Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1125/1

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Harmony / Mt Magnet Gold NL**

1.3. Property details

Property: M58/30
M58/81
M58/119
M58/179
M58/186
M58/233

Local Government Area: Shire Of Mount Magnet

Colloquial name: Britannia Well

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
30		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 association 312: Succulent steppe with very open shrubs; very sparse mulga and *Acacia sclerosperma* with salt bush and bluebush (Shepherd et al. 2001). A flora and vegetation assessment was conducted by the Environmental Officers of Harmony Gold on 24 December 2005 and 18 January 2006 with much of the flora identified in the field or at the Mt Magnet Gold offices from specimens collected. Unknown species were collected and sent to Western Botanical for verification. Western Botanical was commissioned by Mt Magnet Gold (MMG) to prepare a flora assessment of the Britannia Well prospect based on observations of the site by MMG staff, photographs of the site and specimens supplied to Western Botanical for verification (Western Botanical 2006).	The proposed clearing of 30ha is for the development of the Britannia Well mining operation and associated infrastructure (waste dump, ore pad, pits, topsoil stockpiles and haul roads). The vegetation and topsoil will be cleared by a bulldozer and stored separately for use in rehabilitation works.	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)	The proposed clearing area has been heavily disturbed by historic mining and pastoral grazing activities and as result the biodiversity of the area appears to have been affected. The proposed Britannia Well open pit and ore pad sites appear bare with little or no vegetation present (Harmony 2006; Western Botanical 2006).

The project area is dominated by a gravely plain with little vegetation present. The vegetation present is characterised by Mulga (*Acacia aneura*) shrublands with sclerophyllous shrub and grass dominated understoreys. Species present within the proposed clearing area are typical of the Jundee land system and include *Acacia aneura, Acacia tetragonophylla, Acacia grasbyi, Acacia ramulosa, Ptilotus obovatus, Mairiana georgi, Mairiana glomeriifolia, Eremophila foliosissima, Eremophila forrestii, Eremophila fraseri, Hakea preisii* and *Solanum lasiophyllum* (Western Botanical 2006).

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 area of proposed clearing is found within the Eastern Murchison Interim Biogeographic Regionalisation for Australia (IBRA) subregion which encompasses an area of 21,135,046 ha (GIS database). The vegetation types that have been identified and described for the areas applied to clear are common and widespread throughout this subregion, with almost 100% of the pre-European vegetation remaining (Shepherd et al. 2001).

The Britannia Well project area has been previously disturbed by historic mining and pastoral activities and as a result little vegetation is present within the proposed clearing areas (Harmony 2006; Western Botanical 2006). The vegetation is characterised by low densities of shrub species and low species richness (Harmony 2006), and photographs of the application area show that the vegetation condition ranges from very good to completely degraded (Keighery 1994). It is unlikely that the biodiversity at the site of this proposal will be considered outstanding or of higher diversity than in the surrounding bioregion, Shire of Mt Magnet or local area.

In consideration of the above, the proposal is not likely to be at variance to this principle (CALM 2006).

Methodology

CALM (2006)
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00
- Pre-European Vegetation - DA 01/01
Harmony (2006)
Keighery (1994)
Shepherd et al. (2001)
Western Botanical (2006)

(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

According to CALM's Threatened and Priority fauna database there are no known records of any species of conservation significance within the proposed clearing area. The nearest known record is located approximately 60 km north-west of the project area (GIS database).

The vegetation and landforms within the proposed clearing areas are not uncommon in the Murchison region (Curry et al 1994. Large areas of similar habitat exist in adjacent areas to the project area and any affected fauna would most likely be able to relocate into these surrounding areas (Harmony 2006).

