



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 6918/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Saracen Metals Pty Ltd

### 1.3. Property details

Property: Mining Lease 37/46  
Mining Lease 37/219  
Mining Lease 37/564  
Mining Lease 37/902  
Mining Lease 37/955  
Mining Lease 37/986

Local Government Area: City of Leonra

Colloquial name: Kailis Project

### 1.4. Application

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

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 24 March 2016

## 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 for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database):

**Beard vegetation association 18:** Low woodland; mulga (*Acacia aneura*); and  
**Beard vegetation association 28:** Open low woodland; mulga.

A flora survey covering the Kailis area was undertaken by Matisse Consulting (2008) in November 2007. During November 2014, environmental scientists employed by St Barbara conducted a floristic survey to the south of the Kailis Central pit, to extend the dataset gathered during the 2007 Matisse flora survey (Saracen, 2016). Based off these surveys, six broad vegetation types have been identified within the application area:

A1: Woodland of *Acacia aneura* var. *aneura* and *Acacia craspedocarpa* over *Acacia tetragonophylla*, *Santalum lanceolatum* and *Eremophila longifolia* shrubs, over *Ptilotus obovatus* and *Eremophila* spp. over *Enneapogon caerulescens* and other grasses on flow lines.

A2: Shrubland of *Acacia ayersiana* and *Acacia aneura* var. *aneura* over *Acacia tetragonophylla* tall shrubs over *Eremophila forrestii* subsp. *forrestii*, *Eremophila platycalyx* subsp. *platycalyx* shrubs and *Dianella revoluta* over *Ptilotus obovatus* and *Poaceae* spp. on clay flats with patches of stony mantle.

A3: Open Shrubland of *Acacia aneura* var. *aneura*, *Acacia aneura* var. *intermedia* and *Acacia ayersiana* over *Acacia tetragonophylla* over *Eremophila forrestii* subsp. *forrestii*, *Eremophila platycalyx* subsp. *platycalyx*, *Ptilotus obovatus*, *Solanum lasiophyllum* over *Eragrostis eriopoda* and *Aristida contorta* on flats and lower slopes on red/brown clay loams with quartz and ironstone mantles.

A4: Open Shrubland of *Acacia aneura* var. *aneura* and *Acacia ayersiana* over *Acacia tetragonophylla* over *Eremophila platycalyx* subsp. *platycalyx*, *Ptilotus obovatus*, *Maireana triptera* over *Enneapogon caerulescens*, *Cymbopogon ambiguus* on red/brown clay loams on lower slopes and flats.

A5: Open Shrubland of *Acacia aneura* var. *aneura*, *Acacia aneura* var. *conifera* over *Acacia tetragonophylla* and *Acacia victoriae* over *Eremophila platycalyx* subsp. *platycalyx*, *Ptilotus obovatus* and *Solanum lasiophyllum* over *Aristida contorta*, *Maireana triptera* and *Sclerolaena cuneata* on red/brown clay on slopes with scattered patches of quartz and calcrete.

A6: Open Shrubland of *Acacia aneura* var. *fuliginea* and *Acacia jamesiana* over *Acacia tetragonophylla* over *Eremophila platycalyx* subsp. *platycalyx*, *Scaevola spinescens*, *Senna artemisioides* subsp. *filifolia*, *Atriplex nummularia*, *Ptilotus obovatus* over *Maireana ?triptera* and grasses on red/brown clays on rises with calcrete and

quartz.

<b>Clearing Description</b>	Kailis Project Saracen Metals Pty Ltd (Saracen) proposes to clear up to 100 hectares of native vegetation within a total boundary area of approximately 439.6 hectares for the purpose of mineral production. The proposal is located approximately 4 kilometres north-west of Leonora in the Shire of Leonora.
<b>Vegetation Condition</b>	Very Good: Vegetation structure altered, obvious signs of disturbance (Keighery, 1994); To Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
<b>Comment</b>	The vegetation condition was assessed by botanists from Mattiske Consulting Pty Ltd (2008) and via imagery of the application area (GIS Database).

