



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5188/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Minjar Gold Pty Ltd

1.3. Property details

Property: Mining Lease 59/219
Mining Lease 59/421
Mining Lease 59/458
Local Government Area: Shire of Yalgoo
Colloquial name: Minjar Gold Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
119		Mechanical Removal	Mineral Production and Associated Activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 20 December 2012

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 and are useful to look at vegetation in a regional context. The following Beard vegetation associations are located within the application area (GIS Database):

202: Shrublands; mulga and *Acacia quadrimarginea* scrub;
352: Medium woodland; York gum; and
420: Shrublands; bowgada and jam scrub.

Animal Plant Mineral (APM) conducted flora and vegetation assessments over the application area from 7 to 18 November 2011 and 12 to 14 October 2012 (APM, 2011, APM, 2012a). The majority of the assessment was undertaken as part of a larger flora and vegetation assessment over five project areas including Austin, Windinne Well, Silverstone, Bugeye and Highland Chief. Vegetation mapping was sourced from three previous Mattiske Consulting Pty Ltd (Mattiske) surveys which covered the majority of the application area and were undertaken in 2009. This mapping was verified by APM (2011, 2012a) and extended to include the entire application area. According to APM (2012b), the following 16 vegetation communities occur within the application area.

Windinne Well

Acacia Shrublands

1. A9: Tall shrubland of *Acacia ayersiana*, *Acacia ramulosa* var. *ramulosa*, *Acacia aneura* with *Acacia sibina* and *Grevillea obliquistigma* subsp. *obliquistigma* over *Drummondita fulva* (Priority 3), *Eremophila latrobei* subsp. *latrobei* and *Aluta aspera* subsp. *hesperia* with low shrubs over annuals on orange brown sandy loam with rock cover on slopes and ridges.

2. A22: Tall Open Shrubland of *Acacia assimilis* subsp. *assimilis* and *Acacia ramulosa* var. *ramulosa* over *Philotheca brucei* subsp. *brucei* and *Eremophila shonae* subsp. *shonae* with *Micromyrtus trudgenii* (Priority 3) and *Drummondita fulva* (Priority 3) over annuals on orange-brown rocky shale and quartz upper-slopes and ridges.

3. A23: Tall Open Shrubland of *Acacia ayersiana* over *Thryptomene decussata* and mixed *Acacia* spp. with *Grevillea obliquistigma* subsp. *obliquistigma* over *Hibbertia arcuata* and mixed low shrubs over annuals on rocky orange-brown sandy loam on mid to upper-slopes.

Shrublands

4. S12: Open Shrubland of *Baeckea benthamii* (ms), *Aluta aspera* subsp. *hesperia* and *Thryptomene* spp. over *Eremophila* spp. and mixed low shrubs over annuals, with occasional emergent *Acacia ayersiana* and *Acacia ramulosa* var. *ramulosa* on orange-brown rocky upper-slopes and ridges with occasional exposed Banded Ironstone outcrops.

Silverstone

Woodlands

5. E5: Low open woodland of *Eucalyptus horistes* over *Acacia ayersiana*, *Acacia effusifolia* and *Acacia sibina* with *Melaleuca nematophylla*, *Melaleuca laterifolia* subsp. *acutifolia* and *Hakea recurva* over mixed low shrubs and annuals on orange brown clay flats.

6. E6: Open woodland of *Eucalyptus horistes* and *Callitris columellaris* over *Acacia ramulosa* var. *ramulosa* and *Acacia tetragonophylla* over *Ptilotus* spp. and mixed low shrubs over chenopods and annuals on orange-red sandy loam on flats.

7. C1: Low Open Woodland of *Callitris columellaris* over *Acacia ramulosa* var. *ramulosa* and *Melaleuca lateriflora* subsp. *acutifolia* with *Acacia sibina* and *Grevillea obliquistigma* subsp. *obliquistigma* over *Hibbertia arcuata*, *Eremophila clarkei* and *Aluta aspera* subsp. *hesperia* over mixed low shrubs and annuals on deep orange brown sandy loams on flats.

Acacia Shrublands

8. A1: Tall Open Scrub of *Acacia ramulosa* var. *ramulosa* with *Acacia sibina* over *Eremophila forrestii* and mixed low shrubs over *Cheilanthes adiantoides* and annuals on orange sandy loams on lower slopes and flats.