The proposed clearing area has been heavily disturbed as a result of historic mining and pastoral activities which is likely to have impacted on the habitat value for fauna species of conservation significance (Harmony 2006). The vegetation within the project area is regarded as remnant and/or regenerated to some degree, and is characterised by low densities of shrub varieties with a low species richness (Harmony 2006). The diversity of landforms and vegetation types within the proposed clearing area is low in terms of ranges, ridges or caves suitable to provide habitat for fauna (Harmony 2006; K de Roer, Senior Environmental Officer, Harmony Gold, pers. comm., 29 March 2006). A fauna survey carried out by Harmony personnel at the Britannia Well project

area from 20 April to 2 May 2006 recorded one house mouse (*mus musculus*) and one Torresian crow (*corvus orru*). No species of conservation significance were recorded or observed during the survey. The survey had a total trapping effort of 286 trap-nights (26 cage and 260 Elliot) (F Somesan, Environmental Officer, Harmony Gold, pers. comm., 11 May 2006).

Based on the sparse vegetation of the area and previous disturbance by historic mining and grazing, the proposed clearing is not likely to have an impact on significant fauna habitat, or affect the conservation status of any species which may potentially occur with the proposed clearing areas (Harmony 2006), and is therefore, not likely to be at variance to this principle (CALM 2006).

Methodology
CALM (2006)
Curry et al. (1994)
GIS Database:
- Threatened Fauna - CALM 30/9/05
Harmony (2006)
Murcox Biological Services (1993)

(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 CALM datasets there are no known records of Declared Rare Flora or Priority flora species within the project area (GIS database).

A search of the CALM Threatened Flora and WA Herbarium databases was undertaken by Harmony Gold between the coordinates 27º02' to 28º24 S and 117º24' to 118º18' E to identify flora species of conservation significance which may potentially occur within the application area. Thirty five flora species of conservation significance were identified as potentially occurring within the search coordinates, however, many of the species with conservation significance occur on landforms that differ strongly from the landforms within the project area (Western Botanical 2006). Following the desktop review, a field assessment was undertaken by the Environmental Officers of Harmony Gold on 24 December 2005 and 18 January 2006. The vegetation and flora was identified in the field, or at the Mt Magnet Gold offices from specimens collected by Harmony staff, and unknown species of flora were collected and sent to Western Botanical for verification (Harmony Gold 2006; Western Botanical 2006).

No Declared Rare Flora or Priority flora species were identified within the proposed clearing area during the flora and vegetation surveys (Western Botanical 2006).

The Priority 3 species *Acacia speckii* was identified on a granite outcrop located approximately 250 m north of the project area. This area falls outside the proposed design areas of the waste dump, pit, ore pad and haulage roads (Western Botanical 2006; K de Roer, Senior Environmental Officer, Mt Magnet Gold, pers. comm., 5 May 2006). *Acacia speckii* is generally located on rocky hills or rises with rocky soils over granite, basalt or dolerite (Florabase 2006). The Britannia Well project area is predominately a level gravely loam plain with little vegetation present. No rises or rocky outcrops are located within the proposed project area (Western Botanical 2006; K de Roer, Senior Environmental Officer, Mt Magnet Gold, pers. comm., 5 May 2006), therefore, *Acacia speckii* is not likely to be present within the project area, or impacted on by the proposal.

The Priority 4 species *Goodenia neogoodenia* has been identified approximately 10 km south-east of the proposed clearing area (GIS database). This species is a prostrate, annual herb with minute flowers and is found on red loam or clay soils near water (Florabase 2006). There are no watercourses or wetlands within the proposed clearing area and only one minor, non-perennial watercourse intercepts the application area (GIS database). This non-perennial watercourse is likely to remain dry for the majority of the year and would likely flow only for a short period after significant rainfall events. In consideration of the habitat requirements for *Goodenia neogoodenia*, the proposal is not likely to impact on this species.

With consideration to the above, the proposal is not likely to be at variance to this principle (CALM 2006).