### 3. Assessment of application against clearing principles

#### (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

<b>Comments</b>	<p><b>Proposal is not likely to be at variance to this Principle</b></p> <p>The application area is located approximately 4 kilometres north-west of Leonora in the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Eastern Murchison subregion is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development (Cowan, 2002). Vegetation of the subregion is dominated by Mulga woodlands (often rich in ephemerals), hummock grasslands, saltbush shrublands and Halosarcia shrublands (Cowan, 2002). Pastoral grazing occurs over a vast majority of the subregion, and consequently, much of the subregion has been severely degraded by feral herbivores. Mining for gold and nickel in the region is considerable, with most mining tenements occurring on pastoral land (Cowan, 2002).</p> <p>The proposed clearing area is partially located on the Braemore Pastoral Station (GIS Database) and is consequently severely overgrazed (Saracen, 2016). Much of the area has also been subject to historical disturbances from mining activity, with two existing open cut pits, two waste rock landforms, access tracks and various other cleared areas present on site (Saracen, 2016; GIS Database). The flora and vegetation proposed to clear was surveyed by Mattiske Consulting Pty Ltd (2008), and identified 76 taxa, from 32 genera and 19 families in the area. The vegetation assemblages recorded from the area are not significant in a local or regional context, and none are protected under legislation (Pringle et al., 1994). All the vegetation assemblages are dominated by <i>Acacia aneura</i> and differences in these are generally due to the density of <i>Acacia aneura</i> and dominance of understorey shrubs (Saracen, 2016).</p> <p>There are no known Threatened Flora or Priority flora species, Threatened Ecological Communities or Priority Ecological Communities recorded within the application area (Mattiske Consulting Pty Ltd, 2008; Saracen, 2016; GIS Database).</p> <p>No Weeds of National Significance or Declared Pests under the <i>Biosecurity and Agricultural Management Act 2007</i> were recorded during the survey, however three introduced flora taxa were recorded. 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. The potential spread of introduced species as a result of the proposed clearing may be minimised by the implementation of a weed management condition.</p> <p>A Level 1 fauna survey was conducted by Bamford Consulting Ecologists (Bamford) over the application area in January 2008 (Bamford, 2008). From a faunal perspective, the proposed clearing area contains habitats that are widespread in a regional context and are not deemed to be significant (Bamford, 2008). The assemblage of vertebrate fauna expected in the survey area is typical of the Eastern Murchison subregion. Some species of conservation significance may utilise habitats in the proposed clearing area from time to time, but none would be dependent on the area (Bamford, 2008).</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this Principle.</p>
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<b>Methodology</b>	Bamford (2008) Cowan (2002) Mattiske Consulting Pty Ltd (2008) Pringle et al., (1994) Saracen (2016)  GIS Database: - IBRA WA (Regions - Sub Regions) - Threatened and Priority Flora - Threatened Ecological Sites Buffered
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**(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**

Bamford Consulting Ecologists (2008) undertook a Level 1 fauna assessment of the Kailis Project area in January 2008. Desktop database searches and literature reviews were conducted to provide an inventory of species potentially occurring in the project area. Field reconnaissance was undertaken on 14 and 15 January 2008 to describe the habitat values of the site, to search for species of conservation significance, to describe potential impacts of vegetation clearing and to make recommendations to minimise, mitigate and manage impacts to fauna.

Bamford Consulting Ecologists (2008) recorded eight major habitats within the survey area, five of which are present within the proposed clearing area:

1. Gently undulating stony plains supporting sparse Mulga over Chenopod shrubland;
2. Mulga woodland on hardpan;
3. Major incised creekline supporting dense Mulga woodland and fringing riparian vegetation;
4. Minor drainage tracts supporting Mulga woodland;
5. Low lying floodplains and depressions supporting halophytic chenopad Shrubland.

