



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4228/2
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Regis Resources Limited

1.3. Property details

Property: Mining Lease 38/283
Mining Lease 38/292
Mining Lease 38/352
Mining Lease 38/407
Mining Lease 38/802
Mining Lease 38/1249
Mining Lease 38/1250
Mining Lease 38/1251

Local Government Area: Shire of Laverton

Colloquial name: Garden Well Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 24 November 2011

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. One Beard vegetation association has been mapped within the application area (GIS Database; Shepherd, 2009).

18: Low woodland; mulga (*Acacia aneura*).

The majority of the application area was surveyed by staff from Mattiske Consulting (2010) between 19 and 22 October 2010. This survey identified the following eleven vegetation communities as occurring within the application area:

A1: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia ayersiana* over *Acacia ramulosa* var. *linophylla*, *Acacia tetragonophylla*, *Eremophila pungens* (P4), *Eremophila punctata* and *Eremophila forrestii* subsp. *forrestii* on red-orange sandy loams on flats and slopes;

A2: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia ayersiana* and *Grevillea berrynana* over *Acacia ramulosa* var. *ramulos*, *Acacia tetragonophylla* and mixed *Eremophila* spp. over *Ptilotus obovatus*, *Eragrostis eriopoda* and *Eriachne mucronata* on orange sandy/clay-loams on flats;

A3: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana* and occasional *Eucalyptus horistes* over *Acacia oswaldii*, *Acacia victoriae* and *Senna artemisioides* subsp. *filifolia* over *Ptilotus obovatus*, *Triodia scariosa* and *Enneapogon caeruleus* on red-orange sandy-loams with calcrete and quartz pebbles on flats;

A4: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana* and occasional *Eucalyptus horistes* and *Grevillea nematophylla* subsp. *supraplana* over *Acacia tetragonophylla*, *Acacia aptaneura* and *Acacia victoriae* with *Senna artemisioides* subsp. *filifolia* and *Eremophila pungens* (P4) over *Ptilotus obovatus* and mixed Poaceae spp. on orange sandy-loams on flats and minor drainage lines;

A5: Low open woodland to open shrubland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana*, *Acacia burkittii* and *Acacia tetragonophylla* over *Senna artemisioides* subsp. *filifolia* over mixed annual herbs on orange sandy-loams in minor drainage lines;

A6: Low open woodland of *Acacia aneura* var. *aneura* with *Acacia aptaneura*, *Acacia ayersiana* and *Grevillea berryana* over *Eremophila punctata* and *Eremophila latrobei* subsp. *latrobei* over *Eriachne mucronata* on orange sandy-loams with numerous chert outcropping on slopes and ridges;

A7: Low open woodland of *Acacia aneura* var. *aneura* over *Acacia craspedocarpa*, *Acacia tetragonophylla*, *Santalum spicatum*, *Eremophila georgei* and *Senna artemisioides* subsp. *filifolia* over *Sida calyxhymenia*, *Ptilotus obovatus* and *Eriachne mucronata* on orange sandy loams in minor drainage lines;

A8: Low open woodland to open shrubland of *Acacia ayersiana*, *Acacia aneura* var. *aneura* and *Acacia aptaneura* with *Acacia tetragonophylla* over *Eremophila latrobei* subsp. *filiformis*, *Ptilotus obovatus*, *Dianella revoluta* and *Eragrostis eriopoda* on orange sandy-loams on flats;

A9: Low open woodland of *Acacia aneura* var. *aneura* and *Acacia ayersiana* with occasional *Grevillea berryana* over *Acacia tetragonophylla*, *Acacia craspedocarpa* and *Eremophila pungens* (P4) over *Ptilotus obovatus*, *Sida calyxhymenia* and Poaceae spp. on orange sandy-loams on flats;

A10: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with occasional *Eucalyptus horistes*, *Grevillea berryana* and *Hakea lorea* over *Acacia burkittii* and *Acacia tetragonophylla* over *Senna artemisioides* subsp. x *artemisioides* and *Senna artemisioides* subsp. *filifolia* over *Ptilotus obovatus*, *Sida calyxhymenia* and Poaceae spp. on orange sandy/clay-loams in drainage lines; and

C1: Low open Chenopod shrubland of *Maireana pyramidata* and *Cratystylis subspinescens* with emergent *Acacia aneura* var. *aneura* and *Hakea preissii* over *Frankenia setosa*, *Maireana georgei*, *Maireana planifolia*, *Maireana tomentosa* and *Sclerolaena eriacantha* on orange clay-loams on flats.

