (Cameco Australia Pty Ltd, 2009).

Of the six Priority Flora species recorded above, only one plant of *Comesperma pallidum* was recorded from within the proposed drilling disturbance area (Cameco Australia Pty Ltd, 2009; Bennett Environmental Consulting, 2007). However, based on habitat preferences and known distributions, it is possible that any of the above listed Priority species may be present within the application area (Western Australian Herbarium, 2009).

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

Methodology Bennett Environmental Consulting (2007)
Cameco Australia Pty Ltd (2009)
Hart, Simpson and Associates Pty Ltd (1994b)
Hart, Simpson and Associates Pty Ltd (1997)
Western Australian Herbarium (2009)
GIS Database
- Declared Rare and Priority Flora List

(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 reveals that there are no Threatened Ecological Communities (TEC's) within the application area (GIS Database).

The nearest TEC is located approximately 247 kilometres to the south-west of the application area. It is not expected that the proposed clearing will impact the conservation of this TEC.

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

Methodology GIS Database
- Threatened Ecological Communities

(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 IBRA Little Sandy Desert Bioregion (GIS Database). Shepherd et al. (2001) report that approximately 100% of the pre-European vegetation still exists in this Bioregion.

The vegetation in the application area is recorded as Beard Vegetation Associations 99: Hummock grasslands, shrub steppe; *Acacia coriacea* & hakea over hard spinifex, *Triodia basedowii*; and 117: Hummock grasslands, grass steppe; soft spinifex (GIS Database; Shepherd et al., 2001).

According to Shepherd et al., (2001) approximately 100% of Beard Vegetation Associations 99 and 117 remain within the Little Sandy Desert Bioregion (see table below).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Little Sandy Desert	11,089,900	11,089,900	~100.0	Least Concern	~4.6
Beard veg assoc. – State					
99	528,693	528,693	~100.0	Least Concern	~27.0
117	919,751	886,791	~96.4	Least Concern	~13.2
Beard veg assoc. – Bioregion					
99	526,656	526,656	~100.0	Least Concern	~27.0
117	287,251	287,251	~100.0	Least Concern	~36.2

* Shepherd et al. (2001) updated 2005

** 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 et al. (2001) updated 2005
GIS Database
- Pre-European Vegetation
- Interim Biogeographic Regionalisation for 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**

According to available GIS datasets, there are no known permanent watercourses or water bodies within the application area (GIS Database).

The south branch of the Yandagooge Creek flows through the application area, and based on vegetation mapping conducted by Hart, Simpson and Associates Pty Ltd (1994a) and confirmed by Bennett (2007) there would appear to be riparian vegetation present within and surrounding this creek (GIS Database; Cameco Australia Pty Ltd, 2009). The following vegetation communities are present within the application area and are indicative of riparian vegetation:

- Woodland of *Eucalyptus centralis*;
- Woodland of *Eucalyptus obtusa* in river channels; and
- Drainage lines of *Acacia* and other shrubs over the soft spinifex *Triodia pungens*.

The vegetation associated with the south branch of the Yandagooge Creek and any associated drainage channels is likely to be a fauna refuge and as such disturbance should be kept to a minimum.

Based on the above, the proposed clearing is at variance to this Principle. The application area has suffered prior disturbance as a result of access tracks used for previous exploration studies. These access tracks, including those crossing the Yandagooge Creek, will be utilised where practicable by Cameco Australia Pty Ltd and therefore minimal clearing will be required, so reducing the impact to riparian vegetation.

Methodology Bennett (2007)
Cameco Australia Pty Ltd (2009)
Hart, Simpson and Associates Pty Ltd (1994a)
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 proposed clearing area lies within a broad valley bounded by the Broadhurst Range to the east and the Throssell Range to the west (Corporate Environmental Consultancy Pty Ltd, 2007). The south branch of the Yandagooge Creek meanders through the application area (Corporate Environmental Consultancy Pty Ltd, 2007).

