Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2951/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Talison Minerals Pty Ltd**

1.3. Property details

Property: Mining Lease 45/923
Local Government Area: Town Of Port Hedland
Colloquial name: TSF3 Wodgina Operations Expansion Project

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia. One Beard Vegetation Association is located within the application area (Shepherd et al., 2001): **Beard Vegetation Association 626:** Hummock grasslands, shrub-steppe, kanji over soft Spinifex and *Triodia brizoides*. Outback Ecology (2008) undertook a flora and vegetation survey over the application area in May 2008. The survey identified the following five vegetation types within the application area (Outback Ecology, 2008): **1**. *Acacia acradenia* scattered shrubland over *Triodia wiseana* closed hummock grassland; **2**. *Acacia acradenia* closed shrubland over *Triodia wiseana* hummock grassland; **3.** *Triodia wiseana* closed hummock grassland; **4.** *Grevillea wickhamii*, *Acacia acradenia*, *Cajanus cinereus*, *Triumfetta maconochieana* and *Senna glutinosa* closed heath; **5.** *Acacia tumida* open shrubland over *Indigofera rugosa*, *Abutilon diocium*, *Triumfetta chaetocarpa* and *Triodia wiseana* closed herbland.	Talison Minerals (2009) proposes to clear up to 15 hectares of native vegetation within an area of approximately 60 hectares. The proposed clearing is located approximately 100 kilometres south of Port Hedland (GIS Database). The purpose of the proposed clearing is for the expansion of a tailings storage facility (EnviroWorks, 2008). Vegetation clearing will be undertaken via mechanical means and tailings will be deposited gradually over the life of the clearing permit (Talison Minerals, 2009).	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994). To Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).	The vegetation condition rating was based on the flora and vegetation survey of the proposed clearing area which was conducted by Outback Ecology in May 2008. The application area is adjacent to an existing tailings dam (Outback Ecology, 2008). The vegetation condition was reported as being in very good to excellent condition, however, there was one area directly adjacent to the existing tailings dam wall that was assessed as being degraded due to previous disturbances (Outback Ecology, 2008).

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 Chichester Interim Biogeographic Regionalisation for Australia (IBRA) subregion (GIS Database). The Chichester subregion is characterised by undulating Archaean granite and basalt plains with significant areas of basaltic ranges (CALM, 2002). At a broad scale, vegetation can be described as shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands on

plains, while *Eucalyptus leucophloia* tree steppes occur on ranges (CALM, 2002).

The application area lies within a broad valley surrounded by rocky ridges and hills (Bamford, 2008). The southern application area contains a valley located between elevated rocky ridges whilst the western side of the application area is fringed by a long, linear ridge that contains caves and minor gorges (Bamford, 2008). These ridge areas are reported to be significant fauna habitat, however, EnviroWorks (2008) report that the proportion of this habitat in the local area to be impacted is low at 0.14% of the total habitat available in the local area.

Outback Ecology conducted a flora and vegetation survey over an area that included the application area in May 2008. This survey identified a total of 111 flora taxa from 36 families and 69 genera (Outback Ecology, 2008). The most common families within the areas surveyed were *Poaceae* and *Amaranthaceae* (Outback Ecology, 2008). Compared to other surveys conducted in the region this area represents a fairly high level of floral diversity.

Outback Ecology (2008) reported three weed species as occurring within the application area: Kapok Bush (*Aerva javanica*), Buffel Grass (*Cenchrus ciliaris*) and Wild Passionfruit (*Passiflora foetida* subsp. *Hispida*). The presence of introduced flora species would lower the biodiversity value of the application area and therefore, care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of weed management.

Bamford Consulting Ecologists (Bamford) conducted a fauna survey of the application area in May 2008. This survey identified six major fauna habitats within the project area, two of which are reported as being significant fauna habitat (EnviroWorks, 2008). The desktop survey performed by Bamford (2008), identified 285 fauna species that could potentially occur within the area. The field survey performed by Bamford (2008) recorded a total of 73 fauna species, comprised of 49 birds, 11 mammals, 11 reptiles and 2 frogs. Based on the above, the application area is likely to have a high diversity of fauna species, most likely due to the presence of the ridges within the application area. EnviroWorks (2008) report that only 0.14% of this habitat type is likely to be impacted by the proposal and therefore, the proposed clearing is not likely to have a significant impact upon the diversity of fauna species within the area.

