



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3045/4
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Galaxy Resources Limited**

1.3. Property details

Property: Mining Lease 74/244
Local Government Area: Shire of Ravensthorpe
Colloquial name: Ravensthorpe Spodumene Project

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard Vegetation Associations have been mapped at a scale of 1:250,000 for the whole of Western Australia. Two Beard Vegetation Associations are located within the application area (Shepherd, 2007):

Beard Vegetation Association 142: Medium woodland; York Gum and Salmon Gum; and

Beard Vegetation Association 352: Medium woodland; York Gum.

A flora and vegetation survey covering an area of approximately 614 hectares (which included the application area), was conducted by Botanica Consulting in October 2008. Botanica Consulting (2008) identified 12 vegetation communities during the flora and vegetation survey, two of which were mapped as occurring within the application area:

1. *Eucalyptus oleosa* subsp. *corvina* Woodland

The flora recorded in this vegetation group was representative of *Eucalyptus* Woodland. The species in the upper-storey included *Eucalyptus oleosa* ssp. *corvina*. The understorey species included *Acacia erinacea*, *Melaleuca elliptica*, *Daviesia nematophylla*, *Platysace trachymenioides*, *Olearia muelleri* and *Acacia sulcata* ssp. *platyphylla*.

2. Farm paddock

The flora species recorded in this vegetation group were representative of a farm paddock, being dominated by introduced flora. Species included **Carthamus lanatus* (Saffron Thistle), *Podolepis capillaris* (Wiry Podolepis), **Carrichtera annua* (Wards Weed) **Hordeum leporinum* (Barley Grass), **Phalaris minor* (Lesser Canary Grass) and **Raphanus raphanistrum* (Wild Radish) (Botanica Consulting, 2008). Broad scale clearing has occurred for agricultural purposes in this vegetation group within the survey area.

* = introduced flora species

Clearing Description

Galaxy Resources propose to clear up to 15 hectares of remnant native vegetation on cleared agricultural land, located approximately 1 kilometre north-west of Ravensthorpe (GIS Database). The application area totals approximately 420 hectares.

The proposed clearing will allow Galaxy Resources to commence mining operations (colloquially termed the Ravensthorpe Spodumene Project). The project will involve establishing an open cut pit and constructing associated infrastructure including a tailings storage facility, waste dump, processing plant, access roads and stockpile areas (Keith Lindbeck and Associates, 2009). Vegetation will be cleared via mechanical means and vegetation and topsoil will be stockpiled separately for use in rehabilitation works (Keith Lindbeck and Associates, 2009).

Vegetation Condition

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

to

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

Comment

The vegetation condition rating is based on a combination of sources including:

1. Results of Botanica Consulting's flora and vegetation survey in October 2008;
2. Results of Keith Lindbeck and Associates' Level 2 Spring fauna survey; and
3. A written account of the findings of a Department of Environment and Conservation (DEC) project officer from the Ravensthorpe regional office who visited the proposed clearing area on 16 June 2009.

Clearing Permit CPS 3045/1 was originally granted on 23 July 2009, subject to a number of terms and conditions. One of the conditions required the Permit Holder to develop an offset proposal for approval of the Director, Environment Division, Department of Mines and Petroleum (DMP), prior to undertaking any native vegetation clearing.

Subsequent to the grant of CPS 3045/1, the Permit Holder has developed and submitted an offset proposal to the Director, Environment Division, DMP. The proposed offset involves progressive rehabilitation of the Tailings Storage Facility during and after completion of the project and rehabilitation of the waste dump upon completion of the project.

Clearing Permit 3045/2 was issued 8 October 2009. DMP initiated the clearing permit amendment to extend the duration of the permit so that it was consistent with the current proposed life of mine for the Ravensthorpe Spodumene Project. In addition, the amendment to the permit expiry date ensured that Galaxy Resources offset proposal was legally bound by the clearing permit condition.