Dames & Moore (1997) conducted a soil survey of the Kintyre area in 1996 and mapped the following seven soil types:

1. Red, deep sand on flat plains;
2. Rock fragments in sandy loam matrix, on stony hills and scree slopes;
3. Red sandy loam and silty sand on claypan areas and old drainage lines;
4. Red sand, aeolian, in scattered patches and minor dunes;
5. Red loose sand, alluvial, levee banks and marginal to major drainage lines;
6. Loose sand with gravel bars and lenses in active drainage lines; and
7. Rock outcrops, minor colluvium.

The clearing permit application area is dominated by red, deep sand (more than 2 metres thick) on flat plains (Dames & Moore, 1997).

Based on the above, there is a moderate risk of soil erosion by both wind and water. The following erosion management measures will be implemented by the proponent (Cameco Australia Pty Ltd, 2009):

- minimising the area of land disturbed for the evaluation activities thereby reducing the potential for erosion;
- identifying and avoid disturbing areas with high erosion potential;
- installing proper drainage systems on tracks;

- positioning tracks along the contour and avoiding steep gradients;
- considering drainage patterns when establishing drillpads and tracks;
- constructing trenches and costeans across slopes rather than down slopes; and
- rehabilitating disturbed areas as soon as practicable.

Based on the above, the proposed clearing may be at variance to this Principle. However, the risk of land degradation can be reduced by the implementation of appropriate management measures such as those outlined above. Should a permit be granted, it is recommended that a condition be imposed on the permit to retain the vegetative material and topsoil.

Methodology Cameco Australia Pty Ltd (2009)
Corporate Environmental Consultancy Pty Ltd (2007)
Dames & Moore (1997)

(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 Kintyre resource area was formally part of the Rudall River National Park (A34607) which was proclaimed in 1977 (Cameco Australia Pty Ltd, 2009). However, in 1994 the boundary of the Rudall River National Park was changed to follow the geology and geomorphology of the Yandagooge Inlier rather than an arbitrary straight line (Cameco Australia Pty Ltd, 2009). The area excised from the Rudall River National Park included the Kintyre resource area, including the area under application for this clearing permit (Cameco Australia Pty Ltd, 2009). The current Rudall River National Park boundary is approximately 2.6 kilometres south of the purpose permit boundary for this clearing permit application (GIS Database).

Despite being excised from the Rudall River National Park, the Kintyre area remains listed on the Register of National Estate (GIS Database). The Rudall River National Park was placed on the Register when it was initially proclaimed in 1977, however the excised portion of the National Park has never been removed from the Register (Cameco Australia Pty Ltd, 2009).

The Rudall River National Park is a significant transition zone for flora and fauna between the Great sandy Desert to the north, the Little Sandy Desert to the south and the semi-arid Pilbara to the west (Australian Heritage Database, 2009). It is on the Register of the National Estate for its significance in maintaining on-going geomorphic and ecological processes within a tropical desert environment (Australian Heritage Database, 2009).

The National Park is rich in biodiversity, containing more than 400 flora species, including riparian woodlands which are not well represented elsewhere (Australian Heritage Database, 2009). The area acts as refugium habitat for numerous rare species of flora and fauna of the Great Sandy Desert, contains 90% of the total bird fauna of the Great Sandy Desert, contains Lake Dora which periodically acts as an important waterbird habitat, and contains an important population of the rare greater Bilby (*Macrotis lagotis*) on the eastern side of Lake Dora (Australian Heritage Database, 2009). In addition to this, Rudall River National Park contains 6 of the 9 frog species found in the Great Sandy Desert, and has a diverse and varied reptile fauna (Australian Heritage Database, 2009).

The area under application has been historically disturbed by access tracks and exploration drilling, and is therefore unlikely to be contributing important environmental values to the nearby Rudall River National Park. The area contains vegetation types and habitats which are well represented and conserved within the 1,569,459 hectare Rudall River National Park (GIS Database; Australian Heritage Database, 2009). The small area under application (44.5 hectares) is highly unlikely to be acting as an important buffer for, or ecological linkage to the Rudall River National Park given its level of historic disturbance, and the fact that the area surrounding Rudall River National Park is largely uncleared.

