Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2107/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: **Worsley Alumina Pty Ltd**

1.3. Property details

Property: Lot 5314 on Plan 220209
State Agreement Act, Mineral Lease ML 258 SA (AM 70/258)
Local Government Area: Shire Of Collie & Shire Of Harvey
Colloquial name: Contractor yard and earth moving vehicle park-up

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
6.37		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
Vegetation within the application area has been mapped at a 1:250,000 scale as Beard vegetation association 3, and is described as: Medium forest; jarrah-marri (Shepherd *et al.*, 2001).

The application area has been mapped by Mattiske Consulting Pty Ltd as the following vegetation types (Mattiske, 1999):

S – Open forest of *Eucalyptus marginata – Banksia grandis – Allocasurina fraseriana* with scattered understorey, including *Adenanthos barbiger, Leucopogen capitellatus* and *Styphelia tenuiflora.*

Q - Open forest of *Eucalyptus marginate – Corymbia calophylla – Eucalyptus patens* on lower slopes with mixed understorey species, including *Trymalium floribundum, Acacia extensa* and *Phyllanthus calycinus*.

Clearing Description
Worsley Alumina Pty Ltd (hereafter referred to as Worsley) has applied to clear up to 6.37 hectares of native vegetation for the installation of a contractor's yard and earth moving machinery park-up. The area will be cleared using a bulldozer and vegetation will be mulched and used for revegetation projects.

The application area is located approximately 14 kilometres north-west of Collie (GIS Database). The Worsley Refinery Lease Area is located on the Darling Ranges, north-west of Collie and on the fringes of the Collie Basin.

Vegetation Condition
Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).

To

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994).

Comment
The vegetation condition is based on the Keighery (1994) vegetation condition scale, from aerial photography and an assessment provided by Worsley.

The application area is located within the active Worsley Alumina Refinery Lease Area (GIS Database). The vegetation under application has been previously cleared and revegetated. The area was initially revegetated for the purpose of erosion control and to control dust.

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 Jarrah Forest Bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) and the Northern Jarrah Forest Subregion (GIS Database). The biodiversity values of the subregion were assessed by Williams and Mitchell (2001). The vegetation of the subregion comprises of Jarrah–Marri forest in the west with Bullich and Blackbutt in the valleys, grading to Wandoo and Marri woodlands in the east with Powderbark on breakaways. There are extensive but localised sand sheets with Banksia low woodlands. Heath is found on granite rocks and as a common understorey of forests and woodlands in the north and east. The majority of the diversity in the communities occurs on the lower slopes or near granite soils where there are rapid changes in site conditions (Williams and Mitchell, 2001).

The application area is located within the Worsley Alumina Refinery Lease Area (the 'project area') which has been previously disturbed by mining activities (GIS Database). Vegetation within the application area has been previously cleared and is currently revegetated vegetation. Mattiske Consulting carried out a vegetation survey of the project area in 1998 which included the application area. A total of 266 vascular plant species from 52 plant families and seventeen site vegetation types were recorded within the survey area (Mattiske, 1999). Mattiske (1999) identified two vegetation types within the application area. These were:

- Vegetation type S - Open forest of *Eucalyptus marginata – Banksia grandis – Allocasurina fraseriana* with scattered understorey, including *Adenanthos barbiger, Leucopogen capitellatus* and *Styphelia tenuiflori,* and;
- Vegetation type Q - Open forest of *Eucalyptus marginate – Corymbia calophylla – Eucalyptus patens* on lower slopes with mixed understorey species, including *Trymalium floribundum, Acacia extensa* and *Phyllanthus calycinus*.

A total of 156 and 83 plant species were recorded within vegetation type S and Q respectively (Mattiske 1999). Of the seventeen site vegetation types identified within the project area, eight vegetation types had species counts less than vegetation type Q. Given the high number of plant species that have been identified within the vegetation type S and Q, and especially for vegetation type S, the application area is likely to contain a high level of biological diversity.

Mattiske (1999) vegetation mapping and assessment of more recent aerial photography indicates that vegetation type S is well represented throughout the project area, whilst vegetation type Q is well represented on the lower slopes of the deeply incised valleys that border a nearby water reservoir. Mattiske (1999) reports that both vegetation type S and Q have a widespread distribution within the Northern Jarrah Forest subregion. Given the high diversity of the vegetation within the application area, the proposed clearing may have some impact on an area of native vegetation which displays a higher degree of biodiversity than other vegetation types in the local area.