On 24 May 2010, the Permit Holder requested that Clearing Permit CPS 3045/2 be amended to reflect a recent tenement conversion. This conversion occurred on 24 December 2009 and involved the replacement of Mining Leases 74/12 and 74/182 with Mining Lease 74/244. Clearing Permit CPS 3045/3 was issued on 1 July 2010.

On 1 November 2010, the Permit Holder requested that Clearing Permit CPS 3045/3 be amended to increase the permit boundary from 366 hectares to 420 hectares. This extension is to include areas that weren't part of the previous amendments as they were not covered by live tenure. The amount of area to be cleared will remain at 15 hectares.

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 application area is located within the Fitzgerald subregion of the Esperance Plains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Fitzgerald subregion primarily consists of dry sclerophyllous woodland, coastal woodlands and heath (DEWHA, 2009). The area has a rich diversity of flora and fauna species, with the Fitzgerald Biosphere Reserve containing over 250 rare and geographically restricted plant and animal species (DEWHA, 2009). Of the 2000 vascular plant species native to the area, approximately 75% are endemic (DEWHA, 2009).

Botanica Consulting conducted a flora and vegetation survey in October 2008 which covered a 614 hectare area that included the application area. This survey identified a total of 128 flora species from 42 families and 76 genera (Botanica Consulting, 2008). The most common families within the surveyed area were Myrtaceae, Chenopodiaceae, Asteraceae and Myrtaceae (Botanica Consulting, 2008). Botanica Consulting (2008) report that the survey revealed diverse flora that are not restricted to the survey area but occur across the Fitzgerald subregion.

Botanica Consulting (2008) reported 22 weed species as occurring within the survey area, including three weed species that are listed on the Declared Plant list produced by the Department of Agriculture and Food (DAFWA):

- Bridal Creeper (*Asparagus asparagoides*) – Priority 1 Control Code
- Saffron Thistle (*Carthamus lanatus*); Priority 1 and Priority 4 (within the Shire of Ravensthorpe) Control Code; and
- Cape Tulip (*Moraea flaccida*) – Priority 1 Control Code.

For species with a Control Code of Priority 1, the movement of plants or their seeds is prohibited within the state. This prohibits the movement of contaminated machinery and produce including livestock and fodder (DAFWA, 2009a).

For species with a Control Code of Priority 4, the infested area must be managed in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery. Treatment must be undertaken to destroy and prevent seed set of all plants:

- within 100 metres inside of the boundaries of the infested property;
- within 50 metres of roads and high-water mark on waterways; and
- within 50 metres of sheds, stock yards and houses.

Treatment must be done prior to seed set each year. Properties with less than 20 hectares of infestation must treat the entire infestation. Additional areas may be ordered to be treated (DAFWA, 2009a).

The proponent's attention is drawn to the provisions of the *Agriculture and Related Resources Protection Act 1976* which require control of Declared Plants. Potential spread of introduced flora species as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The application area is located within a Dieback (*Phytophthora* sp.) Risk Zone (Keith Lindbeck and Associates, 2009). EPA (2000) lists *Phytophthora cinnamomi* dieback disease as a major threat to plant diversity in the south west of Western Australia. However, Keith Lindbeck and Associates (2009) notes that no Dieback is known to be present within the application area and the risk of dieback introduction is negligible given that 89% of disturbance for the Ravensthorpe Spodumene Project is proposed on cleared agricultural land. Potential spread of dieback as a result of the proposed clearing may be minimised by the implementation of dieback management condition.

A Department of Environment and Conservation project officer from the Ravensthorpe office visited the proposed clearing area on 16 June 2009 to assess its environmental significance. The DEC officer noted that there were two principle blocks of remnant vegetation and some other scattered fence line and paddock trees within the proposed clearing area. An account was provided of each remnant area:

The patch of remnant native vegetation within the centre of the proposed clearing area contains a mature overstorey of *Eucalyptus myriadena* and *Eucalyptus extensa*. There is no understorey present, and it is assumed that this has been grazed out. The weed species Boxthorn (*Lycium ferocissimum*) was noted to be present, and the area has been used to dump rocks which have been collected from adjacent paddocks. Whilst the area serves as a shelter belt, there would appear to be no obvious biodiversity value of this area (DEC, 2009).