Methodology
CALM (2006)
Florabase (2006)
GIS Database:
- Declared Rare and Priority Flora List - CALM 01/07/05
- Hydrography, linear - DOE 1/2/04
Harmony (2006)
Western Botanical (2006)

(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 records of Threatened Ecological Communities (TECs) within the area subject to be cleared (GIS database; Cowan 2001). The nearest known TEC is located approximately 190 km south-west of the proposed clearing area (GIS database). The proposal is not likely to be at variance to this principle (CALM

2006).

Methodology CALM (2006)
Cowan (2001)
GIS Database:
- Threatened Ecological Communities - CALM 12/4/05

(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 likely to be at variance to this Principle

The application area falls within the Eastern Murchison Interim Biogeographic Regionalisation for Australia (IBRA) subregion within which approximately 100% of the pre-European vegetation remains (Shepherd et al. 2001; GIS database). This extent is well above the 30% threshold level identified by the EPA in Position Statement No. 2, below which species loss appears to accelerate exponentially at the ecosystem level (EPA 2000).

The vegetation type within the application has been recorded as Beard Vegetation Association 312: Succulent steppe with very open shrubs; very sparse Mulga (*Acacia anuera*) and *Acacia sclerosperma* over saltbush & bluebush (Shepherd et al. 2001; GIS database). According to Shepherd et al. (2001), approximately 100% of the vegetation association remains within the IBRA Eastern Murchison subregion, with 0% held within reserves. The benchmark of 15% representation in conservation reserves has not been met for Beard Vegetation Association 312 (JANIS Forests Criteria 1997).

In consideration to the current extent of pre-European vegetation remaining within the IBRA Eastern Murchison subregion and for Beard Vegetation Association 312 (within the Eastern Murchison subregion), the area proposed to be cleared does not appear to represent a significant remnant of native vegetation, therefore, the proposal is not likely to be at variance to this principle.

	Pre-European area (ha)	Current extent (ha)	Remaining %*	Conservation Status**	% in IUCN Class I-IV reserves
IBRA subregion - Eastern Murchison	21,135,046*	21,135,046*	~100%	Least concern	0.0%
Shire of Coolgardie	No information available				
Beard vegetation association - 312	41,502	41,502	~100%	Least concern	0.0%

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

Methodology Department of Natural Resources and Environment (2002)
EPA (2000)
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00
Harmony (2006)
JANIS Forests Criteria (1997)
Shepherd et al. (2001)
Western Botanical (2006)

(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 may be at variance to this Principle

There are no permanent wetlands or watercourses within the proposed area of clearing (GIS database), however, a minor, non-perennial watercourse intercepts the south-west corner of the application area. Clearing for the proposed mining infrastructure (ore pad, pits and waste dump) does not intercept the non-perennial watercourse in question, therefore the riparian vegetation is not likely to be impacted on by the clearing (Harmony 2006a).

The proposed haul road is designed to cross the non-perennial watercourse approximately 200 m north of the proposed project area. The proponent has advised that the haul road is to be constructed to a maximum width of 15 m, therefore, the impact to native vegetation growing in association with the watercourse is likely to be minimal. Furthermore, aerial photography of the application area shows the riparian vegetation surrounding the watercourse to be relatively sparse (Harmony 2006; Harmony 2006a), therefore, the proposed clearing for the haul road is not likely to have a significant impact on riparian vegetation within the application area. In order to minimise the impact to native vegetation growing in association with the non-perennial watercourse two conditions have been placed on the clearing permit which restrict the level of clearing near and within the watercourse. These are;
1. The Permit Holder shall not clear native vegetation within 50 m of a defined perennial or non-perennial watercourse for any purpose other than for the haul road, and;

2. The Permit Holder shall ensure that the clearing for the haul road shall not exceed 15 m in width, within 50 m of a defined perennial or non-perennial watercourse.

In consideration of the above, the proposed clearing is not likely to have a significant impact on vegetation growing in association with a wetland or watercourse, however, considering that the proposed haul road will intercept the non-perennial watercourse the clearing may be at variance to this principle.