9. A2: Tall Shrubland of *Acacia ramulosa* var. *ramulosa* with *Acacia ayersiana* and *Acacia sibina* over *Eremophila forrestii* and *Philotheca deserti* subsp. *deserti* with *Aluta aspera* subsp. *hesperia* over *Cheilanthes adiantoides*, *Monachather paradoxus*, low shrubs and annuals on orange brown sandy loam on flats.

10. A3: Tall Shrubland of *Acacia ramulosa* var. *ramulosa* with *Hakea recurva* subsp. *recurva*, *Acacia sibina*, *Acacia ayersiana* and *Acacia tetragonophylla* over mixed low shrubs and annuals on orange brown sandy loam on flats.

11. A4: Tall Open Shrubland of *Acacia ayersiana* with *Acacia ramulosa* var. *ramulosa* and *Acacia aneura* over *Acacia sibina* and *Eremophila forrestii* over low shrubs and annuals on orange sandy loam on flats.

12. A5: Tall Shrubland of *Acacia ramulosa* var. *ramulosa* over *Aluta aspera* subsp. *hesperia* with *Baeckea ?benthamii* (ms) and *Hibbertia stenophylla* over annuals on orange brown sandy loam on flats.

13. A15: Tall shrubland of *Acacia ayersiana* and *Acacia ramulosa* var. *ramulosa* with *Hakea recurva* and over *Ptilotus drummondii* var. *drummondii*, *Ptilotus obovatus* and *Scaevola spinescens* over chenopods and annuals with occasional emergent *Callitris columellaris* on orange-brown clayey loam on flats.

14. A16: Tall open shrubland of *Acacia ramulosa* var. *ramulosa* with *Acacia tetragonophylla* and *Hakea recurva* over *Eremophila decipiens* subsp. *decipiens*, *Ptilotus* spp. and mixed low shrubs over chenopods and annuals on slightly rocky sandy-loam flats.

Low Shrublands

15. S1: Low Open Shrubland of *Stachystemon intricatus* and *Mirbelia rhagodioides* with *Aluta aspera* subsp. *hesperia* with emergent *Acacia ayersiana*, *Acacia burkittii*, *Acacia ramulosa* var. *ramulosa*, *Eremophila forrestii* and *Acacia sibina* on orange brown sandy loam on flats.

16. S2: Low Shrubland of *Aluta aspera* subsp. *hesperia* and *Thryptomene costata* with mixed low shrubs and annuals on orange brown sandy loam with rock cover on lower slopes.

Clearing Description

Minjar Gold Pty Ltd has applied to clear 119 hectares within an application area of approximately 360 hectares (GIS Database). The application area is located approximately 65 kilometres south, south east of Yalgoo (GIS Database).

The application area consists of two separate areas, comprising Windinne Well and Silverstone (approximately two kilometres apart). The purpose of the application is to redevelop the Windinne Well and Silverstone mines. For both areas this includes pit expansion, enlarging the waste rock dump and construction of a temporary run of mine pad (APM, 2012b). The proposed clearing is for approximately 24 hectares at Windinne Well and approximately 95 hectares at Silverstone. Clearing will be by mechanical means. Vegetation and topsoil will be stockpiled for use in rehabilitation (APM, 2012b).

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);

to

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

Previous mining operations have occurred at Windinne Well and Silverstone with historic pits, waste rock dumps and roads present in both areas (APM, 2012b). Drill lines are also present at Silverstone. Previous clearing includes approximately 30.7 hectares at Windinne Well and approximately 96 hectares at Silverstone (APM, 2012b).

APM (2012b) also notes impacts from historic grazing and current grazing by feral goats.

A Level 1 fauna survey was also conducted in association with the 2009 Mattiske flora and vegetation surveys of the Monaco, Bugeye, Eastern Creek, Austin, Keronima, Silverstone and Windinne Well project areas. This was undertaken by Aquila Wildlife Fieldwork with site reconnaissance undertaken in July 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 may be at variance to this Principle**

The application area is located within the Talling subregion of the Yalgoo Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). At a broad scale, vegetation can be described as low woodlands to open woodlands of *Eucalyptus*, *Acacia* and *Callitris* on red sandy plains of the Western Yilgarn Craton and southern Carnarvon Basin (CALM, 2002). The subregion is particularly rich in ephemerals (CALM, 2002).