Based on the above, the proposed clearing may be at variance to this Principle. However, the vegetation and habitat types are not restricted to the application area, and therefore the proposed clearing of 15 hectares of native vegetation is unlikely to have a significant impact upon biological diversity within the region.

Methodology

Bamford (2008)
CALM (2002)
Enviroworks (2008)
Outback Ecology (2008)
GIS Database
- Interim Biogeographic Regionalisation for Australia

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

Comments

Proposal is at variance to this Principle

Bamford (2008) was commissioned by Talison Minerals to conduct a literature review and site inspection to identify fauna and habitat values of the project area. The survey was carried out in May 2008 and was conducted in accordance with the Environmental Protection Authority (EPA) Position Statement No.3 and Guidance Statement 56: Guidance for the Assessment for Environmental Factors - Terrestrial Fauna for Environmental Impact Assessment in Western Australia (EPA 2002; 2004).

Bamford (2008) identified the following broad habitat types within the application area:

1. Low Stony Rises: low stony rises supporting *Triodia wiseana* (and other *Triodia* species) with isolated to scattered *Acacia* shrubs and *Eucalyptus leucophloia*;
2. Narrow Drainage Systems: narrow drainage systems supporting tall shrublands / low woodlands of *Acacia* species (including *Acacia tumida*), *Corymbia hamersleyana*, *Triodia pungens* and mixed shrubs. Occurs in the north of the project area and also includes some dense *Acacia* thickets;
3. Minor Drainage Tracts: minor drainage tracts supporting scattered shrublands including *Acacia* species and *Grevillea wickhamii*;
4. Rocky Ridges: rocky ridges with steep upper slopes and significant areas of ironstone outcropping containing numerous caves, overhangs and crevices. Lower slopes support hummock grasslands of *Triodia wiseana* and *T. pungens* with scattered *Acacia inaequilatera* and *Eucalyptus leucophloia*;
5. Gullies and minor gorges: this habitat occurs in small areas;
6. Previously disturbed areas

Bamford (2008) reports that although the survey area contains mostly widespread and common habitats, three significant habitats occur in the project area that are known to support Short Range Endemic (SRE) fauna:

- Ironstone Ridges: these are identified as important habitat that may support a number of species of conservation significance, and is an uncommon habitat in the area;

- Channels and Creek lines: these are identified as important habitat due to the high concentration of species they support and their linear alignment allows for the movement of fauna. Due to the importance of watercourses and associated habitats, hydrological processes are likely to be very important for fauna;

- Caves and Minor Gorges are a rare fauna habitat and support conservation significant fauna including SRE's.

The Ironstone Ridges and Caves and Minor Gorges habitat types are considered to be significant habitat to fauna species, particularly the Northern Quoll (*Dasyurus hallucatus*) and the Olive Python (*Liasis olivaceus barroni*) (EnviroWorks, 2008). The proportion of these habitat types in the local area likely to be impacted by the proposed clearing is low (approximately 0.14%) and therefore, the habitat disturbance is not likely to pose a significant risk to any fauna species (EnviroWorks, 2008).

The following fauna species of conservation significance are likely to occur within the application area based on preferred habitat type and range (EnviroWorks, 2008):