Methodology GIS Database:
- Hydrography, linear - DOE 1/2/04
Harmony (2006)
Harmony (2006a)

(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

Department of Agriculture and Food (2006) advise that interpretation of the Geological Map of Western Australia and available satellite imagery suggests that the proposed clearing areas occur on the Wiluna Land System. This land system occurs over archaean basic rock and is described as having low greenstone hills with occasional laterite breakaways, broad stoney slopes, lower saline stoney plains and broad drainage tracts. The project area has been subjected to more than 100 years of land degradation through historic mining and pastoral activities, and as a result the vegetation is characterised by relatively low densities of shrub varieties and low species richness (Harmony 2006). Sparse Mulga shrubland with patches of halophytic shrubs is dominant vegetation, and the soils are typically shallow (<20 cm deep) red earths and hard pan loams over lateritic caprock or base rock (DAFWA 2006; Harmony 2006).

The Britannia Well project area experiences low average annual rainfall (236 mm/yr) and a high average annual evaporation rate (3200 -3400 mm/yr), and combined with a topographic gradient of approximately 2% it would be expected that there will be little surface flow during normal season rains which would effectively minimise the risk of water erosion (Harmony 2006; GIS database). DAFWA (2006) advise that the erosion risk away from drainage lines/ floors is likely to be low provided reasonable precautions are taken, therefore, the clearing for the proposed open pits, ore pad and waste rock dumps is not likely to be at variance with this principle for water erosion.

The mine haul road traverses several drainage tracts, however, the proponent has advised that the clearing for the proposed haul road will be kept to a maximum width of 15 m, thereby minimising the erosion risk to the vegetation growing in association with the watercourse (Harmony 2006a). DAFWA advise that these watercourses are moderately susceptible to accelerated water erosion where the protective vegetation is removed and water is intercepted and/or concentrated by the road structure. The clearing for the proposed mine haul road may be at variance with this principle for water erosion (DAFWA 2006). In order to minimise the risk of water erosion occurring within the watercourse, two conditions have been placed on the clearing permit:
1. The Permit Holder shall not clear native vegetation within 50 m of a defined perennial or non-perennial watercourse for any purpose other than for the haul road, and;
2. The Permit Holder shall ensure that the clearing for the haul road shall not exceed 15 m in width, within 50 m of a defined perennial or non-perennial watercourse.

There are no permanent wetlands or watercourses within the proposed clearing areas, and given the low rainfall of the area, the clearing of native vegetation is not likely to increase the risk of waterlogging on site. In regard to salinity, the Britannia Well project site is a level gravely plain with little vegetation present (Western Botanical 2006). Depth to groundwater at Britannia Well is approximately 16.5 m and groundwater is of stock quality with a salinity of 4500 mg/L TDS (Harmony 2006). The clearing of native vegetation is not likely to result in a significant watertable rise, or an increase in salinisation either on-site or off-site.

In consideration of the above, the proposal may be at variance to this principle due to the risk of water erosion occurring where the clearing for the proposed haul road intercepts the watercourse.

Methodology DAFWA (2006)
GIS Database:
- Evaporation Isopleths - BOM 09/98
- Topographic Contours, Statewide - DOLA 12/09/02
Harmony (2006)
Harmony (2006a)
Western Botanical (2006)

(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 at variance to this Principle

There are no CALM managed conservation areas within the proposed clearing area. The nearest conservation area is a CALM managed timber reserve which is situated approximately 170 km south-west of the project area (GIS database). Considering the distance between this proposal and the CALM managed timber reserve, the proposed clearing is not at variance to this principle (CALM 2006).

Methodology CALM (2006)
GIS Database:
-CALM Managed Lands and Waters - CALM 1/07/05

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

Comments

Proposal is not likely to be at variance to this Principle

There are no permanent watercourses or water bodies within the vicinity of the application area, however, one minor, non-perennial watercourse intercepts the south-west corner of the application area (GIS database; Harmony 2006). Given that the Mt Magnet area experiences low average annual rainfall (236 mm/yr) and a high average annual evaporation rate (3200 - 3400 mm/yr) (Harmony 2006; GIS database), the watercourse would most likely flow for only short periods after significant rainfall events, and any ponded waters would be likely to evaporate quickly within a normal year. The vegetation surrounding the watercourse is relatively sparse and is not likely to act as a significant buffer, therefore, the clearing of native vegetation is not likely to cause deterioration in the quality of surface water.