Several vegetation surveys have previously been conducted over the application area and Minjar Gold tenements. APM reviewed these and utilised the most recent surveys applicable to the application area as a basis for flora information and vegetation mapping. These surveys were undertaken by Mattiske in July and November 2009 and included the Windinne Well (Mattiske, 2009c), Eastern Creek (Mattiske, 2009a) and Silverstone (Mattiske, 2009b) flora and vegetation surveys. Based on the APM and Mattiske surveys four vegetation communities occur at Windinne Well and 12 vegetation communities occur at Silverstone. According to Mattiske (2009a, 2009b, 2009c), vegetation communities A1, A2, A9, A15, A22, A23, S1, S12 and E5 may be considered locally significant as they support Priority Flora species. APM (2012a) states that the vegetation communities are broadly represented across Minjar's tenements.

The Mattiske surveys recorded a total of 32 families, 48 genera and 75 species at Windinne Well (Mattiske, 2009c) and a total of 47 families, 82 genera and 133 species at Silverstone (Mattiske, 2009a, 2009b). A total of 11 invasive weed species have been identified during previous surveys (APM, 2012b). Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

No Threatened Flora or Threatened Ecological Communities have been recorded within the application area (GIS Database; APM, 2012a, 2012b).

The application area is located within the Priority 1 Minjar vegetation complexes (banded ironstone formation (BIF)) Priority Ecological Communities (PECs) and is approximately 12 kilometres from the Priority 1 Warriedar Hill/Pinyalling vegetation complexes (BIF) PEC. These PECs consist of vegetation units associated with BIF and BIF outwash geology of the BIF range and often include endemic vegetation units (DEC, 2012a). According to APM (2012a), the only banded ironstone present within the application area occurs in the north east corner of Windinne Well. This outcropping is less than one hectare in area and was identified by Mattiske in vegetation community S12. This area was surveyed by APM in the 2011 and 2012 surveys and was not considered to consist of Minjar/Gnows Nest PEC (APM, 2012a). However, Mattiske (2009c) considered vegetation community S12 to have similarities to Markey and Dillon's (2008) floristic community type 1a which was identified on small massive outcrops of BIF on low rises during a survey of several banded ironstone ranges and outcrops within the Yalgoo bioregion in 2005. Mattiske (2009c) also considered vegetation community A22 as containing characteristic species of Markey and Dillon's (2008) floristic community type 3 which occurred on rocky outcrops of banded ironstone and sedimentary chert. Based on this, DEC (2012a) considered vegetation communities S12 and A22 as likely to align with Markey and Dillon's (2008) floristic community types 1a and 3, respectively. Mattiske (2009c) recommended minimising impacts to the rocky outcrops of A22 and occasional exposed banded ironstone of community S12 where possible. According to APM (2012a), approximately 3.44 hectares of S12 and 6.53 hectares of A22 occurs at Windinne Well with the proposed clearing impacting on 0.67 hectares of S12 (19.5%) and 1.89 hectares of A22 (28.9%). APM (2012b) states the proposed clearing will not impact on the banded ironstone outcropping at Windinne Well. Potential impacts to the banded ironstone outcropping and S12 may be minimised by the implementation of a vegetation management condition.

Four Priority 3 Flora species were recorded within the application area during the current surveys (APM, 2012a, 2012b). These species were *Mircomyrtus trudgenii*, *Drummondita fulva*, *Grevillea globosa* and *Persoonia pentasticha*.

Population sizes of *Mircomyrtus trudgenii* were estimated at 886+ individuals at Windinne Well and 15 individuals at Silverstone (APM, 2012a, 2012b). *Drummondita fulva* was only recorded at Windinne Well and was estimated at 1,014 individuals (APM, 2012a, 2012b). At Windinne Well *Mircomyrtus trudgenii* and *Drummondita fulva* commonly occurred together and as a dominant understorey component on rocky rises in vegetation communities A9 and A22, but were also present in S12 (APM, 2012b). These species have also been recorded at the Austin and Bugeye tenements and are likely to be locally abundant on the rocky, skeletal rises of the area, where they have been recorded multiple times in prior surveys (APM, 2012b). On a regional level these species are limited to the Talling IBRA subregion with *Mircomyrtus trudgenii* known from 29 records and *Drummondita fulva* known from 15 records (Western Australian Herbarium, 2012). The proposed clearing is expected to impact 61 *Mircomyrtus trudgenii* individuals or 6.9% of the population at Windinne Well and 5 individuals or 33% of the population at Silverstone. For *Drummondita fulva* the proposed clearing is expected to impact 198 individuals or 19.5% of the population (APM, 2012a, 2012b). Although regionally restricted, the proposed impacts to these species are unlikely to have a significant impact on their conservation status.

