



1. Application details

1.1. Permit application details

Permit application No.: 812/1

Permit type: Area Permit

1.2. Proponent details

Proponent's name: Oxiana Golden Grove Pty Ltd

1.3. Property details

Property: M59/227

Local Government Area: Shire Of Yalgoo

Colloquial name: Golden Grove

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.83		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 420: Shrublands; Bowgada and Jam scrub	Clearing of 1.83 ha is required for a extension of the existing borrow pit on M59/227 to access clay/white saprolite to complete the Stage 6 lift of Tailings Storage Facility 2 (TSF2) (Oxiana Golden Grove, 2005).	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	The condition of the vegetation was determined through review of the Flora and Vegetation Survey conducted in 1996 (Mattiske Consulting, 1996) and aerial photography provided with the application (Oxiana Golden Grove, 2005). The application area is situated immediately adjacent to the existing borrow pit, and is likely to have suffered some edge effects from this. As a result, it is likely to be in very good condition, according to the condition scale of Keighery (1994).
(Hopkins et al., 2001; Shepherd et al., 2001)	The targeted area is located at the base of a laterite capped breakaway (Oxiana Golden Grove, 2005). The vegetation of the area was mapped by Mattiske Consulting between 24 and 28 October 1996. The vegetation association of the borrow pit extension area is categorised as Association 13 (Brodalka, 2005). This is Open Heath of <i>Ptilotus obovatus</i> , <i>Gunniopsis quadrifida</i> and <i>Frankenia setosa</i> with emergent <i>Acacia aulacophylla</i> over annuals dominated by <i>Eremophyllum ramosum</i> subsp <i>ramosum</i> and <i>Podolepis capillaris</i> (Mattiske Consulting, 1996). At the time of the survey, the litter cover was 5-10% consisting of twigs and leaves, with 5-20% bare ground.		Mattiske Consulting, 1996 Oxiana Golden Grove, 2005
	Javier Brodalka, Environment and Community Relations Manager, Oxiana Limited (pers comm, 27/09/2005) Oxiana Golden Grove, 2005 Mattiske Consulting, 1996		

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 to be cleared constitutes 0.00025 % of the current extent of Beard vegetation association 420: Shrublands; Bowgada and Jam scrub (see Principle e and Shepherd et al., 2001). Due to the close proximity of the site to the present borrow pit, and likely edge effects of works carried out within the borrow pit and its surrounds, it is likely that the vegetation of the application area is less biodiverse than other vegetation of the same association.

The application area has previously undergone adequate assessment at the original NOI stage and the small

scale extension of the existing borrow pit is unlikely to cause any new significant impacts to the biodiversity or the area (CALM, 2005). On this basis, CALM advises that this proposal is unlikely to be at variance to this clearing principle.

Methodology CALM, 2005
Shepherd et al., 2001

GIS Databases:
Western Australia ETM 25m 543 - AGO 04

(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

Previous fauna surveys carried out in January 1997 indicate that there are no rare or endangered species in the general area (Normandy Golden Grove Operations, 1998).

The survey from 1997 notes that clay outwash plains (in which the application area is located) provide possible breeding habitat for Bush Stone-curlews (*Burhinus grallarius*, Priority 4) and the Spotted Nightjar. The nearby breakaway has also been identified as possible habitat for the Woma Python (*Aspidites ramsayi*, Other Specially Protected Fauna) and South Western Carpet Python (*Morelia spilota imbricata*, Other Specially Protected Fauna).

While the clay outwash plain is a potential habitat for Bush Stone-curlews and the Spotted Nightjar, the clearing area is small relative to the extent of this habitat type, and therefore is not likely to significantly impact the habitat type.

The application area has previously undergone adequate assessment at the original NOI stage and the small scale extension of the existing borrow pit is unlikely to cause any new significant impacts to the biodiversity or the area (CALM, 2005). On this basis, CALM advises that this proposal is unlikely to be at variance to this clearing principle.