The proposed area of clearing is located within 100 m of the Mt Magnet Water Reserve (GIS database). Depth to groundwater has been measured at Britannia Well (located approximately 250 m south of the Britannia Well open pit) at 16.5 m below the well cover, and groundwater is of stock quality with a salinity of 4500 mg/L Total Dissolved Solids (Harmony 2006). Given the low average annual rainfall and high evaporation rate of the Mt Magnet area, the clearing of 30 ha of low density shrub vegetation is not likely to significantly increase groundwater recharge. The area of native vegetation to be cleared is relatively small and not likely to impact on regional groundwater considering the size of the regional Yilgarn-Southwest groundwater province (24,601,260 ha), and the extent of native vegetation remaining in the Murchison bioregion (~100%) (GIS database; Shepherd et al. 2001).

The proposal raises no water quality issues, therefore, is not likely to be at variance to this principle.

Methodology GIS Database:
- Evaporation Isopleths - BOM 09/98
- Groundwater Provinces - WRC 98
- Hydrography, linear - DOE 1/2/04
- Lakes, 1M - GA 01/06/00
- Rivers, 1M - GA 01/06/00

Harmony (2006)
Shepherd et al. (2001)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments

Proposal is not likely to be at variance to this Principle

The proposed clearing areas are not in association with any wetlands or perennial watercourses (GIS database). Rainfall in the Mt Magnet area is unreliable and highly variable with an average annual rainfall of 236 mm/yr, and an average annual evaporation rate of approximately 3200-3400 mm/yr (Harmony 2006; GIS database). The landscape of the project area is characterised by a low topographic gradient (approximately 2%) with broad drainage tracts which would likely disperse floodwaters following significant rainfall events thereby reducing peak flood heights. The numerous non-perennial watercourses in the region are responsible for dispersing floodwaters into the many salt lake systems which are scattered across the landscape (GIS database). Considering the low gradient and broad drainage tracts of the area, it is unlikely that the clearing of 30 ha of native vegetation will form a catchment area sufficiently large enough to cause, or increase the incidence of flooding.

With consideration to the above, the proposal is not likely to be at variance to this principle.

Methodology GIS Database:
- Evaporation Isopleths - BOM 09/98
- Hydrography, linear - DOE 1/2/04

Harmony (2006)

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

Comments

The proposal is located within 1 km of the Mt Magnet Water Reserve. The Department of Water (DoW) were consulted regarding the proposal and advised that DoW are satisfied that the potential impacts on the water reserve can be managed under existing licences, therefore, the project does not warrant referral to the EPA (A Bishop, Environmental Officer, DoIR, pers. comm., 25 May 2006).

There is a native title claim over the area under application; WC96/098 (GIS database). This claim has been registered with the National Native Title Tribunal on behalf of Badimia claimant group. However, the mining

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 no sites of aboriginal significance within the proposed area to be cleared (GIS database).

Harmony Gold's mining leases M58/81 and M58/186 have a current groundwater licence; GWL 151513, for the purpose of camp, dewatering, dust suppression and mining granted in accordance with the *Rights in Water and Irrigation Act 1914*. Harmony Mt Magnet Gold have confirmed that mining leases M58/233, M58/119, M58/30 and M58/179 are part of the same mine site and should be included on the licence. DoE requested Harmony Gold to submit an application to amend the licence (DoE 2006).

Harmony Mt Magnet Gold's mining leases M58/233, M58/119, M58/30, M58/179, M58/81 and M58/186 have a current operating licence; 5529/8, granted in accordance with the *Environmental Protection Act 1986*. The licence is due to expire in September 2006 (DoE 2006).