Within Mining Lease 74/244 there is a patch of remnant native vegetation (approximately 11 hectares in size) which includes an overstorey of *Eucalyptus myriadena* and *Eucalyptus extensa*. A limited understorey exists and consists of *Melaleuca elliptica*, *Acacia glaucoptera* and *Acacia erinacea*. One medium sized Salmon Gum (*Eucalyptus salmonophloia*) is present, along with a number of juveniles (none of which provide fauna nesting hollows). A gully system containing a minor watercourse occurs in this area, feeding into Cordingup Creek. A number of weeds were noted in this particular remnant, including Boxthorn, Hore Hound, Bridal Creeper, Scotch Thistle, Saffron Thistle and Canola (DEC, 2009). The clearing permit application area only covers approximately 2.1 hectares of the north-western corner of this remnant (GIS Database).

From a faunal perspective, Keith Lindbeck and Associates (2008) undertook a Level 2 Spring fauna survey which revealed that whilst remnants of vegetation in the proposed clearing serve some function as fauna habitat, they are not biologically diverse in comparison to other sites sampled in the local area. This is largely due to their small size and degraded nature.

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

Methodology Botanica Consulting (2008)
DAFWA (2009a)
DEC (2009)
DEWHA (2009)
EPA (2000)
Keith Lindbeck and Associates (2008)
Keith Lindbeck and Associates (2009)
GIS Database:
- Clearing Instruments
- IBRA WA (Regions – Subregions)

(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

Keith Lindbeck and Associates (2008) undertook a Level 1 fauna assessment of Galaxy Resources Spodumene Project area in April 2008. The Level 1 survey was used to provide contextual information for a follow up baseline Level 2 Spring fauna survey which was conducted over an eight day period from 16 to 23 October 2008 (Keith Lindbeck and Associates, 2008).

The Level 1 fauna assessment involved searching the DEC's Threatened and Priority Fauna Database, the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* Protected Matters Search Tool and the Western Australian Museum Specimen Database to generate a potential vertebrate fauna species inventory for the Ravensthorpe Spodumene Project area (Keith Lindbeck and Associates, 2008).

The Level 2 baseline survey of the project area was conducted in accordance with the Environmental Protection Authority (EPA) Position Statement 3: '*Terrestrial Biological Surveys as an Element of Biodiversity Protection*' and Guidance Statement No. 56: '*Terrestrial Fauna Surveys for Environmental Impact Assessment*

in Western Australia' (EPA 2002; 2004). The survey involved systematic sampling using pitfall traps, cage traps, Elliot traps and funnel traps. Other sampling methods employed included opportunistic observations, spotlighting, avifauna surveys, detection of bat echolocation calls using electronic equipment and visual invertebrate fauna searches under rocks, bark, leaf litter and hollow logs. Eight sites were chosen as a representative sample of each of the vegetation communities and fauna habitat types within the project area, two of which (5a – central patch of remnant vegetation, and 5b - eastern patch of remnant vegetation) were located within the proposed clearing area (Keith Lindbeck and Associates, 2008).

Keith Lindbeck and Associates (2008) described sites 5a and 5b as degraded remnants of *Eucalyptus oleosa* subsp. *corvina* Woodland. Both sites are adjacent to cleared land, showed signs of heavy grazing, trampling and previous mineral exploration. Fewer vertebrate fauna species and individuals were recorded at sites 5a and 5b than the remaining survey sites. This was not unexpected given that the remaining sites were located in woodland vegetation communities to the east of Floater Road which were rated as 'good' condition (Keith Lindbeck and Associates, 2008).

Keith Lindbeck and Associates (2008) concluded that the Ravensthorpe Spodumene Project area displayed very low species diversity of small mammals in general. Only one species, the Western Pygmy-possum (*Cercartetus concinnus*) was recorded from over 3,000 trap nights. This species was recorded 60 times (three times from site 5b). An opportunistic sighting was made of a Western Grey Kangaroo (*Macropus fuliginosus*) and evidence was observed of Sheep (*Ovis aries*) and Rabbits (*Oryctolagus cuniculus*) (Keith Lindbeck and Associates, 2008).