- Australian Bustard (*Ardeotis australis*) – Priority 4 on the Department of Environment and Conservation's (DEC's) Threatened and Priority Fauna list;
- Bush Stone-curlew (*Burhinus grallarius*) – Priority 4 on the DEC's Threatened and Priority Fauna list;
- Long-tailed Dunnart (*Sminthopsis longicaudata*) – Priority 3 on the DEC's Threatened and Priority Fauna list;
- Northern Quoll (*Dasyurus hallucatus*) – Schedule 1 (Fauna that is rare or likely to become extinct), *Wildlife Conservation* (*Specially Protected Fauna*) *Notice 2008* and Vulnerable, *Environment Protection and Biodiversity Conservation* (*EPBC*) *Act*, *1999*;
- Olive Python (*Liasis olivaceus barroni*) – Schedule 1 (Fauna that is rare or likely to become extinct), *Wildlife Conservation* (*Specially Protected Fauna*) *Notice 2008* and Vulnerable, *EPBC Act*, *1999*;
- Peregrine Falcon (*Falco peregrinus*) – Schedule 4, Wildlife Conservation (Specially Protected Fauna) Notice 2008;
- Rainbow Bee-eater (*Merops ornatus*) – Marine and Migratory, *EPBC Act 1999* and *Japan-Australia Migratory Bird Agreement* (*JAMBA*);
- A skink (*Ctenotus nigrilineata*) – Priority 1 on the DEC's Threatened and Priority Fauna list;
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 on the DEC's Threatened and Priority Fauna list.

The Australian Bustard is a dispersive species with widespread movements over long distances (DECC, 2005a). The Australian Bustard is known to inhabit grasslands, low shrublands, grassy woodlands as well as altered environments such as croplands and airfields (DECC, 2005a). This species was recorded during the fauna survey of the application area and suitable habitat for this species exists within the application area. Given the widespread distribution of this species it is unlikely that the vegetation within the application area would represent significant habitat for this species.

The range of the Bush Stone-Curlew extends throughout Australia (Australian Museum, 2003). The species prefers relatively undisturbed grasslands and grassy woodlands with a groundcover of fallen timber and leaf litter (DECC, 2005b). The Bush Stone-curlew is known to nest on bare ground and often returns to the same site each year (DECC, 2005b). This species was recorded during the fauna survey of the application area, however, given the widespread distribution of this species it is unlikely that the vegetation within the application area represents significant habitat for this species.

The Long-tailed Dunnart occurs in rugged rocky landscapes that support low open woodland or shrubland of *Acacia's* (especially Mulga) with an understorey of spinifex hummocks (DNREA, 2007). Potential habitat for this species occurs within the application area and Bamford (2008) have reported that it is likely to occur in areas of rocky hills.

Significant Northern Quoll habitat in the Wodgina area consists of large rocky outcrops and ridges, containing caves, cracks and crevices for shelter. While Quolls may forage over other areas, actual shelter (and therefore breeding habitat) is restricted to these rocky areas. This type of habitat occurs within the application area, along the western ridge to be impacted by the 15 metre lift and in a small area or rocky outcrop within the south of the application area. This species was recorded during the fauna survey of the application area (Bamford, 2008).

Olive Pythons occur in rocky areas such as gorges, caves, and rock crevices and can also burrow beneath rocks or occur in hollow logs (Bamford, 2008). This python is often associated with water (in search of prey) and may also search for prey in grassy areas surrounding rocky outcrops (Bamford, 2008). Habitat critical for the survival of this species is likely to include rocky outcrop areas and gnamma holes (rock pools containing water).

Important Olive Python habitat occurs both along the western ridge to be impacted by the 15 metre lift and in a small area of rocky outcrop within the southern expansion footprint. This species has been reported as occurring within the area by staff at the mine (Bamford, 2008).

The Peregrine Falcon is known to inhabit most areas in Australia and utilises cliffs, tall trees and granite outcrops for nesting (Australian Museum, 2007). This species is likely to occur within the application area in areas of rocky ridges (Bamford, 2008).

The Rainbow Bee-eater inhabits lightly wooded, preferably sandy country near water (Johnstone and Storr, 1998 as cited in Bamford, 2008). In the Wodgina area this habitat is mostly restricted to wooded drainage lines containing sandy banks and associated sandy floodplains. The Rainbow Bee-eater constructs its nests in burrows in flat ground, gently elevated slopes, sandy banks or cuttings and often at the margins of roads or tracks (Bamford, 2008). Potential breeding habitat for the Rainbow Bee-eater includes the sandy banks of major watercourses and the associated sandy plains, although nesting may occur along roads in sandy areas. This species was recorded during the fauna survey however, based on the widespread distribution of this species, the vegetation of the application area is unlikely to represent significant habitat for this species.