Harmony Mt Magnet Gold has submitted a Mining Proposal for the Britannia Well project (A Bishop, Environmental Officer, DoIR, pers. comm., 21 February 2006).

No submissions or objections have been received from direct interest parties.

Methodology DoE (2006)
GIS Database:
- Native Title Claims - DLI 7/11/05
- Aboriginal Sites of Significance - DIA 28/02/03

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mineral Production	Mechanical Removal	30	**Grant**	The clearing principles have been addressed and the proposed clearing is not at variance with principle h. The proposed clearing is not likely to be at variance with principles a, b, c, d, e, i and j. The proposed clearing may be at variance with principle f, as the clearing for the proposed haul road intercepts a non-perennial watercourse. The proposed clearing may also be at variance with principle g, as DAFWA has advised that the land units across which the haul road intercepts the watercourse may be moderately susceptible to accelerated water erosion once the protective vegetation is removed. The assessing officer recommends that the permit be granted with the following conditions. 1. The Permit Holder shall ensure that the clearing for the haul road shall not exceed 15 m in width, within 50 m of a watercourse. 2. The Permit Holder shall not clear native vegetation within 50 m of a defined perennial or non-perennial watercourse, for any purpose other than haul road construction. 3. In this Permit, a watercourse means; a) any river, creek, stream or brook in which water flows; b) any collection of water (including a reservoir) into, through or out of which any thing coming within paragraph (a) flows; c) any place where water flows that is prescribed by local by-laws to be a watercourse, and includes the bed and banks of any thing referred to in paragraph (a), (b) or (c). d) a flow or collection of water even though it is only intermittent or occasional; e) a river, creek, stream or brook includes a conduit that wholly or partially diverts it from its natural course and forms part of the river, creek, stream or brook. f) it is immaterial that a river, creek, stream or brook or a natural collection of water may have been artificially improved or altered. 4. The Permit Holder shall record the following for each instance of clearing: a) the location of where the clearing occurred, expressed as grid coordinates using

the Geocentric Datum of Australia 1994 coordinate system;
b) the size of the area cleared in hectares, and;
c) the dates on which the area was cleared.

5. The Permit Holder shall provide a report to the Director, Environment, Department of Industry and Resources by 15 August each year, setting out the records required under condition 4 of this permit in relation to clearing carried out between 1 January and 31 December of the previous year. The Permit Holder shall submit a report each year until the clearing under this permit has been completed.

5. References

CALM (2006). Land clearing proposal advice. Advice to Native Vegetation Assessor, Native Vegetation Assessment Branch, Department of Industry and Resources. Department of Conservation and Land Management. Perth, Western Australia.

Cowan, M. (2001). Murchison 1 (MUR1- East Murchison subregion) in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002'. Report published by the Department of Conservation and Land Management, Perth, Western Australia.

Curry, P.H., Payne, A.L., Leighton, K.A., Henning, P. and Blood, D.A. (1994). An Inventory and Condition Survey of the Murchison River Catchment, Western Australia. Department of Agriculture WA. Technical Bulletin No. 84.

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Florabase (2006). The Western Australia Flora, A search for *Goodenia neogoodenia*, Western Australia Herbarium, Department of Conservation and Land Management, Perth, viewed 9 May 2006, <http://florabase.calm.wa.gov.au.html>.

Harmony Mt Magnet Gold NL (2006). Britannia Open Pit Notice of Intent. Prepared by Karen de Roer, Senior Environmental Officer, Harmony Gold, March 2006.

Harmony Mt Magnet Gold NL (2006a). Amendment to Britannia Open Pit Notice of Intent. Prepared by Ferdia Somesan, Environmental Officer, Harmony Gold, Amended May 2006.

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

Murcox Biological Services (1993). Report on a Faunal Survey at the Hill 50 Gold Mine NL, Mt Magnet.

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 (updated 2005).

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6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
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.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
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.