The proponent has advised that *Phytophthora cinnamomi* (dieback) occurs within the project area, and that the application area is considered to be infected with dieback. Dieback mapping of the project area shows that there are only small isolated dieback free areas remaining with the project area (Field View Nominees, 1997). Dieback is widespread throughout the south-west of Western Australia and impacts on many native plants including Jarrah, Banksias, Grasstrees (Xanthorrhoea), Hibbertias, Dryandras and Hakeas (Dieback Working Group, 2000). Dieback can have a significant impact on the biological diversity of native vegetation communities since some native plant species are particularly vulnerable to dieback infection. Dieback is easily spread through surface and sub-surface water flows, however, human activities such as earthmoving and vehicular movements are the main mechanisms through which dieback can be spread (Dieback Working Group, 2000).

Dieback mapping indicates that the nearest dieback free area is located approximately 1.6 kilometres west of the application area (Field View Nominees, 1997). Topographic contours show that this dieback free area is located upslope from the application area (GIS Database), therefore, is unlikely to be impacted on by any increased surface or groundwater flows which may occur as a result of the proposed clearing. The vegetation surrounding and downstream of the application area is considered to be infected with dieback (Field View Nominees, 1997). Worsley has established and adheres to a Forest Hygiene Management Plan to ensure that activities conducted by Worsley and its contractors do not contribute to the spread of dieback. In order to minimise the risk of vehicles or clearing equipment spreading dieback off-site, the Assessing Officer recommends that should the clearing permit be granted a condition be placed on the permit to ensure that all vehicles are cleaned down on exit from the application area.

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

Methodology

Dieback Working Group (2000)
Field View Nominees (1997)
Mattiske (1999)
Williams and Mitchell (2001)
GIS Database:
- Collie 50cm Orthomosaic - DLI04
- Interim Biogeographic Regionalisation of Australia (regions)
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00
- Topographic Contours, Statewide

(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 the Environmental Protection Authority (EPA) (1996), fauna species of particular conservation significance that have previously been recorded near the application area include:

- The Chuditch (*Dasyurus geoffroii)* (Schedule 1, fauna that is rare or likely to become extinct, '*Wildlife Conservation (Specially Protected Fauna) Notice, 2006*')

- The Carpet Python (*Morelia spilota imbricata)* (Schedule 4, other specially protected fauna, '*Wildlife Conservation (Specially Protected Fauna) Notice, 2006'*))
- The Peregrine Falcon (*Falco peregrinus)* (Schedule 4 - Fauna that is in need of special protection, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*)
- The Carnaby's Black Cockatoo (*Calyptorhynchus latirostris)* (Schedule 1, fauna that is rare or likely to become extinct, *'Wildlife Conservation (Specially Protected Fauna) Notice, 2006'*)
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii)* (Schedule 1, fauna that is rare or likely to become extinct, '*Wildlife Conservation (Specially Protected Fauna) Notice, 2006*' and Listed as Vulnerable, under the *Environmental Protection and Biodiversity Conservation Act 1999*).

Chuditch are predominantly located throughout the Jarrah forest and mixed Karri/Marri/Jarrah forest of southwest Western Australia (Orell & Morris, 1994). Chuditch are found in a wide range of habitats, including woodlands, dry sclerophyll forests, riparian vegetation, beaches and deserts. However, it has been known to show preference for woodland and mallee habitats (Orell & Morris, 1994). Some of the threats facing the Chuditch are habitat alteration, competition for food, predation from cats and foxes, hunting and poisoning (Orell & Morris, 1994). In certain areas of the Jarrah Forest where foxes are not controlled, male chuditch have a home range of approximately 15 square kilometres, whilst females have a home range of approximately 3-4 square kilometres (Orell & Morris, 1994). Chuditch are known to occupy hollow logs and burrows, and have also been recorded in tree hollows and cavities. Suitable hollow or burrow entrance for the Chuditch is often at least 30 centimetres in diameter (Orell & Morris, 1994). Tree hollows generally take a long time to form and in particular may only occur in large trees which are approximately 100-150 years old (DEC NSW, 2004). The vegetation within the application area has previously been cleared and the current vegetation is regrowth which is approximately 15-20 years old (Worsley, 2008). As a result, the trees within the application area are not likely to be of sufficient age to have formed hollows of suitable size to provide habitat for the Chuditch. Given the large home range of the Chuditch compared to small size of the application area and the lack of suitable nesting dens, the proposed clearing of 6.37 hectares of native vegetation is unlikely to impact on significant habitat for the Chuditch.