The skink (*Ctenotus nigrilineata*) is only known from Woodstock in the arid interior of the Pilbara (Storr et al., 1999 as cited in Bamford, 2008). This species was recorded within the application area from *Triodia pungens* hummock grassland at the base of granite outcrops (Bamford, 2008). This habitat type is widespread in surrounding areas and therefore, the vegetation of the application area is unlikely to represent significant habitat for this species.

The Western Pebble-mound Mouse generally occurs on gentler slopes of rocky ranges where the ground is covered by a stony mulch and vegetated by hard spinifex, often with an overstorey of eucalypts and scattered shrubs (Van Dyck and Strahan, 2008). Mounds are often sited close to narrow ribbons of *Acacia*-dominated scrub that grows along incised drainage lines (Van Dyck and Strahan, 2008). Numerous mounds of this species has been found near the application area, however, all mounds found have been inactive mounds (Bamford, 2008).

Bamford (2008) reports that the proposed disturbance area contains habitat suitable to support short-range endemic species. Such habitat includes caves, rocky crevices, small rock pools and areas within gullies and gorges where moisture is concentrated (Bamford, 2008). The project area lies within an approximate 4000 hectare area of isolated rocky uplands surrounded by plains (Bamford, 2008). As a result, some locally occurring invertebrate species restricted to rocky areas may have undergone some level of speciation in the region (Bamford, 2008). Bamford (2008) conducted a search for short-range endemic invertebrates wherever suitable habitat (such as caves and gullies) was found, however, no taxa likely to include short range endemic species were encountered. The gully habitats and caves present are reported by Bamford (2008) as being ideal habitat for short-range invertebrates, particularly land snails, and therefore, it should be assumed that some short-range endemic invertebrate species occur within the project area.

Based on the above, the proposed clearing is at variance to this Principle. Notwithstanding, the areas of significant habitat proposed to be cleared only represent approximately 0.14% of these habitat types available in the local area, therefore, the proposed clearing is unlikely to have a large impact upon significant fauna habitat in the region.

Methodology

Australian Museum (2003)
Australian Museum (2007)
Bamford (2008)
DECC (2005a)
DECC (2005b)
DNREA (2007)
EnviroWorks (2008)
EPA (2002)
EPA (2004)
Van Dyck and Strahan (2008)

(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

Outback Ecology conducted a flora and vegetation survey of the application area in May 2008. The survey was conducted in accordance with the Environmental Protection Authority (EPA) Guidance Statement 51: *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004). The survey consisted of a desktop review in addition to a field survey undertaken between 6 to 9 May 2008 (Outback Ecology, 2008).

A search of DEC databases has recorded two Priority flora species as occurring within 20 metres of the application area (DEC, 2009a):

- *Acacia levata* (Priority 3); and
- *Euphorbia clementii* (Priority 2).

Acacia levata occurs in fissures in outcrops and among boulders on gritty, skeletal red-grey sandy loam, light orange-brown gravely sand and granite (Outback Ecology, 2008). The preferred habitat of *Euphorbia clementii* is reported as being gravely hillsides and stony grounds (DEC, 2009b).

Outback Ecology (2008) reported that no Declared Rare Flora (DRF) or Priority flora taxa were recorded within the application area during the field survey.

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

Methodology DEC (2009a)
DEC (2009b)
EPA (2004)
Outback Ecology (2008)

(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**
There are no known Threatened Ecological Communities (TEC's) within the area applied to clear, or within 100 kilometres of the application area (GIS Database). At such distance from the application area, these ecosystems are unlikely to be affected by the proposed clearing.

Outback Ecology (2008) reported that no TEC's were identified during the flora and vegetation survey of the application area.

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

Methodology Outback Ecolgy (2008)
GIS Database
- Threatened Ecological Communties

(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 thePilbara IBRA Bioregion. Shepherd et al. (2001) report that approximately 99.9% of the pre-European vegetation still exists in this Bioregion (see table). The vegetation in the application area is recorded as Beard Vegetation Association 626: Hummock grasslands, shrub-steppe, kanji over soft Spinifex and *Triodia brizioides* (Shepherd et al, 2001). According to Shepherd et al. (2001) approximately 100% of this vegetation association remains within the Bioregion (see table below). Furthermore, the vegetation association is well represented in conservation estate (Shepherd et al, 2001).