Clearing Description	Regis Resources Limited has applied to clear up to 960 hectares of native vegetation within a boundary of 1,870 hectares for the purpose of mineral production. The proposed clearing will enable the development of the Garden Well Project area including the proposed Garden Well open pit, tailings storage facility, waste rock dumps, ROM pad, processing plant, accommodation village, safety bunding, access roads and associated mine infrastructure (Regis Resources, 2011).
Vegetation Condition	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994); To Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).
Comment	The application area is located in the Murchison region of Western Australia and is situated approximately 73 kilometres north of Laverton (GIS Database).

Clearing permit CPS 4228/1 was granted by the Department of Mines and Petroleum on 7 April 2011, and was valid from 30 April 2011 to 31 July 2016. The clearing permit authorised the clearing of 960 hectares of native vegetation. An application for an amendment to clearing permit CPS 4228/1 was submitted by Regis Resources Limited on 15 September 2011. The proponent requested a change to the reporting date for the clearing permit from 31 July each year to 31 March each year. There were no additional environmental impacts as a result of this amendment.

3. Assessment of application against clearing principles

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

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

The application area is located within the East Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion which encompasses an area of 28,120,558 hectares (GIS Database; Shepherd, 2009). The East Murchison subregion is characterised by internal drainage, extensive areas of elevated red desert sandplains with minimal dune development, salt lake systems associated with the occluded paleodrainage system, broad plains of red-brown soils and breakaway complexes, as well as red sandplains (CALM, 2002). Vegetation is dominated by Mulga woodlands which are often rich in ephemerals; hummock grasslands, saltbush shrublands and *Halosarcia* shrublands (CALM, 2002).

The vegetation within the application areas consists of Beard vegetation association 18 which is common and widespread throughout the Pilbara region, with approximately 100% of the pre-European vegetation extent remaining (Shepherd, 2009; GIS Database).

A vegetation survey conducted by Mattiske Consulting (2010) over the majority of the application area in

October 2010 identified eleven vegetation associations. Aerial photography and ground surveys determined that the vegetation within and surrounding the area under application is typical of the vegetation throughout the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (Mattiske Consulting, 2010). It is therefore considered unlikely that the vegetation within the application area holds greater biodiversity than that of the surrounding areas.

A total of 125 vascular plant taxa from 63 genera and 29 families were recorded within the Garden Well application area (Mattiske Consulting, 2010). Using a species accumulation curve, Mattiske Consulting (2010) predict that approximately 170 taxa are likely to occur within the surveyed area. This is similar to the number of species recorded in the Moolart Well, Dogbolter and Eristoun Gold Projects clearing permit application area (174) (Outback Ecology Services, 2007).

Two Priority 4 flora species (*Baeckea* sp. Melita Station and *Eremophila pungens*) were recorded within the application area (Mattiske Consulting, 2010).

Baeckea sp. Melita Station occurs in a variety of vegetation associations, has a broad distribution and has a high number of both populations and individuals (Regis Resources, 2011). Between 62 and 125 individual plants are likely to be removed by the proposed clearing (Regis Resources, 2011). This species has previously been recorded in the surrounding area and any unnecessary clearing of Priority taxa within the project area will be avoided (Regis Resources, 2011). Given the small number of species likely to be impacted by this proposed clearing, it is considered unlikely that the proposed clearing will impact upon the conservation status of this species.

Eremophila pungens was identified at 32 floristic sites across 8 vegetation associations within the broader Garden Well application area (Regis Resources, 2011). Between 501 and 997 individual plants of this taxa were recorded during a vegetation survey of the application area carried out by Mattiske Consulting (2010). Of this between 218 and 450 individual plants may be removed by the proposed clearing (Regis Resources, 2011). The number of individual plants for this species, in the area surrounding the application area, is estimated to be in the thousands (Regis Resources, 2011). Given the large number of populations and individuals outside of the application area, as well as the variety of vegetation associations it occurs in, it is considered unlikely that the proposed clearing will impact upon the conservation status of this species (Regis Resources, 2011).