The Carpet Python (western subspecies) inhabits temperate climatic areas with good winter rains and dry summers, and has been recorded in semi-arid coastal and inland habitats, Banksia woodlands, Eucalypt woodlands and grasslands (WA Museum, 2003). The Carpet Python subspecies is ecologically flexible and tends to adapt to whatever habitats are available (Pearson *et al*., 2005). Some of the vegetation proposed to be cleared may be suitable habitat for the python species. However, given the Carpet Pythons broad range and ability to utilise a wide range of habitats, the vegetation within the application is unlikely to be considered as significant habitat for this species.

The Peregrine Falcon is a wide ranging bird that has little habitat specificity apart from an affinity with cliffs, tall trees for nesting and water (Pizzey and Knight, 1997). The habitat within the application area is widespread in the local area. Given the lack of cliffs, tall trees or perennial watercourses within the project area, the proposed clearing is unlikely to impact on significant habitat for the Peregrine Falcon.

The Carnaby's Black Cockatoo and Baudin's Black Cockatoo nest in hollows of large eucalypts, usually Salmon Gum and Wandoo (Pizzey, G. & Knight, F. 1997). The vegetation within the proposed clearing area has previously been cleared and the current vegetation is approximately 15-20 years old (Worsley, 2007). The vegetation within the application area is unlikely to be of suitable age to provide appropriate nesting habitat for either the Carnaby's Black Cockatoo or the Baudin's Black Cockatoo. There are large areas throughout the local area that are of suitable foraging habitat for these species. It is unlikely that the vegetation within the application would be regarded as significant habitat for either the Carnaby's Black Cockatoo or Baudin's Black Cockatoo.

The vegetation within the application area has been previously cleared and since revegetated (Worsley, 2007). The area is located immediately adjacent to a heavily disturbed area (GIS Database), and as a result the habitat value of the application area is likely to have been reduced. Analysis of aerial photography shows that the vegetation proposed to be cleared is a minor portion of an area of the Jarrah Forest that remains uncleared. The habitat types within the application area are likely to be well represented and of higher value in the surrounding areas. The proposed clearing is unlikely to impact on significant habitat for fauna species indigenous to Western Australia.

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

Methodology

DEC NSW (2004)
Environmental Protection Authority (1996)
Orell & Morris (1994)
Pearson *et al*. (2005)
Pizzey & Knight (1997)
Shepherd *et al.* (2001)
Worsley (2007)
GIS Database:
- Threatened Fauna - CALM 30/9/05
- Collie 50cm Orthomosaic - DLI04

(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

There are no known records of Declared Rare Flora (DRF) within a five kilometre radius of the application area (GIS Database).

Mattiske Consulting Pty Ltd (Mattiske, 1999) was commissioned to undertake botanical studies on the uncleared areas of the Worsley Refinery Lease Area for Worsley Alumina Pty Ltd during the spring and summer months of 1998. The survey included the clearing application area.

No Declared Rare Flora species gazetted under the *Wildlife Conservation Act 1950* were located on the Worsley Refinery Lease area, however, two Priority species were located, namely *Pultenaea* skinneri (P4) and *Hibbertia silvestris* (Mattiske 1999).

Pultenaea skinneri was recorded at four sites and was restricted to the valley floors and three site-vegetation types within the southern section of the project area. *Pultenaea skinneri* was recorded within site vegetation type D (Open forest of *Eucalyptus marginata* – *Corymbia calophylla* – on lower slopes with mixed low understorey species, including *Baeckea camphorosmae* and *Acacia extensa*) which was identified by Mattiske (1999) as the vegetation type within the application area. A Priority species distribution map produced by Mattiske (1999) shows that no populations of *Pultenaea skinneri* were recorded within the clearing application area during the flora and vegetation survey. The closest population of *Pultenaea skinneri* was recorded approximately two kilometres south-east of the application area within site vegetation type SW (Open forest of *Eucalyptus marginata* – *Corymbia calophylla* – *Banksia grandis* with scattered understorey, including *Adenanthos bargiger, Hypocalymma angustifolium* and *Styphelia tenuiflora* on lower to mid slopes with moist loam gravely soils) (Mattiske, 1999). This species is known to occur in three separate bioregions and has been recorded from Collie, Binningup and Boyanup (Florabase, 2008; Mattiske, 1999). Given the distance separating the application area and the nearest recorded population of *Pultenaea skinneri,* the proposed clearing of 6.37 hectares is unlikely to impact on this species.