Grevillea globosa and *Persoonia pentasticha* were recorded at Silverstone with an estimated population of 237+ individuals and 1 individual, respectively (APM, 2012a, 2012b). *Grevillea globosa* occurred within

vegetation communities E5 and A15 at multiple locations from scattered isolated small groups to a major understorey component. This species was also recorded at Austin and is known from 23 records occurring within the Yalgoo and Avon Wheatbelt bioregions (APM, 2012b, Western Australian Herbarium, 2012). *Persoonia pentasticha* is known from 41 records occurring within the Yalgoo, Geraldton Sandplains and Avon Wheatbelt bioregions. The proposed clearing is expected to impact 39 individuals or 16.5% of the *Grevillea globosa* population and the 1 individual *Persoonia pentasticha* recorded (APM, 2012a, 2012b). Based on the above, the proposed clearing is unlikely to significantly impact these species.

Available databases show one Priority 1 species, *Chamelaucium* sp. Yalgoo, has been recorded within the application area (GIS Database, DEC 2012a). This is located in the south east portion of Silverstone. Despite searching for this species, APM (2012a) could not relocate this record and considered it likely that the specimen (recorded opportunistically outside of the formal survey area by Mattiske) was misidentified.

Other Priority Flora species recorded within the application area during previous flora surveys includes *Micromyrtus mucronulata* (Priority 1) and *Gunniopsis rubra* (Priority 3). APM (2012a) did not detect *Micromyrtus mucronulata* and speculate that the previous records are likely to have been cleared (close to the Windinne Well open pit) and the other records on 'more remote hill tops' occur outside the application area. Up to 200 individuals of *Gunniopsis rubra* were previously recorded and could be impacted by the proposed clearing, however, this species was not found in the recorded locality despite extensive searching and a high and late rainfall year in 2011 (APM, 2012a). This species is known from 24 records occurring within the Yalgoo, Coolgardie and Avon Wheatbelt bioregions (Western Australian Herbarium, 2012).

According to APM (2012b), database searches identified eight mammal, 114 bird, three amphibian and 34 reptile species that have been recorded within a 40 kilometre radius of the Bugeye area (middle of the Minjar prospects). APM (2012b) notes there are four broad fauna habitat types within the application area including *Eucalyptus* woodlands, *Callitris* woodlands, *Acacia* shrublands and Mixed shrublands. Given the surrounding area is largely uncleared and the historical mining disturbance, it is unlikely the application area comprises a higher level of faunal diversity than surrounding areas.

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

Methodology APM (2012a)
APM (2012b)
CALM (2002)
DEC (2012a)
Mattiske (2009a)
Mattiske (2009b)
Mattiske (2009c)
Western Australian Herbarium (2012)
GIS Database:
- IBRA WA (Regions – Sub Regions)
- Threatened and Priority Flora
- Threatened Ecological Sites Buffered

(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

APM (2012b) identified four broad fauna habitat types within the application area including *Eucalyptus* woodlands, *Callitris* woodlands, *Acacia* shrublands and Mixed shrublands. According to vegetation mapping, landforms in the application area comprise slopes, ridges, banded ironstone outcropping and flats. The banded ironstone outcropping occurs in the north east corner of Windinne Well and is not located within the proposed disturbance footprint (APM, 2012b).

According to APM (2012b), database searches identified eight mammal, 114 bird, three amphibian and 34 reptile species that have been recorded within a 40 kilometre radius of the Bugeye area (middle of the Minjar prospects). Of these 11 species were identified as conservation significant. The desktop assessment revealed that targeted fieldwork was required for two of these species including the Malleefowl (*Leipoa ocellata*) (Vulnerable; Schedule) and Western Spiny-tailed Skink (*Egernia stokesii badia*) (Endangered; Schedule 1). The remainder of the conservation significant species may utilise the application area, however, based on factors such as species mobility, core or preferred habitat requirements and the availability of similar habitat in surrounding areas, these species are unlikely to be significantly impacted by the proposed clearing.