A Level 2 fauna assessment for the Garden Well Project area was undertaken by Terrestrial Ecosystems (2010) from 7 to 14 December. The desktop survey undertaken as part of the fauna assessment identified fourteen conservation significant fauna species that are present in the areas surrounding the application area (Terrestrial Ecosystems, 2010). Based on preferred habitats, Terrestrial Ecosystems (2010) have identified six of these species that may potentially occur within the application area:

- Peregrine Falcon (*Falco peregrines*) – Schedule 4, *Wildlife Conservation Act 1950*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species;
- Australian Bustard (*Ardeotis australis*) – Priority 4, *Wildlife Conservation Act 1950*: Present in the local area, but will move when vegetation is cleared;
- Slender-billed Thornbill (western) (*Acanthiza iredalei iredalei*) – Vulnerable, *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species;
- Princess Parrot (*Polytelis alexandrae*) – Vulnerable, *EPBC Act 1999*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species;
- Rainbow Bee-eater (*Merops ornatus*) – Migratory, *EPBC Act 1999*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species; and
- Fork-tailed Swift (*Apus pacificus*) – Migratory, *EPBC Act 1999*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species (Terrestrial Ecosystems, 2010).

None of these species were recorded during the fauna survey conducted by Terrestrial Ecosystems (2010).

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

Methodology

CALM (202)
Mattiske Consulting (2010)
Outback Ecology Services (2007)
Regis Resources (2011)
Shepherd (2009)
Terrestrial Ecosystems (2010)
GIS database:
- IBRA WA (regions – subregions)
- Pre-European Vegetation

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

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

A Level 2 fauna assessment for the Garden Well Project Area was undertaken by Terrestrial Ecosystems (2010). The desktop survey undertaken as part of the fauna assessment identified fourteen conservation significant fauna species that are present in the areas surrounding the application area (Terrestrial Ecosystems, 2010). Based on preferred habitats, Terrestrial Ecosystems (2010) have identified six of these species that may potentially occur within the application area:

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- Princess Parrot (*Polytelis alexandrae*) – Vulnerable, *EPBC Act 1999*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species;
- Rainbow Bee-eater (*Merops ornatus*) – Migratory, *EPBC Act 1999*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species; and
- Fork-tailed Swift (*Apus pacificus*) – Migratory, *EPBC Act 1999*: May infrequently be seen in the area, clearing vegetation is unlikely to impact on this species (Terrestrial Ecosystems, 2010).

None of these species were recorded during the fauna survey conducted by Terrestrial Ecosystems (2010) from 7 to 14 December 2010.

The fauna habitat at the Garden Well project area is open mulga woodland over mixed scattered shrubs with the density of trees and shrubs varying considerably across the site (Terrestrial Ecosystems, 2010). Aerial photography and ground surveys conducted by Matiske Consulting (2010) determined that the vegetation within the application area is typical of the vegetation throughout the region and as such is well represented outside of the proposal area. It is therefore considered unlikely that the proposed clearing will significantly impact significant habitat for fauna indigenous to Western Australia.

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

Methodology Matiske Consulting (2010)
Terrestrial Ecosystems (2010)

(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

According to available GIS Databases there are no known records of Declared Rare Flora (DRF) within the application area (GIS Database).

No DRF taxa were recorded during a vegetation survey conducted in October 2010 by Matiske Consulting (2010).

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

Methodology Matiske Consulting (2010)
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

According to available GIS Databases there are no known records of Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is located approximately 212 kilometres west of the application area (GIS Database). At this distance, there is little likelihood of any impact to the TEC as a result of the proposed clearing.

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

Methodology 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 located within the Murchison bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). Shepherd (2009) reports that approximately 100% of the pre-European vegetation remains in the Murchison bioregion.

The vegetation in the application area is broadly mapped as Beard vegetation association:

18: Low woodland; mulga (*Acacia aneura*).

According to Shepherd (2009) approximately 100% of this Beard association remains within the Murchison bioregion (see table on next page).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Murchison	28,120,587	28,120,587	~100	Least Concern	~1.06
Beard vegetation associations - State					
18	19,892,305	19,890,275	~99.99	Least Concern	~2.13
Beard vegetation associations - Bioregion					
18	12,403,172	12,403,172	~100	Least Concern	~0.37

* Shepherd (2009)

** Department of Natural Resources and Environment (2002)

The vegetation under application is not a remnant of vegetation in an area that has been extensively cleared.