Habitat 1 is the most extensive habitat in the project area and is widespread in the Leonora region (Bamford, 2008). A large proportion of this habitat in the project area has been disturbed by previous mining activities. The proposed clearing of this habitat is not likely to be significant given the level of degradation and widespread nature of the habitat.

Habitat 2 is also widespread in the region but is likely to support higher species diversity than habitat 1 due to a relatively high vegetation cover in comparison to the surrounding landscape. This habitat includes minor drainage areas (like that occurring between the two existing Kailis waste rock landforms).

Habitat 3 is uncommon within the Leonora area and is considered a distinctive habitat that provides corridors for movement of fauna across the landscape (Bamford, 2008). The drainage tract also contains seasonal pools which provide an important resource after rainfall for many nomadic and uncommon species, and also provides breeding opportunities for local fauna (Bamford, 2008). Some conservation significant species may occur in this habitat such as mygalomorph spiders. The small area, linkage function, concentration of biodiversity and possibility of the area being utilised by conservation significant species make this habitat type moderate to high in conservation significance (Bamford, 2008). Potential impacts to this habitat may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

Habitat 4 is well represented within the region, although occur as small and linear areas in the project area (Bamford, 2008). This habitat type may support some species of conservation significance including mygalomorph spiders and specialist burrowing fauna species including short range endemics. Fauna diversity and abundance is likely to be relatively high due to the increased vegetation cover associated with this habitat. Potential impacts to this habitat may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

Habitat 5 is well represented outside of the application area, and the proposed impact by the disturbance footprint is small. This habitat type has the potential to support a number of migratory species, however the small areas occurring within the Kailis project area are unlikely to support conservation significant vertebrates (Bamford, 2008). In the Leonora area, this habitat type is usually found around the vicinity of Lake Raeside which is located approximately 7.5 kilometres south of the application area (Saracen, 2016).

Impacts associated with vegetation clearing are likely to include (Bamford Consulting Ecologists, 2008):

- loss of habitat for foraging and shelter;
- habitat fragmentation;
- mortality during clearing operations;
- alteration of local hydrology;
- alteration of natural fire regime; and
- disturbance from noise and dust.

Other impacts to fauna such as increased road kill (especially of slower moving species) and an increase in the number of introduced predators are also expected; however these impacts are more closely associated with the mining operation itself as opposed to the clearing of native vegetation. The management of such impacts will be addressed during the assessment of the Mining Proposal, as required under the provisions of the *Mining Act 1978*.

Overall, Bamford Consulting Ecologists (2008) concluded that the assemblage of vertebrate fauna expected in the survey area is typical of the Eastern Murchison subregion. Most species expected are widespread, however a few may have restricted or habitat limited distributions. The survey area contains mostly widespread and common habitats, apart from one significant habitat which should remain undisturbed, the major incised creekline. Potential impacts to this habitat type may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

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

**Methodology** Bamford (2008)  
Saracen (2016)

**(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 records of Threatened Flora within the application area (DPaW, 2016; GIS Database).

The flora and vegetation survey conducted by Mattiske Consulting Pty Ltd (2008) over the application area did not record any species of Threatened Flora.

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

**Methodology** DPaW (2016)  
Mattiske Consulting Pty Ltd (2008)

GIS Database:  
- Threatened and Priority Flora

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

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

According to available databases, there are no known Threatened Ecological Communities (TEC's) in the proposed clearing area (GIS Database). The nearest known TEC is located approximately 145 kilometres north-west of the proposed clearing area.

The flora and vegetation survey conducted by Mattiske Consulting Pty Ltd (2008) over the application area did not record any Threatened Ecological Communities.

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

**Methodology** Mattiske Consulting Pty Ltd (2008)

GIS Database:  
- Threatened Ecological Sites Buffered

**(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

**Comments Proposal is not at variance to this Principle**

The application area is within the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database) in which approximately 99% of the pre-European vegetation remains (Government of Western Australia, 2014).