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

Methodology Australian Heritage Database (2009)
Cameco Australia Pty Ltd (2009)
GIS Database
- CALM Managed Lands and Waters
- 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

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

If unmanaged, the proposed clearing has the potential to affect the water quality of surface water in the

following ways;

- Natural drainage channels may be affected and the shape, location and profiles of the water courses altered;
- Sediment load and depositional pattern of the watercourses may be altered; and
- Pollution potential from erosion from disturbed areas, and spillages from the activities (Cameco Australia Pty Ltd, 2009).

However, the proponent will implement surface water management strategies to minimise any impacts on natural surface drainage patterns, minimise erosion potential and avoid contamination from spillages (Cameco Australia Pty Ltd, 2009).

The application area is located within the Paterson Groundwater Province (GIS Database). The groundwater salinity within the application area is approximately 1,000 - 3,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). Groundwater at the site may be impacted by the abstraction of groundwater for camp and drilling (Cameco Australia Pty Ltd, 2009). However, the volume of water required to be abstracted for the evaluation study (~30,000 kiloLitres/year) is unlikely to cause any impact to the groundwater resources within the region and therefore is not likely to impact on groundwater dependent vegetation in the area (Cameco Australia Pty Ltd, 2009).

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

Methodology Cameco Australia Pty Ltd (2009)
GIS Database
- Groundwater - Provinces
- Groundwater Salinity
- Potential Groundwater Dependent Ecosystems
- Public Drinking Water Source Area

(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 Rudall subregion experiences an arid climate with hot summers and warm dry winters (CALM, 2001). Meteorological monitoring was undertaken in the Kintyre area between 1987 - 1992, and recommenced in 1996 - 1997, whereby a number of climatic variables such as temperature, rainfall, evaporation, and humidity were measured (Cameco Australia Pty Ltd, 2009).

The Kintyre area had an average annual rainfall of 232 millimetres during the 1987 - 1992 monitoring period (Cameco Australia Pty Ltd, 2009). Average annual evaporation at the Kintyre area far exceeds rainfall, and was approximately 3,800 millimetres during the 1987 - 1992 and 1996 - 1997 monitoring periods (Cameco Australia Pty Ltd, 2009). It is therefore expected that there would be little surface water flows during normal seasonal rains.

The proposed clearing activities are within the upper reaches of the Yandagooge Creek catchment, which forms a broad vally bounded by flat topped hills (Cameco Australia Pty Ltd, 2009). The Yandagooge Creek feeds into the Coolbro Creek further to the north, which disperses water into the sandridges of the Great Sandy Desert (Cameco Australia Pty Ltd, 2009). The proposed clearing is not expected to increase the incidence or intensity of natural flood events, which may occasionally occur following cyclonic activity.

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

Methodology CALM (2001)
Cameco Australia Pty Ltd (2009)

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

Comments

There is one native title claim (WC96/078) over the area under application. This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the 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*.

There is one known Aboriginal site of significance within the application area (ID_11786) (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.

No public submissions were received in regard to this Clearing Permit application.

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

4. Assessor's comments

Comment

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

It is recommended that should a permit be granted, conditions be imposed on the permit for the purpose of weed control, retaining vegetative material and topsoil, record keeping and permit reporting.

5. References

- Australian Heritage Database (2009) Rudall River National Park (1978 boundary), Rudall River via Telfer, WA
<http://www.environment.gov.au/cgi-bin/ahdb/search.pl> (Accessed 5 May 2009)
- Bamford Consulting Ecologists (2007) Kintyre Project Area. Fauna observations from site visit, October 2007. Prepared for Canning Resources Pty Ltd. Unpublished report dated November 2007
- Bennett Environmental Consulting (2007) Flora and Vegetation Kintyre Leases. Prepared for Canning Resources. Unpublished report dated August 2007
- CALM (2001) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Little Sandy Desert 1 (LSD1 - Rudall subregion)
- Cameco Australia Pty Ltd (2009) Kintyre Project - Native Vegetation Clearing Permit (Drilling) Supplementary Information. Unpublished Report dated March 2009
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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
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 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.