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
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

According to available GIS Databases, there are no permanent wetlands or watercourses within the application area, however there are several minor ephemeral watercourses within the application area (GIS Database).

Mattiske Consulting (2010) report that a major creekline/drainage system intersects the southern end of the application area. Three of the eleven vegetation communities defined by Mattiske Consulting (2010) within the application area are associated with this creekline/drainage system:

A4: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana* and occasional *Eucalyptus horistes* and *Grevillea nematophylla* subsp. *supraplana* over *Acacia tetragonophylla*, *Acacia aptaneura* and *Acacia victoriae* with *Senna artemisioides* subsp. *filifolia* and *Eremophila pungens* (P4) over *Ptilotus obovatus* and mixed Poaceae spp. on orange sandy-loams on flats and minor drainage lines;

A5: Low open woodland to open shrubland of *Acacia aneura* and *Acacia aneura* var. *aneura* with *Acacia ayersiana*, *Acacia burkittii* and *Acacia tetragonophylla* over *Senna artemisioides* subsp. *filifolia* over mixed annual herbs on orange sandy-loams in minor drainage lines; and

A10: Low open woodland of *Acacia aneura* and *Acacia aneura* var. *aneura* with occasional *Eucalyptus horistes*, *Grevillea berryana* and *Hakea lorea* over *Acacia burkittii* and *Acacia tetragonophylla* over *Senna artemisioides* subsp. *x artemisioides* and *Senna artemisioides* subsp. *filifolia* over *Ptilotus obovatus*, *Sida calyxhymenia* and Poaceae spp. on orange sandy/clay-loams in drainage lines (Mattiske Consulting, 2010).

The assessing officer notes that vegetation mapping by Mattiske Consulting (2010) shows vegetation communities A5 and A10 as occurring in association with the flowlines, while vegetation community A4 is

associated with the accompanying floodplains.

One of the eleven vegetation communities defined by Matiske Consulting (2010) is associated with minor drainage lines throughout the application area:

A7: Low open woodland of *Acacia aneura* var. *aneura* over *Acacia craspedocarpa*, *Acacia tetragonophylla*, *Santalum spicatum*, *Eremophila georgei* and *Senna artemisioides* subsp. *filifolia* over *Sida calyxhymentia*, *Ptilotus obovatus* and *Eriachne mucronata* on orange sandy loams in minor drainage lines.

The assessing officer notes that all of the drainage lines are considered common drainage features throughout the Murchison Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. Additionally, the vegetation associated with these drainage lines (Mulga woodlands) is common throughout the Murchison IBRA bioregion.

Based on the above, the proposed clearing is at variance to this Principle. However, given the broad extent of the watercourses and the associated vegetation throughout the Murchison IBRA bioregion, it is not likely that the proposed clearing will impact upon any significant wetland, watercourse or drainage feature in the local area.

Methodology Matiske Consulting (2010)
GIS Database:
- Hydrography, linear
- IBRA WA (regions – subregions)

(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**

Regis Resources has applied to clear up to 960 hectares within an application area totalling approximately 1,870 hectares (Regis Resources, 2011). The Environmental Protection Authority Guidance Statement Number 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2004) sets out criteria in order to determine the size, scale and impact of development proposals. Based on the criteria set out within this document (EPA, 2004), the proposed clearing for the purpose of mineral production is considered high impact.

According to the Department of Agriculture's Technical Bulletin No. 87 "An inventory and condition survey of the north-eastern Goldfields, Western Australia", the application area is characterised by the Ararak, Bevon, Brooking, Cunyu, Hootanui, Jundee, Steer and Violet Land Systems (Pringle et al., 1994).