The Malleefowl occupies semi-arid to arid shrublands and low woodlands dominated by mallee and associated habitats, such as broombush *Melaleuca uncinata* and native pine *Callitris* spp. scrub (Frith 1962a, b; Marchant & Higgins 1993; Benshemish 1999; Garnett & Crowley 2000) (cited in APM, 2012b). According to APM (2012a, 2012b), there are large areas of suitable Malleefowl habitat within the Minjar tenements and the species appears to be common with regular sightings of birds by staff and survey teams. A targeted Malleefowl search identified six historic mounds and two old/inactive mounds at Windinne Well and two historic mounds and two old/inactive mounds at Silverstone. Historic mounds (20 to 100 years old) are considered severely weathered and unable to be reused due to loss of structural integrity (APM, 2012a). Old/inactive mounds (1 to 20 years old) show no signs of recent activity, however, still retain structural integrity and can therefore be reused by

Malleefowl. APM (2012a) states that the historic mounds could potentially be destroyed by the proposed clearing. As these mounds are unlikely to be reused, any removal of these mounds is not expected to have a significant impact on this species. APM (2012a) states the inactive/old mounds will not be impacted by the proposed clearing and with the exception of one mound a 50 metre buffer will be placed around the old/inactive mounds. A 20 metre buffer is proposed for the other old/inactive mound as it is located approximately 35 metres from the proposed waste rock dump. This mound is located outside the application area and is surrounded by vegetation to the north, east and south. Management measures including traffic speed reductions, monitoring of existing mounds, implementation of a 250 metre buffer for active mounds, training on Malleefowl identification and recording of any Malleefowl/mounds will be implemented (APM, 2012b). Given the above, the proposed clearing is considered unlikely to have a significant impact on this species. Potential impacts to Malleefowl as a result of the proposed clearing may be minimised by the implementation of a fauna management condition.

The Western Spiny-tailed Skink lives in small family groups and inhabits timber and rock crevices (APM, 2012b). Suitable habitat consists of one area of rock outcrops at Windinne Well and three areas of hollow logs at the base of Eucalyptus groves at Silverstone (APM, 2012a). Two of the areas at Silverstone are located outside the application area. A targeted search involving trapping did not identify any direct or secondary evidence of the skink within these areas. According to APM (2012a), these areas are not located within the proposed disturbance footprint and will be avoided where possible. However, if impacts are proposed any potential habitat hollows will be moved a short distance and placed on the edge of the disturbance area (APM, 2012a).

According to APM (2012a), there are two records of the Shield-backed Trapdoor Spider (*Idiosoma nigrum*) (Schedule 1) in close proximity to the application area. Naturemap shows a record approximately one kilometre to the west (DEC, 2012b). Nearby surveys have recorded the spider on upper to lower slopes of ranges and on plains along the banks of well-established drainage lines. Estimates on ironstone ridges in the region range from 20,000 to 230,000 spiders per ridge (Bamford, 2007, 2012) (cited in APM, 2012a). Within the application area, potentially suitable habitat includes *Acacia* shrubland on orange brown sandy loam with rock cover on slopes and ridges (approximately 57.4 hectares) at Windinne Well and *Acacia* shrubland on orange brown sandy loam with rock cover on lower slopes (approximately 11.4 hectares) at Silverstone. The spider is not expected on the plains due to the lack of established drainage lines. The application area was surveyed by the Principle Zoologist at APM in 2011 and included searches for the Shield-backed Trapdoor Spider (APM, 2012a). This included survey transects every 30 metres throughout the application area. Two extinct trapdoor spider burrows were found at Silverstone outside the proposed disturbance footprint. These are considered unlikely to be Shield-backed Trapdoor Spider burrows due to the absence of leaf or twig matter. APM (2012a) notes that the high number of goats at Windinne Well and Silverstone may have also contributed to the absence of this species in the area. Based on the above the proposed clearing is unlikely to have a significant impact on this species.

A Stygofauna Pilot Study was conducted in the Minjar tenements in July 2009 by Outback Ecology Services (Outback Ecology). This study identified stygofauna within a pastoral bore located within the shallow perched alluvial aquifer and no stygofauna within four bores located within the deeper fractured rock aquifer (Outback Ecology, 2009). The taxa recorded were typical for the region and have been shown in other studies to prefer alluvial aquifers and have dispersal capabilities (Outback Ecology, 2009).