Anabat detection recorded five species of bats within the Ravensthorpe Spodumene Project area. Bats were recorded at all eight survey sites (including the two degraded survey sites 5a and 5b within the proposed clearing area). None of the bat species were of conservation significance, although one bat was identified to genus level only, therefore its true identity remains unknown. The unidentified bat species was not recorded at either sites 5a or 5b (Keith Lindbeck and Associates, 2008).

With respect to avifauna, 685 individual birds were recorded from 34 species and 20 families during the Level 2 Spring fauna survey. Sites 5a and 5b supported 38 individuals from 12 species and 40 individuals from 11 species respectively. Bird diversity at these sites was marginally higher than at site 2, supporting 224 individuals from 10 species. A total of 22 bird species were recorded at the most diverse site (site 6) (Keith Lindbeck and Associates, 2008).

Two bird species of conservation significance were recorded in the Spodumene Project area:

1. Rainbow Bee-eater (*Merops ornatus*), listed as Marine and Migratory under the *EPBC Act 1999* and Japan-Australia Migratory Bird Agreement; and
2. White-browed Babbler (*Pomatostomus superciliosus ashbyi*) – Priority 4 on the DEC's Threatened and Priority Fauna list.

Neither species was recorded at sites 5a or 5b (Keith Lindbeck and Associates, 2008), and it is not expected that the degraded vegetation within the proposed clearing area would constitute significant habitat for either of these species.

An unconfirmed sighting of the Malleefowl (*Leipoa ocellata*) – Schedule 1 (Fauna that is rare or likely to become extinct), *Wildlife Conservation (Specially Protected Fauna) Notice 2008* and 'Vulnerable', *EPBC Act 1999* was made to the north of the project area in 2008. However, no Malleefowl or evidence of their presence was noted by Keith Lindbeck and Associates (2008).

The Ravensthorpe Spodumene Project area was found to support a healthy and diverse range of reptile species, with 174 individuals recorded from 12 species. Sites 5a and 5b were the exception, supporting six individuals from four species and six individuals from one species respectively (Keith Lindbeck and Associates, 2008).

Two amphibian species were recorded, neither of which was found at sites 5a or 5b. Neither amphibian species was of conservation significance (Keith Lindbeck and Associates, 2008).

Keith Lindbeck and Associates (2008) concluded that the Ravensthorpe Spodumene Project area contains limited preferred terrain or habitat for Short Range Endemic (SRE) fauna. Notwithstanding, a number of scorpions, pseudoscorpions, spiders and pulmonates were collected and submitted to specialists for identification. Given the lack of invertebrate fauna assessments undertaken in the Southern Coastal area, it is not possible to comment on the conservation status or distribution of many of the invertebrates collected from the Project area (Keith Lindbeck and Associates, 2008).

Based on the results of Keith Lindbeck and Associates (2008) Level 2 fauna survey, remnant native vegetation in the proposed clearing area does serve some function in the provision of habitat for birds, mammals and reptile species. However, given the level of degradation and small size of the remnant areas and presence of larger intact native vegetation in surrounding areas, it is unlikely that the proposed clearing area provides significant habitat for any indigenous vertebrate or invertebrate fauna species.

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

Methodology EPA (2002)
EPA (2004)
Keith Lindbeck and Associates (2008)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments Proposal is not likely to be at variance to this Principle

Botanica Consulting conducted a flora and vegetation survey for an area that included the application area in October 2008. This survey identified the following three Priority flora species within the survey area (Botanica Consulting, 2008):

- *Lepidosperma diurnum* (Priority 1);
- *Acacia bifaria* (Priority 3); and
- *Eucalyptus proxima* (Priority 4).

Coordinates of these species locations provided by Botanica Consulting (2008), indicate that none of the recorded taxa occur within the application area.