- The Ararak Land System is characterised by broad plains with mantles of ironstone gravel supporting mulga shrublands with wanderrie grasses (Pringle et al., 1994). The land system comprises of extensive level to gently undulating plains subject to very diffuse sheet flow, more concentrated flow zones, isolated rises within Limonite (<5 metre relief) and higher plains with pebble mantles (Pringle et al., 1994). As a result of the low slopes, protective soil mantles and very diffuse sheet flow, this land system is generally not susceptible to soil erosion, although it is considered mildly susceptible to water starvation problems (Pringle et al., 1994). Although the Ararak Land System comprises of protective soil materials that are resilient to erosion, it is considered that the clearing of native vegetation and the disturbance of the protective surface mantles has the potential to increase the risk of soil erosion.
- The Bevon Land System is characterised by irregular low ironstone hills with stony lower slopes supporting mulga shrublands (Pringle et al., 1994). The land system comprises of irregular low hills capped with limonite, plateaux, and small breakaways with short footslopes, extensive lower colluvial, very gently inclined plains with mantles of ferruginous gravel and narrow drainage tracts (Pringle et al., 1994). Minor areas with texture contrast soils on breakaway footslopes and narrow drainage tracts are susceptible to soil erosion, particularly if perennial shrub cover is substantially reduced or the soil surface is disturbed (Pringle et al., 1994). This land system only accounts for approximately 4.8 hectares of the 1,870 hectares in the application area.
- The Brooking Land System is characterised by prominent ridges of banded iron formation, supporting mulga shrublands; occasional minor halophytic communities in the south-east (Pringle et al., 1994). The land system comprises of linear ridges to 8 kilometres long and occasionally greater than 60 metres relief, generally much lower; gently inclined slopes with colluvium and sparse, often incised, narrow drainage tracts (Pringle et al., 1994). The stone mantles of this land system provide effective protection against soil erosion and it is considered likely that the removal of stone mantles may initiate soil erosion (Pringle et al., 1994).
- The Cunyu Land System is characterised by calcrete platforms and intervening alluvial floors and minor areas of alluvial plains with acacia shrublands and minor halophytic shrublands (Pringle et al., 1994). The land system comprises of calcrete valley fills up to 9 kilometres wide; calcrete platforms and intervening drainage floors and broader alluvial plains, also minor plains with mantles of calcrete rubble and occasional drainage foci (Pringle et al., 1994). The alluvial plains and drainage lines of this land system are mildly susceptible to water erosion if perennial shrub cover is substantially reduced or the soil surface is disturbed (Pringle et al., 1994).
- The Hootanui Land System is characterised by breakaways, hills and ridges with extensive saline gravelly

and stony lower plains, supporting scattered halophytic low shrublands (Pringle et al., 1994). Narrow drainage tracts and breakaway footslopes are susceptible to water erosion in areas where perennial shrub cover is substantially reduced or if the soil surface is disturbed (Pringle et al., 1994). The vegetation units identified within these land units occur on depositional plains characterised by shallow red earths and red sandy soils, and frequently with surface layer of quartz stones (Outback Ecology Services, 2007). These areas are generally very gently inclined to level plains which are subject to sheet flow (Pringle et al., 1994). It is considered that there is a moderate risk of water erosion in areas where native vegetation is cleared and where surface mantles are disturbed.

- The Jundee Land System is characterised by hardpan plains with ironstone gravel mantles, supporting mulga shrublands (Pringle et al., 1994). The land system comprises of gently inclined to level plains with mantles of fine ironstone gravel, subject to sheet flow, also sparse tracts receiving more concentrated run-on, and occasional irregular low sandy tracts and banks (Pringle et al., 1994). Impedance to natural sheet flows can initiate soil erosion and cause water starvation and consequent loss of vigour in vegetation downslope (Pringle et al., 1994). While Pringle et al. (1994) suggests that gravel mantles within this land system provide effective protection against soil erosion, it is considered that the disturbance of the protective surface mantles has the potential to increase the risk of soil erosion.

- The Steer Land System is characterised by gravelly alluvial plains with halophytic shrublands (Pringle et al., 1994). This land system is generally not susceptible to erosion, partly due to protective stone and gravel mantles (Pringle et al., 1994). However, unprotected areas on alluvial plains, and more particularly drainage floors, are susceptible to water erosion (Pringle et al., 1994). The proposed clearing of native vegetation for mineral production is likely to cause significant disturbance to the surface mantles which would usually provide protection against soil erosion. It is considered that the proposed clearing of native vegetation within the drainage line and adjoining 'alluvial plains', 'saline alluvial plains' and 'stony plains' land system units is likely to increase the possibility for water erosion to occur.