Methodology Normandy Golden Grove Operations, 1998
CALM, 2005

(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

No Declared Rare Flora are known to be located within a 10km radius of the application area (Declared Rare and Priority Flora List - CALM 01/07/05). There are no known Priority Flora located within the application area. However, the following Priority 1 species have been recorded approximately 5km south of the application area:

- *Micromyrtus* sp. Warriedar (S. Patrick 1879A) is a member of the Myrtaceae. Its preferred habitat is granite hills (Western Australian Herbarium, 1998-2005); and
- *Genus* sp. Yalgoo (J.M. Ward s.n. 11/7/1999) is a member of the Rhamnaceae. Its preferred habitat is red-brown clay loam or brown rocky loam on the summit of steep sided hills or ridges.

The hilly habitat preferred by these species infers that they are not likely to be located within the application area which is located at the base of a laterite capped breakaway, on a white clay outwash plain.

Two other species have been historically identified by CALM and Matiske Consulting as being a concern within the immediate vicinity of the Gossan Hill project (Matiske Consulting, 1996; Department of Conservation and Land Management, 1997). These are *Grevillea globosa* and *Prostanthera magnifica*. The latter has since been taken off the Priority Flora list.

- Matiske Consulting located *Grevillea globosa*, a Priority 3 species during their survey for the Gossan Hill project, but it was not located within the area under the application (Matiske Consulting, 1996). The preferred habitat of this species is red loams and yellow sands (Western Australian Herbarium, 1998-2005), and three populations were identified in two vegetation associations supported by these soil types during the survey in 1996 (Matiske Consulting, 1996)
- CALM's Priority Flora List has not been updated with the data from the Matiske Consulting survey, as it indicates that *Grevillea globosa* is not known to occur within a 60km radius of the application area (Declared Rare and Priority Flora List - CALM 01/07/05).

The application area has previously undergone adequate assessment at the original NOI stage and the small scale extension of the existing borrow pit is unlikely to cause any new significant impacts to the biodiversity or the area (CALM, 2005). On this basis, CALM advises that this proposal is unlikely to be at variance to this clearing principle.

Methodology CALM, 2005
Western Australian Herbarium, 1998-2005
Department of Conservation and Land Management, 1997

Mattiske Consulting, 1996

GIS databases:

Declared Rare and Priority Flora List - CALM 01/07/05

(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 records of Threatened Ecological Communities (TEC) or Threatened Plant Communities (TPC) within the local area (50 km radius).

The application area has previously undergone adequate assessment at the original NOI stage and the small scale extension of the existing borrow pit is unlikely to cause any new significant impacts to the biodiversity or the area (CALM, 2005). On this basis, CALM advises that this proposal is unlikely to be at variance to this clearing principle.

Methodology CALM, 2005

GIS databases:

Threatened Ecological Communities - CALM 12/4/05

Threatened Plant Communities - DEP 06/95

(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 vegetation association (420) mapped by Beard is well represented and has over 85% of its Pre-European extent remaining (Shepherd et al., 2001). This association is therefore of 'least concern' for biodiversity conservation.

	Pre-European (ha)*	Current extent (ha)*	Remaining (%)*	Conservation status**	% of current extent in reserves/ CALM managed lands
IBRA Bioregion - Yalgoo	4,293,913 *	4,244,964 *	98.9%	Least concern	
Beard vegetation association - 420	844,073	741,110	87.8 %	Least concern	3.1 %

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002). Least concern means that >50 % of the pre-European extent exists and subject to little or no degradation over a majority of this area.

The application area has previously undergone adequate assessment at the original NOI stage and the small scale extension of the existing borrow pit is unlikely to cause any new significant impacts to the biodiversity or the area (CALM, 2005). On this basis, CALM advises that this proposal is unlikely to be at variance to this clearing principle.

Methodology CALM, 2005
Shepherd et al., 2001
Hopkins et al., 2001

GIS databases:

- Pre-European Vegetation - DA 01/01

- Interim Biogeographic Regionalisation of Australia - EA 18/10/00

- EPA Position Paper No 2 Agricultural Region - DEP 12/00

(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 not likely to be at variance to this Principle

The application area is located at the base of a laterite capped breakaway (Oxiana Golden Grove, 2005). The area itself is relatively flat, and drainage is poorly defined, although the general topography tends to drain in a southeasterly direction (Normandy Golden Grove Operations, 1998).

There are no defined rivers or drainage lines in the area of interest. Rather, drainage by sheet flow is likely to occur during the infrequent major rainfall events (Brodalka, 2005).