The vegetation in the application area is broadly mapped as Beard vegetation associations 18 and 28 (GIS Database):

18: Low woodland; mulga (*Acacia aneura*); and  
28 - Open low woodland; Mulga.

There is approximately 99% and 98% of the pre-European vegetation remaining of Beard vegetation associations 18 and 28 respectively in the Murchison bioregion (Government of Western Australia, 2014). Whilst both vegetation associations are poorly represented in reserves, the area proposed to clear does not represent a significant remnant of vegetation in the wider regional area. The proposed clearing will not reduce the extent of Beard vegetation associations 18 or 28 below current recognised threshold levels, below which species loss increases significantly.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPAW Managed Lands
IBRA Bioregion - Murchison	28,120,587	28,044,823	~99	Least Concern	~7.69
Beard vegetation associations - State					
18	19,892,305	19,843,727	~99	Least Concern	~6.29
28	365,895	392,172	~99	Least Concern	~0
Beard vegetation associations - Bioregion					
18	12,403,172	12,363,252	~99	Least Concern	~4.96
28	224,291	220,584	~98	Least Concern	~0

\* Government of Western Australia (2014)

\*\* 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)  
Government of Western Australia (2014)

GIS Database:  
- IBRA WA (regions – subregions)  
- Pre-European Vegetation

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

**Comments Proposal is at variance to this Principle**

There are no permanent natural water bodies or watercourses within or in close proximity to the application area (GIS Database). The only permanent surface water present is exposure of the groundwater table in the open pit (Saracen, 2016).

An ephemeral drainage line and two creeklines are present within the north and south of the application area. The vegetation community 'A1: Woodland of *Acacia aneura* var. *aneura* and *Acacia craspedocarpa* over *Acacia tetragonophylla*, *Santalum lanceolatum* and *Eremophila longifolia* shrubs, over *Ptilotus obovatus* and *Eremophila* spp. over *Enneapogon caeruleus* and other grasses on flow lines' has been identified as growing in an environment associated with a watercourse (Mattiske Consulting Pty Ltd, 2008; Saracen, 2016; GIS Database). This vegetation community is located around both creeklines.

The major incised creekline is considered a distinctive habitat that provides corridors for movement of fauna across the landscape (Bamford, 2008). The drainage tract also contains seasonal pools which provide an important resource after rainfall for many nomadic and uncommon species, and also provides breeding opportunities for local fauna (Bamford, 2008).

Given this vegetation community is associated with a watercourse, the proposed clearing is at variance to this Principle. Potential impacts to this vegetation community may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

**Methodology** Mattiske Consulting Pty Ltd (2008)  
Saracen (2016)  
GIS Database:  
- Geodata, Lakes  
- 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**

Land System mapping by the Department of Agriculture Western Australia has mapped the proposed clearing area as the Gundockerta Land System, with a small portion within the boundary of the Rainbow Land System (GIS Database).

The Gundockerta Land System is characterised by extensive, gently undulating stony plains supporting bluebush shrublands. Saline plains and adjacent alluvial tracts are susceptible to water erosion where the stony mantle is absent and/or vegetation cover is reduced. The vegetation of this land system is highly

preferred for grazing by introduced and native mammals, rendering it susceptible to overgrazing and consequent degradation (Pringle et al., 1994).

The Rainbow Land System is characterised by hardpan plains supporting Mulga shrublands. Alluvial plains are typically subject to sheet flow and are often characterised by fine ironstone gravel mantles and sparse, generally narrow and unincised concentrated drainage tracts. The Rainbow Land System is generally not susceptible to soil erosion; however impedance of sheet flow can initiate soil erosion and cause water starvation of vegetation downslope (Pringle et al., 1994).

Existing waste rock landforms and an open cut pit are present at the site, which have resulted in permanent changes to the natural landscape (Saracen, 2016). Following the proposed vegetation clearing, further open cut pit development and construction of waste rock landforms is proposed (Saracen, 2016) which will result in further fundamental changes to the natural landscape.