Hibbertia silvestris was recorded at 39 recording sites and within nine site-vegetation types, therefore, is not restricted in occurrence within the survey area (Mattiske, 1999). *Hibbertia silvestris* was not recorded within the application area, nor was it recorded within the vegetation type associated with the application area – vegetation type D (Mattiske, 1999). This species is known to occur from the Waroona, Collie, Barlee Brook, Glenoran, Dickson, Dwellingup and Harvey River valley systems (Mattiske, 1999). Mattiske has recorded *Hibbertia silvestris* in a range of locations in the central and northern Jarrah Forest in recent years and recommended that the conservation status of this priority species requires review (Mattiske, 1999). The Assessing Officer carried out a search for *Hibbertia silvestris* on FloraBase on 7 January 2008 which noted that the conservation status of the species has been altered to Not Threatened (FloraBase, 2008).

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

Methodology

Florabase (2008)
Mattiske (1999)
GIS Database:
- Declared Rare and Priority Flora List

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments

Proposal is not likely to be at variance to this Principle

A search of available databases reveals that there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The closet known TEC is located approximately 26 kilometres north-west of the application area (GIS Database). The vegetation communities described by Mattiske (1999) were not identified as a TEC. Given the distance from the application area to the nearest TEC, the proposed clearing of 6.37 hectares of vegetation is unlikely to impact on the conservation of the TEC listed above.

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

Methodology

Mattiske (1999)
GIS Database:
- Threatened Ecological Communities CALM 12/04/05

(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 is located within the Northern Jarrah Forest subregion in which approximately 58.8% of

the pre-European vegetation remains (Shepherd et al. 2001; GIS Database).

The vegetation proposed to be cleared has been mapped as Beard vegetation association 3, Medium forest; Jarrah - Marri (GIS Database). According to Shepherd et al. (2001) approximately 82.4% of Beard vegetation association 3 remains within the Northern Jarrah Forest subregion and 12.4% is located within conservation reserves.

According to the Bioregional Conservation Status of Ecological Vegetation Classes, the conservation status for the Northern Jarrah Forest subregion and for Beard vegetation association 3 is of 'least concern' (Department of Natural Resources and Environment, 2002).

Mattiske (1999) vegetation mapping of the project area indicates that the vegetation types described for the application area are well represented throughout the surrounding project area and Northern Jarrah Forest subregion. Analysis of aerial photography shows that the vegetation to be cleared is a minor portion of an area of the Jarrah Forest that remains uncleared, therefore, the vegetation within the application area does not represent a significant remnant of native vegetation.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves
IBRA Subregion – Northern Jarrah Forest	1,898,799	1,117,139	~ 58.8	Least Concern	10.0%
Beard veg assoc. – State					
3	2,661,515	1,863,983	~ 70.0	Least Concern	18.45%
Beard veg assoc. – Subregion					
3	908,040	747,888	~ 82.4	Least Concern	12.4%

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

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd *et al*. (2001)
GIS Database:
- Pre European Vegetation DA 01/01

(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**
According to available databases, there are no watercourses or drainage lines recorded within the application area (GIS Database).

No groundwater dependent ecosystems are known to occur in or near the application area (GIS Databases).

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

Methodology GIS Database:
- Geodata, Lakes – GA 28/06/02
- Hydrography, Linear – DoE 1/2/04
- Potential Groundwater Dependant Ecosystems – DoE 2004
- Rivers

(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 Worsley Refinery Lease Area occurs on the lateritic capped Archaean granite and metamorphic rocks of the Darling Plateau (Williams and Mitchell, 2001). A study of the landforms and soil units of the Darling System has been undertaken by Churchward and McArthur (1980). Three landforms and soil units are represented within the project area and these include;

- Dwellingup – Gently undulating landscape with duricrust on ridges; sand and gravels in shallow depressions;
- Murray – Deeply incised valleys with red and yellow earths on slopes; narrow alluvial terraces, and;
- Yarragil – Valleys of the western part of the plateau; sandy gravels on the slopes; orange earth in swampy floors.

Mattiske (1999) identified two vegetation types within the application area. These were:

- Vegetation type S - Open forest of *Eucalyptus marginata – Banksia grandis – Allocasurina fraseriana* with scattered understorey, including *Adenanthos barbiger, Leucopogen capitellatus* and *Styphelia tenuiflori,* and;
- Vegetation type Q - Open forest of *Eucalyptus marginate – Corymbia calophylla – Eucalyptus patens* on lower slopes with mixed understorey species, including *Trymalium floribundum, Acacia extensa* and *Phyllanthus calycinus*.

The vegetation types occur within the Dwellingup and Murray complexes respectively. The soils within the application are likely to vary from duricrust and sandy gravels within vegetation type S, to sandy loams within vegetation type Q (Mattiske 1999; Churchward and McArthur 1980)).