Any runoff will be diverted around the pit area to prevent disturbance of the surface drainage from the pit's operations (Brodalka, 2005; Normandy Golden Grove Operations, 1998). Therefore, the proposal is not likely to be at variance to this principle.

Methodology Normandy Golden Grove Operations (1998)
Oxiana Golden Grove (2005)
Javier Brodalka, Environment and Community Relations Manager, Oxiana Limited (pers comm, 08/09/2005)

GIS databases:
Rivers, 1M - GA 01/06/00
Hydrography, linear (hierarchy) - DOE 13/4/05
Topographic Contours, Statewide - DOLA 12/09/02

(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 soil of the application area is described as a white clayey sand with angular pebbles ranging from 1-20cm in size (Mattiske Consulting, 1996). The area is at the base of a laterite capped breakaway (Oxiana Golden Grove, 2005), and as such runoff generated from sporadic rainfall events will flow down from the breakaway across the clay outwash plains.

The site works will require removal of the vegetation and topsoil, and both of these components will be stockpiled and used in later rehabilitation (Oxiana Golden Grove, 2005).

Potential sources of soil erosion from exploration activities within the area include:

- Wind and water erosion of rehabilitated surfaces; and
- Wind and water erosion during the life of the borrow pit.

The following are mitigation measures which the operator has confirmed will be carried out to manage these aspects of land degradation are (Brodalka, 2005; Normandy Golden Grove Operations, 1998). These commitments are documented in the existing NOI for the Borrow Pit (DoIR ref:2712):

- Dust suppression measures will be implemented to meet occupational health and safety standards. Within the borrow pit, watering will be done to ensure that the material is at optimum moisture content and it is expected that this practise will minimise the generation of nuisance dust.
- At the completion of mining, the borrow pit will be rehabilitated. Pit batters will be reduced and the stockpiled topsoil will be respread over the pit batters and floor in a stratum sequence. The entire area will be deep ripped to assist infiltration and reduce the chances of erosion. The pit batters will be reduced to an angle of < 1:5 to ensure that erosion is minimised. Monitoring of the site will be undertaken to ensure that the above strategies have been successful.

Considering the size of the application area, and the proposed management measures, the proposal is not likely to be at variance to this principle.

Methodology Javier Brodalka, Environment and Community Relations Manager, Oxiana Limited (pers comm, 08/09/2005)
Oxiana Golden Grove, 2005
Normandy Golden Grove Operations, 1998
Mattiske Consulting, 1996

GIS databases:
Topographic Contours, Statewide - DOLA 12/09/02
Hydrography, linear (hierarchy) - DOE 13/4/05

(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 following pastoral leases which are vested to CALM for the purposes of nature conservation under section 33(2) of the *Conservation and Land Management Act 1984*, are located within a 50km radius of the application:

- Ex Warriedar (Pastoral Lease No 1123);
- Ex Burnerbinmah (Pastoral Lease No 535);
- Ex Lochada (Pastoral Lease No 424); and
- Ex Karara (Pastoral Lease No 886).

However considering the scale of the proposal and proximity to these CALM Managed areas the proposal is unlikely to be at variance with this principle.

Methodology CALM, 2005

GIS databases:
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**
The groundwater in the Golden Grove area is generally of potable quality (between 500 and 1500 mg/L TDS) (BSD Consultants, 1998). Typical groundwater levels in the areas of mining operations range from 20m below ground level to greater than 100 m below ground level. The operator has confirmed that groundwater will not be intercepted (Brodalka, 2005). Furthermore, the clay/white saprolite has a low permeability, and impacts of surface activity on the groundwater quality is unlikely.

There are no defined surface water channels or bodies within or adjacent to the application area (Brodalka, 2005). Runoff occurs as sheet flow during the infrequent major rainfall events, and to prevent disturbance of surface drainage, runoff is diverted around the pit area. The clearing will therefore not impact on the quality of surface water.

Methodology BSD Consultants, 1998
Javier Brodalka, Environment and Community Relations Manager, Oxiana Limited (pers comm, 08/09/2005)

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

Comments **Proposal is not at variance to this Principle**
Flooding impacts are unlikely to occur as a result of the proposed clearing due to its size relative to the surrounding vegetated shrublands.