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

Methodology Botanica Consulting (2008)
DEC (2009a)

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

Comments Proposal is not likely to be at variance to this Principle

There are no known Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the application area (GIS Database). The closest TEC is located approximately 10 kilometres east of the application area (GIS Database). At such a distance from the application area, this ecosystem is unlikely to be affected by the proposed clearing.

Botanica Consulting (2008) report that no TECs or PECs were identified during the flora and vegetation survey of the application area.

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

Methodology Botanica Consulting (2008)
GIS Database:
- Threatened Ecological Sites Buffered

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is at variance to this Principle

The application area falls within the Esperance Plains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) report that approximately 51.1% of the pre-European vegetation still exists in this bioregion, of which approximately 54% is located within conservation reserves (see table overleaf). In addition, there is approximately 53.8% of vegetation remaining within the Fitzgerald IBRA subregion, of which 50.5% remains in conservation estate. There is approximately 59.3% of vegetation remaining within the Shire of Ravensthorpe (Shepherd, 2007).

The vegetation within the application area is recorded as the following Beard Vegetation Associations (Shepherd, 2007):

- **Beard Vegetation Association 142:** Medium woodland; York Gum and Salmon Gum; and
- **Beard Vegetation Association 352:** Medium woodland; York Gum.

According to Shepherd (2007) approximately 12.5% and 28.6% of these vegetation associations remain within the bioregion and subregion respectively (see table overleaf). These vegetation associations are therefore listed as being vulnerable, particularly as they are not represented in conservation estate at the bioregional or subregional level. The Assessing Officer, DMP, also acknowledges that the data used in this assessment (Shepherd, 2007) is outdated, and that it is likely that both Beard Vegetation Associations 142 and 352 have a smaller proportion of their original extent remaining than reported in the table overleaf.

In the context of this clearing proposal, Beard Vegetation Associations 142 and 352 are critical assets as both have less than 30% representation of their pre-clearing extent in the bioregion. The EPA (2000) notes 30% to be the current recognised threshold level below which species loss accelerates exponentially at an ecosystem level.

DEC (2009) advise that an environmental offset is required where native vegetation clearing proposals will impact upon a critical asset. The Environmental Protection Authority's Position Statement No. 9 'Environmental Offsets' defines environmental offsets to be 'environmentally beneficial activities undertaken to counterbalance an adverse environmental impact, aspiring to achieve no net environmental loss or a net environmental benefit outcome'. Critical assets are defined as 'the most important environmental assets in Western Australia that must be fully protected and conserved for the state to meet its statutory requirements and to remain sustainable in the longer term' (EPA, 2006).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA Bioregion – Esperance Plains	2,899,944	1,483,240	~51.1	Least Concern	28.4 (54.0)
IBRA Subregion – Fitzgerald	1,570,670	844,885	~53.8	Least Concern	27.7 (50.5)
Local Government – Ravensthorpe	1,355,762	512,776	~59.3	Least Concern	n/a
Beard veg assoc. – State					
142	711,281	188,533	~26.5	Vulnerable	1.2 (4.0)
352	724,296	119,958	~16.56	Vulnerable	0.42 (2.3)
Beard veg assoc. – Bioregion					
142	2,682	334	~12.5	Vulnerable	0.0
352	22,817	6,525	~28.6	Vulnerable	0.0
Beard veg assoc. – subregion					
142	2,682	334	~12.5	Vulnerable	0.0
352	22,817	6,525	~28.6	Vulnerable	0.0

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)

Presumed extinct Probably no longer present in the bioregion
 Endangered* <10% of pre-European extent remains
 Vulnerable* 10-30% of pre-European extent exists
 Depleted* >30% and up to 50% of pre-European extent exists
 Least concern >50% pre-European extent exists and subject to little or no degradation over a majority of this area

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

Based on the above, the proposed clearing is at variance to this Principle. In accordance with DEC advice and EPA Position Statement No. 9, potential impacts to pre-European vegetation extents may be minimised by a condition being imposed requiring the proponent to develop and implement an environmental offset within the Fitzgerald IBRA subregion. The environmental offset proposal must be endorsed by the decision maker prior to any native vegetation clearing being undertaken, and must focus on offsetting the loss of critical assets (Beard Vegetation Associations 142 and 352).