Analysis of aerial photography and topographic information indicates that the site vegetation occurs on the mid to upper slope of the valley system and is characterised by a topographic gradient of approximately 4% (GIS Database). Given the relatively small size of the application area, soil types and topography of the application area, water logging, water erosion and wind erosion are unlikely to occur or be increased either on or off-site.

The area of proposed clearing totals 6.37 hectares and is located adjacent to a highly disturbed area within the Worsley project area (GIS Database). The proposed clearing is not likely to cause appreciable land degradation within the application area, or surrounding areas.

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

Methodology

Churchward and McArthur (1999)
Mattiske (1999)
GIS Database:
- Evaporation Isopleths - BOM 09/98
- Groundwater Salinity, Statewide - DoW
- Topographic Contours, Statewide - DOLA 12/09/02

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments

Proposal is not likely to be at variance to this Principle

The application area is located wholly within the Harris River State Forest which covers an area of approximately 16,000 hectares (GIS Database).

The application area has previously been cleared and rehabilitated, and as a result the 6.37 hectare application area comprises of revegetation (Worsley 2007). Aerial photography shows that application area is an isolated area within the Worsley Refinery Lease Area which has undergone a high level of disturbance due to present and historic mining activities. The vegetation is unlikely to act as a significant ecological linkage or buffer to the surrounding vegetation which adjoins the application area.

The following advice was received from the Department of Environment and Conservation on 8 October 2007 in relation to CPS 2062/1 which is located approximately two kilometres south-east of the application area:

"The issue of clearing vegetation within the State Forest was addressed under the initial State Agreement Act (DEC 2007)".

The proposed clearing of 6.37 hectares is unlikely to significantly reduce the environmental value of the Harris River State Forest.

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

Methodology

DEC (2007)
GIS Database:
- CALM Managed Lands

(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 waterbodies or watercourses within, or in association with the application area (GIS Database). The application area is characterised by a topographic gradient less of than 4%, therefore, any additional runoff which may be generated as a result of the proposed clearing is unlikely to cause significant water erosion issues which may lead to sedimentation and turbidity of downstream waterbodies.

The proposed clearing is located wholly within the Brunswick Catchment Area Public Drinking Water Source Area (PDWSA), and the Leschenault Estuary - Lower Collie Catchment which occupies an area in excess of 91,000 hectares (GIS Database). The proposed clearing of 6.37 hectares of vegetation is unlikely to significantly increase groundwater recharge or cause deterioration in the quality of groundwater.

Advice received from the DoW on 27 December 2007 to the Assessing Officer advised that the DoW has no objection to the proposed clearing (DoW 2007).

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

Methodology

DoW (2007)
GIS Database:
- Groundwater Sailinity, Statewide - DoW
- Hydrographic Catchments – Catchments – DoW
- Hydrography, Linear – DoE 1/2/04

(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 limited amount of clearing proposed (6.37 hectares) in comparison to the extent of the Leschenault Estuary - Lower Collie Catchment (in excess of 91,000 hectares) is unlikely to result in an incremental increase in peak flood height duration.

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

Methodology

GIS Database:
- Evaporation Isopleths – BOM 09/98
- Hydrographic Catchments – Catchments – DoW
- Rainfall, Mean Annual – BOM 30/09/01

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

Comments

There is one Native Title claim over the area under application; (WC98_058). This claim has been registered with the National Native Title Tribunal on behalf of the 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 is no Aboriginal Site of Significance within the application area (GIS Database). Advice received from the Department of Indigenous Affairs on 9 October 2007, states that the proposed clearing does not impact on any registered Department of Indigenous Affairs site and the company will not need to submit a notice under section 18 of the *Aboriginal Heritage Act 1972*. It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

The proposed access road for Worsley Alumina Pty Ltd is subject to the *Mining Act 1978* approval process. A mining proposal must be approved by DoIR prior to the commencement of the proposed works.

It is the proponent's responsibility to liaise with the DEC and the DoW to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licence or approvals are required for the proposed works.

Methodology

DIA (2007)
GIS Database:
- Native Title Claims – DLI 7/11/05
- Sites of Aboriginal Significance DIA

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Production	Mechanical Removal	6.37	The clearing principles have been addressed and the proposed clearing may be at variance to (a), and is not likely to be at variance to Principles (b), (c), (d), (e), (f), (g), (h), (i) and (j). Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of dieback management and permit reporting.

5. References

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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.
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.
DoIR	Department of Industry and Resources, 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.