Furthermore, drainage occurs as sheet flow in the area (Brodalka, 2005), and runoff is diverted around the pit area to prevent disturbance of surface drainage from the pit's operation (Normandy Golden Grove Operations, 1998).

Methodology (Normandy Golden Grove Operations, 1998)
Javier Brodalka, Environment and Community Relations Manager, Oxiana Limited (pers comm, 08/09/2005)

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

Comments
There are no sites on the Register of Aboriginal Sites within the application area.
There are no Native Title Claims over the application area.
Oxiana Golden Grove's lease M59/227 has a current groundwater licence GWL103574 for the purpose of camp, dewatering, dust suppression and mining, granted in accordance with the *Rights in Water and Irrigation Act 1914* (DoE, 2005). As the proposed clearing activity at the site falls within the purpose of mining, the groundwater licence requirements will apply.
Oxiana Golden Grove's lease M59/227 has a current operating licence 5175/7 granted in accordance with the *Environmental Protection Act 1986* (DoE, 2005). The proposed clearing is not at variance to this licence, and no amendment to the licence will be required for extension of the borrow pit.
No Works Approval is required for the extension of the borrow pit (DoE, 2005).

Methodology DoE, 2005
GIS databases:
- Aboriginal Sites of Significance - DIA 04/07/02
- Native Title Claims - DLI 19/12/04

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision Comment / recommendation
Mineral Production	Mechanical Removal	1.83	Grant It is intended that the application area be used for extension of a borrow pit in order to complete the final lift of Tailings Storage Facility 2 (TSF2). The site works will require removal of the vegetation and topsoil, and both of these components will be stockpiled and used in later rehabilitation. The underlying clay/white saprolite will be used at TSF2.

The assessable criteria have been addressed and the clearing as proposed is not likely to be at variance to Principles a, b, c, d, e, f, g, h and i. The proposal is not at variance to Principle j.

Therefore, the assessing officer recommends that a clearing permit be granted.

5. References

- BSD Consultants (1998). *Assessment Report: Addendum - Gossan Hill Underground Project M59/195, M59/227 and M59/3. Notice of Intent*. BSD Consultants, Perth.
- CALM advice: CALM (2005). *Oxiana Golden Grove, Borrow pit extension CALM Advice*. Department of Conservation and Land Management, Western Australia. DOIR ref 259.KF
- Department of Conservation and Land Management (1997). Letter dated 30 September 1997. *Priority Flora Species - Gossan Hill Project*. Department of Conservation and Land Management, Perth.
- Department of Conservation and Land Management (2005). *Significant Fauna 2005*. Department of Conservation and Land Management, Perth.
- 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.
- DoE advice: DoE (2005). *DoE licence checks*. Advice to Kiera Foster, Department of Industry and Resources. Department of Environment, Western Australia. DOIR ref 242.KF
- EPA (2000) *Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2*. December 2000. Environmental Protection Authority.
- Hopkins, A.J.M., Beeston, G.R. and Harvey J.M. (2001) *A database on the vegetation of Western Australia. Stage 1*. CALMScience after J. S. Beard, late 1960's to early 1980's *Vegetation Survey of Western Australia*, UWA Press.
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske Consulting (1996). *Flora and Vegetation of Golden Grove Project, Murchison Zinc Company Pty Ltd. Yalgoo*. Report No. CJC003/257/96. Mattiske Consulting Services, Perth.
- Normandy Golden Grove Operations (1998). *Borrow Pit for No. 2 Tailings Dam Construction Project. Notice of Intent*. Normandy Golden Grove Operations, Geraldton.
- Oxiana Golden Grove (2005). Letter dated 28 July 2005. *Area Permit (C1) Application for 1.83ha on M59/227*. Oxiana Limited - Golden Grove, Geraldton.
- 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.
- Western Australian Herbarium (1998y2005). *FloraBase - The Western Australian Flora*. Department of Conservation and Land Management. <http://florabase.calm.wa.gov.au/>. Accessed 7 September 2005.

6. Acronyms:

CALM	Department of Conservation and Land Management, Western 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.
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

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.
- 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.

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.

{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} :-

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.