Therefore the vegetation within the application area is not 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
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~99.9	Least Concern	6.3
Beard veg assoc. – State					
626	117,725	117,725	~100	Least Concern	15.6
Beard veg assoc. – Bioregion					
626	117,725	117,725	~100	Least Concern	15.6

* Shepherd et al. (2001) updated 2005
** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd et al. (2001)

GIS Database
- Interim Biogeographic Regionalisation of Australia

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

Comments

Proposal is at variance to this Principle

The application area contains a minor, ephemeral drainage lines (GIS Database). Outback Ecology (2008) have reported two vegetation units within the application area that are generally associated with watercourses:

1. *Grevillea wickhamii*, *Acacia acradenia*, *Cajanus cinereus*, *Triumfetta maconochieana* and *Senna glutinosa* closed heath;

2. *Acacia tumida* open shrubland over *Indigofera rugosa*, *Abutilon diocium*, *Triumfetta chaetocarpa* and *Triodia wiseana* closed herbland.

These vegetation units are reported by EnviroWorks (2008) as being in excellent condition. Outback Ecology (2008) state that the vegetation associations are well represented in surrounding areas and throughout the Pilbara region generally.

Based on the above, the proposed clearing is at variance to this Principle, however, the vegetation units associated with watercourses are well represented locally and within the Pilbara region generally and therefore, the proposed clearing is unlikely to have any significant impacts at a regional scale given their widespread distribution.

Should a permit be granted, it is recommended that if any watercourses are to be disturbed the proponent should liaise with the Department of Water (DoW) to determine whether a Bed and Banks permit is necessary for the proposed works.

Methodology

EnviroWorks (2008)
Outback Ecology (2008)
GIS Database
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments

Proposal is not likely to be at variance to this Principle

The application area has been mapped as occurring within the Capricorn Land System (GIS Database).

The Capricorn Land System consists of hills and ridges of sandstone and dolomite supporting shrubby hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). It is described as consisting of erosional surfaces; ranges and hills with steep rocky upper slopes, more gently sloping stony footslopes, restricted stony lower plains and valleys; and moderately spaced tributary drainage patterns (Van Vreeswyk et al., 2004). This land system is reported by Van Vreeswyk et al. (2004) as being rugged, poorly accessible country with a stoniness that confers resistance to erosion.

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

Methodology

Van Vreeswyk et al. (2004)
GIS Database
- 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 nearest conservation area is the Mungaroona Range Nature Reserve located approximately 55 kilometres south-west of the application area (GIS Database). Given the distance of the application area from any conservation areas, the proposed clearing of native vegetation is not expected to have an impact on the environmental values of any conservation areas.

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

Methodology

GIS Database
- CALM Managed Land and Waters

(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 is located within an arid region with an average annual rainfall of approximately 361.7 millimetres falling mainly during the summer months (BOM, 2009). Based on an average annual evaporation rate of approximately 2,500 millimetres, any surface water resulting from rain events is relatively short-lived (EnviroWorks, 2008).

The application area has a minor, ephemeral drainage line running through it (GIS Database). Based on the climate of the region, this creek is expected to be dry except following significant rainfall events which are typically associated with tropical cyclones. Therefore, the proposed clearing is unlikely to have a significant impact upon surface water quality in the area.

The proposed clearing area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The application area is located within an area of already altered hydrology caused by the Tailings Storage Facility (EnviroWorks, 2008). It is unlikely that the clearing of 15 hectares of vegetation will result in any further significant changes to local groundwater levels or quality.

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

Methodology

BOM (2009)
EnviroWorks (2008)
GIS Database
- 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 an arid region where the average annual evaporation rate greatly exceeds the average annual rainfall (BOM, 2009). There is a minor, ephemeral watercourse located within the application area (GIS Database). This watercourse is expected to be dry for most of the year, and is likely to only flow immediately following significant rainfall.

Natural flood events occur in the Pilbara following cyclonic activity. However, the proposed clearing is not expected to increase the incidence or intensity of such events given the size of the area to be cleared (15 hectares) in comparison to the Turner River (480,200 hectares) and Yule River (886,100 hectares) catchment areas (GIS Database).