- The Violet Land System is characterised by extensive, gently undulating to level plains and low rises with mantles of ironstone pebbles and level to very gently inclined plains subject to sheet flow within mantles of fine ironstone gravel (Pringle et al., 1994). Abundant mantles provide effective protection against soil erosion over most of the land system, except where the soil surface has been disturbed in which case the soil becomes moderately susceptible to water erosion (Pringle et al., 1994). Narrow drainage tracts are mildly susceptible to water erosion (Pringle et al., 1994). Most of the land within the areas characterised by the Violet Land System comprise of surface mantles which are resilient to soil erosion. The proposed clearing of native vegetation for mineral production will cause a significant disturbance to the surface mantles which usually would provide protection against soil erosion. As a result, there is considered to be a moderate risk of soil erosion in areas where clearing occurs.

In order to reduce the likelihood of land degradation, Regis Resources (2011) plan to implement a number of management procedures in order to meet the following management objectives:

- To avoid the clearing of native vegetation wherever possible;
- To limit the amount of vegetation cleared;
- To undertake project activities in a manner that minimises adverse impact to vegetation communities;
- To conserve and re-use cleared vegetation and stripped topsoil (which contains seeds, nutrients, organic matter and micro-organisms) in site rehabilitation;
- To encourage the re-establishment of self sustaining ecosystems compatible with surrounding undisturbed area;
- To meet all legislative requirements relating to the rehabilitation of disturbed areas to liaise closely with the Government bodies to ensure compliance (Regis Resources, 2011).

Based on the above, the proposed clearing may be at variance to this Principle. However, with the implementation of the proposed management procedures, it is likely that the management objectives will be achieved therefore reducing the potential for land degradation. The implementation of a staged clearing condition should also reduce the length of time the surface is left bare and uncompacted, therefore reducing the likelihood of erosion.

Methodology EPA (2004)
Outback Ecology Services (2007)
Pringle et al. (1994)
Regis Resources (2011)

(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 is not located within a conservation area (GIS Database). The nearest known conservation reserve is De La Poer Range Nature Reserve which is situated approximately 43 kilometres north east of the application area at its closest point (GIS Database). At this distance the proposed clearing is not likely to impact on the environmental values of this conservation area.

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

Methodology GIS Database:
- DEC Tenure

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

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

The application area experiences an arid climate with an average annual rainfall of approximately 276.9 millimetres and experiences mean annual evaporation of approximately 3,400 millimetres (CALM, 2002; BoM, 2011; GIS Database). While there are several minor ephemeral watercourses and wash areas within the application area, the sporadic nature of the rainfall within the local area means that water only holds for a short period of time. As there are no permanent or semi-permanent surface water features within the vicinity of the application area, the proposed clearing activities are not likely to cause deterioration in the quality of surface water.

Groundwater within the application area has moderate salinity levels of between 1,000 to 3,000 milligrams per litre Total Dissolved Solids (TDS) (GIS Database). Salinity within this range is classed as Brackish and considered acceptable for most stock and some irrigation.

According to available GIS Databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Laverton Water Reserve which is located approximately 50 kilometres south of the application area at its closest point (GIS Database). Given the distance separating the application area and the nearest water supply, the proposed clearing is not likely to impact on the water quality of the Laverton Water Reserve.

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

Methodology BoM (2011)
CALM (2002)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- 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 application area experiences an arid climate with an average annual rainfall of approximately 276.9 millimetres recorded at Laverton Aero weather station, approximately 73 kilometres south of the application area (CALM, 2002; BoM, 2011). Mean annual evaporation rates in the application area are approximately 3,400 millimetres (GIS Database). Given these climate conditions, surface water is unlikely to persist in the proposed clearing area for extended periods of time.

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

Methodology BoM (2011)
CALM (2002)
GIS Database:
- Evaporation Isopleths

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

Comments

There are no Native Title Claims over the area under application (GIS Database). 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*.

There are no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged 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.

Clearing permit CPS 4228/1 was granted by the Department of Mines and Petroleum on 7 April 2011, and was

valid from 30 April 2011 to 31 July 2016. The clearing permit authorised the clearing of 960 hectares of native vegetation. An application for an amendment to clearing permit CPS 4228/1 was submitted by Regis Resources Limited on 15 September 2011. The proponent requested a change to the reporting date for the clearing permit from 31 July each year to 31 March each year. There were no additional environmental impacts as a result of this amendment.

Methodology GIS Database:
 - Aboriginal Sites of Significance
 - Native Title – Registered with the NNTT

4. References

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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.