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

Methodology APM (2012a)
APM (2012b)
DEC (2012b)
Outback Ecology (2009)

(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 databases, there are no records of Threatened Flora within the application area (GIS Database). According to APM (2012a, 2012b), no Threatened Flora species have been recorded during current and previous surveys of the application area.

The Threatened Flora species, *Stylidium scintillans*, has been recorded from approximately 4.5 kilometres south and 8.5 kilometres north east of the application area (GIS Database). This species is confined to the upper slopes and summits of low rises and breakaways composed of highly weathered granitic basement rock with weathered or colluvial ironstone rock and kaolinitic residue (Wege, 2012). It grows in rocky, shallow, pale brown clay-loam soils, with individuals sometimes growing out of rock fissures (Wege, 2012). Windinne Well consists of orange brown sandy loam with rock cover on slopes and ridges; orange-brown rocky shale and quartz upper-slopes and ridges; rocky orange-brown sandy loam on mid to upper-slopes; and orange-brown rocky upper-slopes and ridges with occasional exposed banded ironstone outcrops and therefore contains some elements of this species habitat. However, according to APM (2012a), there are no granitic outcrops in the application area and the banded ironstone outcropping occurring within the application area will be avoided with a 50 metre buffer placed around the outcropping and the surrounding S12 vegetation community it occurs in. APM have also used the presence of *Micromyrtus acuta* to identify suitable habitat across the Minjar Projects. *Stylidium*

scintillans has reportedly been found in the presence of this species, along with *Borya spheroccephala* and *Styloidium longibracteatum* at multiple sites (*Micromyrtus acuta* is mentioned in seven of the 12 records listed on Florabase (APM, 2012a)). Of the previous surveys conducted on the Minjar tenements, this species has only been recorded by Mattiske near the Keronima Project (over 20 kilometres south of Silverstone) (APM, 2012a). Based on the above, it is considered unlikely that this species occurs within the application area.

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

Methodology APM (2012a)
APM (2012b)
Wege (2012)
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 (TECs) within the application area (GIS Database). The nearest known TEC is approximately 60 kilometres south west of the application area (GIS Database).

No TECs have been recorded within the application area (APM, 2012a, 2012b).

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

Methodology APM (2012a)
APM (2012b)
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 falls within the Yalgoo Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 98.6% of the pre-European vegetation remains (see table) (GIS Database, Government of Western Australia, 2011).

The vegetation of the application area has been mapped as the following Beard vegetation associations (GIS Database):

202: Shrublands; mulga and *Acacia quadrimarginea* scrub;
352: Medium woodland; York gum; and
420: Shrublands; bowgada and jam scrub.

With the exception of Beard vegetation association 352, over 95% of these vegetation associations remain at a state and bioregional level (Government of Western Australia, 2011). Only 19.84% of Beard vegetation association 352 remains at a state level, however, approximately 99.83% of this association remains at a bioregional level (Government of Western Australia, 2011). This association comprises approximately 19% or 68 hectares of the application area (GIS Database). Based on the above, the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA bioregion – Yalgoo	5,057,314	4,987,193	~98.61	Least Concern	~10.88 (~10.90)
IBRA Subregion - Tallering	3,498,944	3,449,835	~98.60	Least Concern	~2.14 (~2.17)
Local Government – Yalgoo	2,794,644	2,790,720	~99.86	Least Concern	-
Beard vegetation associations - State					
202	448,529	448,344	~99.96	Least Concern	~0.39 (~0.39)
352	724,278	143,678	~19.84	Vulnerable	~0.42 (~2.08)
420	859,632	829,977	~96.55	Least Concern	~0.06 (~0.06)
Beard vegetation associations - Bioregion					
202	45,096	45,012	~99.81	Least Concern	-
352	14,281	14,257	~99.83	Least Concern	-
420	621,396	620,054	~99.78	Least Concern	~0.02 (~0.02)
Beard vegetation associations - Subregion					
202	52,004	51,901	~99.80	Least Concern	-
352	12,446	12,423	~99.82	Least Concern	-
420	549,363	548,406	~99.83	Least Concern	-

* Government of Western Australia (2011)

** 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 (2011)
GIS Database:
- IBRA WA (Regions – Sub Regions)
- 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 five minor, non-perennial watercourses within the application area (GIS Database). These appear as short isolated watercourses that drain into the surrounding landscape. Available databases show these are numerous in the surrounding area (GIS Database). According to APM (2012b), there are no wetlands or watercourses in the areas proposed to be cleared and watercourses in the area are scarce with surface water flow occurring as sheet flow.