There is a potential for waste rock landforms to erode and impact upon the surrounding landscape if adequate construction and management practices are not implemented, however this is outside the scope of this assessment. Construction and management of waste rock landforms is addressed through the *Mining Act 1978* approval process to ensure that safe, stable and non-erosive landforms are constructed which can be blended into the natural environment.

Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

**Methodology** Pringle et al. (1994)  
Saracen (2016)

GIS Database:  
- Rangelands

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

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

The proposed clearing area is not located within a conservation area (GIS Database). According to available databases, the nearest conservation area is an un-named 'C Class' nature reserve, located approximately 61 kilometres south-south east of the proposed clearing area.

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

**Methodology** GIS Database:  
- DPaW 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 is not likely to be at variance to this Principle**

There are no natural perennial surface water features in the proposed clearing area (GIS Database). An ephemeral drainage line exists between the two existing waste rock landforms, and creeklines are present within the north and south of the application area. These watercourses flow very rarely, with very limited flow duration approximating the length of the storm from which it was generated (Mattiske Consulting Pty Ltd, 2008). Potential impacts to these watercourses may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

The proposed clearing area is not located within a Public Drinking Water Source Area (GIS Database). The Leonora Water Reserve is located approximately 4 kilometres to the north (GIS Database). The groundwater table has been exposed in the existing Kailis Pit, and the water is saline (20,000 - 45,000 mg/L TDS) like much of the groundwater around Leonora (Saracen, 2016; GIS Database). Previous mining activity in the area has not resulted in any significant alteration to groundwater quality. Groundwater levels observed in the monitoring wells surrounding Kailis Pit are generally within 13 metres to 24 metres below top of collar and display a relatively stable trend (Saracen, 2016). Dewatering activities undertaken by the previous operator on site throughout the 2008 mining campaign were observed to produce a 3 metres to 5 metres depression in groundwater levels, which had recovered to post mining levels by 2014. Dewatering is not expected to impact vegetation in the area as rooting depth is unlikely to extend to 18 metres and vegetation is unlikely to be dependent upon saline groundwater (Saracen, 2016).

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

**Methodology** Mattiske Consulting Pty Ltd (2008)  
Saracen (2016)

- GIS Database:
- Groundwater Salinity, Statewide
  - Hydrography, linear
  - Public Drinking Water Source Areas (PDWSAs)

**(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 proposed clearing area is located approximately five kilometres north-west of Leonora (GIS Database). Leonora is located in an arid environment with an average annual rainfall of approximately 236 millimetres (BoM, 2016). Heavy rainfall events are occasionally experienced from remnants of tropical cyclones (Saracen, 2016).

One minor ephemeral drainage line, and two creeklines exist in the proposed clearing area. These watercourses flow very rarely, with very limited flow duration approximating the length of the storm from which it was generated (Saracen, 2016). Previous clearing within the area has also diverted a drainage route into the creekline located in the north of the proposed clearing area. The creekline present in the south-east of the proposed clearing area carries large volumes of water following heavy rainfall events, and ephemeral pools of water are known to persist here for extended periods of time following storm events (Bamford, 2008). Potential impacts upon the natural flow regimes of these watercourses may be minimised by the implementation of a vegetation management condition and a restricted clearing condition.

The proposed clearing of 100 hectares of native vegetation is not expected to increase the incidence or intensity of natural flood events given the area to be cleared (1000 hectares) in relation to the size of the Raeside -Ponton catchment (11,589,532 hectares) (GIS Database).