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

Methodology

BOM (2009)
GIS Database
- Hydrography, linear
- Hydrographic Catchments - Catchments

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

Comments

There is one Native Title claim (WC99/003) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the tenement 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 numerous Aboriginal Sites of Significance within the vicinity of the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no 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.

There were no public submissions received during the public comments period.

Methodology

GIS Database
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

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

Should the permit be granted it is recommended that conditions be imposed for the purposed of weed management, rehabilitation, record keeping and permit reporting.

5. References

Australian Museum (2003) Bush Stone-curlew. Australian Museum Online. Available online from: http://www.austmus.gov.au/factsheets/curlew.htm. Accessed 15 April 2009.

Australian Museum (2007). Birds, Peregrine Falcon. Australian Museum Online. Available online from: http://www.austmus.gov.au/wild_kids/birds/perigrine_falcon.htm Accessed 14 April 2009.

Bamford (2008) Fauna Assessment of the Wodgina Tailings Storage Facility 3. Bamford Consulting Ecologists, Western Australia.

BOM (2009) Marble Bar, Western Australia. Bureau of Meteorology. Available online from: http://www.bom.gov.au. Accessed 14 April 2009.

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.

DEC (2009a) NatureMap. Department of Environment and Conservation. Available online from: http://naturemap.dec.wa.gov.au./Login.aspx?ReturnUrl=%2fnaturemap%2fdefault.aspx. Accessed 14 April 2009.

DEC (2009b) Florabase: the Western Australia Flora. Department of Environment and Conservation. Available online from: http://florabase.calm.wa.gov.au/. Accessed 26 March 2009.

DECC (2005a) Australian Bustard - profile. Department of Environment and Climate Change. Available online from: http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10063. Accessed 26 March, 2009.

DECC (2005b) Bush Stone-curlew - profile. Department of Environment and Climate Change. Available online from: http://www.threatenedspecies.environment.nsw.gov.au/. Accessed 26 March, 2009.

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.

DNREA (2007). Threatened Species Of The Northern Territory - Long-Tailed Dunnart (Sminthopsis longicaudata) [online]. Available from: http://nt.gov.au/nreta/wildlife/animals/threatened/pdf/mammals/longtailed_dunnart_vu.pdf Accessed. Department of Natural Resources, Environment and the Arts, Northern Territory.

EnviroWorks (2008) Clearing Permit Application: Tailings Storage Facility 3 Expansion: Talison Minerals Pty Ltd: Wodgina Operations. EnviroWorks Consulting, Western Australia.

EPA (2002) Terrestrial Biological Surveys as an element of biodiversity protection. Position Statement No. 3. March 2002. Environmental Protection Authority.

EPA (2004) Guidance for the Assessment of Environmental Factors - terrestrial flora and vegetation surveys for Environmental Impact Assessment in Western Australia. Report by the EPA under the Environmental Protection Act 1986. No. 51 WA.

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Outback Ecology (2008) Talison Minerals: Wodgina Operations and Mt Francisco: Vegetation and Flora Survey and DRF and Priority Targeted Search. Outback Ecology Services, Western Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

Talison Minerals (2009) Clearing Permit Application Supporting Documentation, February 2009.

Van Dyck, S. and Strahan, R. (eds.) (2008) The Mammals of Australia. Third Edition. New Holland Publisher (Australia) Pty Ltd, Australia.

Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P. and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia. Department of Agriculture, Western Australia.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs

DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DMP	Department of Mines and Petroleum, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

P1	**Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	**Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	**Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	**Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	**Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X	**Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

Schedule 1	**Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
Schedule 2	**Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
Schedule 3	**Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
Schedule 4	**Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

P1	**Priority One: Taxa with few, poorly known populations on threatened lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
P2	**Priority Two: Taxa with few, poorly known populations on conservation lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
P3	**Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of

conservation status before consideration can be given to declaration as threatened fauna.

P4 **Priority Four: Taxa in need of monitoring**: Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

P5 **Priority Five: Taxa in need of monitoring**: Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999)*

EX **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

EX(W) **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.