Sixteen vegetation communities occur within the application area, none of which were identified as growing in association with a watercourse or wetland. Management measures include designing the haul/access road to allow water overflow across its length to preserve current wash conditions as far as practicable (APM, 2012b). Based on the above, the proposed clearing is not likely to have a significant impact on watercourses within the area.

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

Methodology APM (2012b)
GIS Database:
- Badja 1.4m Orthomosaic - Landgate 2003
- 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 application area has been mapped as occurring on the Illaara, Tallering, Tealtoo and Watson land systems (GIS Database). The Illaara land system comprises gravelly plains supporting mulga-casuarina shrublands and is generally not susceptible to soil erosion (Payne et al., 1998). The Tallering land system comprises prominent ridges and hills of banded ironstone, dolerite and sedimentary rocks supporting bowgada and other acacia shrublands. Stone mantles in this system provide effective protection against soil erosion; however, disturbance or removal of stone mantles may initiate erosion (Payne et al., 1998). The Tealtoo land system comprises level to gently undulating loamy plains with fine ironstone lag gravel supporting dense acacia

shrublands and is not generally prone to soil erosion (Payne et al., 1998). The Watson land system comprises hills, rises and gravelly plains on sedimentary rocks supporting bowgada shrublands with non-halophytic undershrubs. Stone and gravel surface mantles provide effective protection against erosion, however, disturbance or removal of mantles may initiate erosion (Payne et al., 1998). Based on the above there is potential for erosion to occur, particularly where mantles are disturbed or removed. Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

The average annual evaporation rate is over 11 times the average annual rainfall, so recharge to the groundwater would be expected to be minimal, thereby reducing the likelihood of raised saline water tables occurring as a result of the proposed clearing (BoM, 2012; GIS Database).

APM (2012b) states that a series of strengthened water channels will be designed to divert water into silt traps before allowing the water to flow into the shrubland.

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

Methodology APM (2012b)
BoM (2012)
Payne et al. (1998)
GIS Database:
- Evaporation Isopleths
- Rangeland Land System Mapping

(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 application area does not lie within any conservation areas or Department of Environment and Conservation (DEC) managed lands (GIS Database). The nearest conservation area is the former leasehold Warriedar pastoral station, located approximately one kilometre east of the application area (GIS Database). Based on this distance and the largely uncleared landscape surrounding the application area, the proposed clearing is not likely to impact the environmental values of any 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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). There are no permanent waterbodies or watercourses within the application area, however, there are five minor, non-perennial watercourses within the application area (GIS Database). According to APM (2012b), there are no wetlands or watercourses in the areas proposed to be cleared and watercourses in the area are scarce with surface water flow occurring as sheet flow.

The annual average rainfall for Yalgoo is 259.8 millimetres and the average annual evaporation rate for the application area is approximately 3,000 millimetres (BoM, 2012; GIS Database). Based on this, surface water is likely to evaporate quickly with surface sheet flow and higher sediment levels generally occurring during larger rainfall events. Therefore, during normal rainfall events, the proposed clearing would not likely lead to an increase in sedimentation of watercourses within the application area.

According to available databases, groundwater salinity within the application area is between 3,000 and 7,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered brackish to saline. The proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

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

Methodology APM (2012b)
BoM (2012)
GIS Database:
- Evaporation Isopleths
- 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 application area is located within the YarraMonger catchment area (GIS Database). Given the size of the area to be cleared (119 hectares) in relation to the size of the catchment area (4,182,476 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

With an average annual rainfall of 259.8 millimetres and an average annual evaporation rate of 3,000 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2012; GIS Database). Whilst large rainfall events may result in flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2012)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments - Catchments

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

Comments

There is one native title claim over the area under application: WC9772 (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant group. 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*.

According to available databases, 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.

The clearing permit application was advertised on 20 August 2012 by the Department of Mines and Petroleum inviting submissions from the public. The clearing permit application was readvertised on 12 November 2012 following an increase in the area applied to clear from 85 hectares to 119 hectares. There were no submissions received during either advertisement period.

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

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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.