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

**Methodology** Bamford (2008)  
BoM (2016)  
Saracen (2016)

GIS Database:  
- Hydrographic Catchments - Catchments

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

**Comments**

There are no native title claims over the area under application (DAA, 2015). However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, Department of Parks and Wildlife 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 15 February 2016 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received in relation to this application regarding potential aboriginal heritage issues. According to available datasets, there are no Sites of Aboriginal Significance located in the area applied to clear, with one site directly adjacent to the application area on the eastern border (DAA, 2015). However, heritage surveys may not have been conducted over the application area. It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

**Methodology** DAA (2015)

GIS Database:  
- Aboriginal Sites of Significance

**4. References**

- Bamford Consulting Ecologists (2008) Fauna Assessment of the Kailis Project. Prepared for St Barbara Limited by Bamford Consulting Ecologists, 20 February 2008.
- BoM (2016) Climate Statistics for Australian Locations. A Search for Climate Statistics for Leonora, Australian Government Bureau of Meteorology, <[http://www.bom.gov.au/climate/averages/tables/cw\\_012046.shtml](http://www.bom.gov.au/climate/averages/tables/cw_012046.shtml)> accessed 16 March 2016.
- Cowan, M. (2002) Murchison 1 (MUR1 - East Murchison subregion) in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002'. Department of Conservation and Land Management, Western Australia.
- DAA (2015) Aboriginal Heritage Inquiry System, Government of Western Australia, Department of Aboriginal Affairs, Perth <

<http://maps.dia.wa.gov.au/AHIS2/>> accessed 16 March 2016.

- 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.
- DPaW (2016) NatureMap - Mapping Western Australia Biodiversity, Department of Parks and Wildlife  
<<http://naturemap.dpaw.wa.gov.au/default.aspx>> accessed 16 March 2016
- Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, 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.
- Mattiske Consulting Pty Ltd (2008) Flora and Vegetation Survey of the Kailis - Trump and Poker - Forrest Lease Areas. Prepared for St Barbara Limited by Mattiske Consulting Pty Ltd, March 2008.
- Pringle, H.J., Van Vreeswyk, A.M., & Gilligan, S.A. (1994) Technical Bulletin No. 87: An inventory and condition survey of the north-eastern Goldfields, Western Australia. Department of Agriculture, South Perth, Western Australia.
- Saracen (2016) Kailis Project - Native Vegetation Clearing Permit Application: Clearing Permit Application Supporting Documentation. Report prepared by Saracen Metals Pty Ltd, Western Australia, January 2016.

## 5. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>DAA</b>	Department of Aboriginal Affairs, Western Australia
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia (now DPaW and DER)
<b>DER</b>	Department of Environment Regulation, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia
<b>DRF</b>	Declared Rare Flora
<b>DotE</b>	Department of the Environment, Australian Government
<b>DoW</b>	Department of Water, Western Australia
<b>DPaW</b>	Department of Parks and Wildlife, Western Australia
<b>DSEWPaC</b>	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
<b>EPA</b>	Environmental Protection Authority, Western Australia
<b>EP Act</b>	<i>Environmental Protection Act 1986</i> , Western Australia
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>PEC</b>	Priority Ecological Community, Western Australia
<b>RIWI Act</b>	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
<b>TEC</b>	Threatened Ecological Community



## **Definitions:**

{DPaW (2015) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia):-

- T**                    **Threatened species:**  
Published as Specially Protected under the *Wildlife Conservation Act 1950*, listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).  
**Threatened fauna** is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the Wildlife Conservation Act.  
**Threatened flora** is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the Wildlife Conservation Act.  
The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.
- CR**                    **Critically endangered species**  
Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- EN**                    **Endangered species**  
Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- VU**                    **Vulnerable species**  
Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- EX**                    **Presumed extinct species**  
Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
- IA**                    **Migratory birds protected under an international agreement**  
Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- CD**                    **Conservation dependent fauna**  
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- OS**                    **Other specially protected fauna**  
Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- P**                        **Priority species**  
Species which are poorly known; or  
Species that are adequately known, are rare but not threatened, and require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
- P1**                    **Priority One - Poorly-known species:**  
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey

requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

**P2 Priority Two - Poorly-known species:**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

**P3 Priority Three - Poorly-known species:**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

**P4 Priority Four - Rare, Near Threatened and other species in need of monitoring:**

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.