Methodology DEC (2009)
 Department of Natural Resources and Environment (2002)
 EPA (2000)
 EPA (2006)
 Shepherd (2007)
 GIS Database:
 - IBRA WA (Regions – Subregions)

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

Comments Proposal is at variance to this Principle

The application area contains two minor, ephemeral drainage lines which converge to become one (GIS Database). Botanica Consulting (2008) has reported one vegetation unit that grows in conjunction with these drainage lines:

- *Eucalyptus oleosa ssp. corvina* Woodland.

This vegetation type is reported by Keith Lindbeck and Associates (2009) as being in degraded condition. A substantial length of the drainage lines in the application area cross through farm paddock that has suffered from clearing for agriculture and is in a completely degraded condition (Keith Lindbeck and Associates, 2009). Vegetation maps provided by Botanica Consulting (2008) indicate that the *Eucalyptus oleosa ssp. corvina* Woodland vegetation unit is not restricted to drainage lines and is in fact well represented in areas adjacent to the application area.

Given the presence of drainage features within the application area, the proposed clearing is at variance to this Principle. However, the vegetation unit associated with the drainage lines is well represented locally and on the basis of information provided by Botanica Consulting (2008), would not appear to be riparian in nature. In addition, the vegetation surrounding the drainage lines is classed as varying from a degraded to completely degraded condition.

It is recommended that the proponent liaise with the Department of Water (DoW) to determine whether a Bed and Banks permit is necessary for the proposed works.

Methodology Botanica Consulting (2008)
Keith Lindbeck and Associates (2009)
GIS Database:
- Hydrography, linear

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

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing area is located in the Ravensthorpe 2 subsystem, a soil landscape unit mapped at a 1:100,000 scale by the Department of Agriculture and Food Western Australia (DAFWA). The Ravensthorpe 2 subsystem has a low risk of waterlogging and salinity, and a low to high risk of wind erosion. (DAFWA, 2009b).

The Ravensthorpe Spodumene Project area consists of undulating hill slopes and crests. Hill crests are nearly flat, with slope gradients of 2%. Side slopes vary from 2 – 25% and lower slopes can vary between 10 and 15% (Keith Lindbeck and Associates, 2009).

The Assessing Officer, DMP, notes that a majority of the Ravensthorpe Spodumene Project area consists of cleared agricultural land which has been subject to various forms of degradation, including grazing and trampling by hooved domestic animals. Patches of remnant native vegetation exist in the application area which are classified as degraded, and have little or no understorey, presumably as a result of grazing (DEC, 2009).

DMP sought land degradation advice from DAFWA on this clearing proposal. DAFWA (2009b) made the following comments:

- The proposed clearing is unlikely to cause increased ground water recharge that will result in either on-site or off-site salinity, provided that surface water runoff is managed;
- Minor remnants of native vegetation (less than 0.1 hectares) in the proposed clearing area are not considered significant from a soil conservation perspective; and
- The proposed land clearing is unlikely to be at variance with Principle (g), provided that surface water management measures are implemented.

Surface water management measures will be associated with the waste dump construction as opposed to the clearing of native vegetation. Surface water management will involve diverting natural surface water flows around the toe of the proposed waste dump and into Cattlin Creek. DAFWA (2009b) recommend that stone armouring the diversion channel may be required to overcome erosion risk. The management of surface water associated with waste dump construction will be appropriately managed under the mining proposal assessment process, in accordance with the *Mining Act 1978*.

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

Methodology DAFWA (2009b)
DEC (2009)

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

Comments Proposal is not likely to be at variance to this Principle

The nearest conservation area is the Overshot Hill Nature Reserve, located approximately 2 kilometres north of the application area (GIS Database). Analysis of aerial imagery suggests that the patch of remnant vegetation in the centre of the application area is connected to the Overshot Hill Nature Reserve by a linear strip of paddock trees (also in the application area) and roadside vegetation along Old Newdegate Road. A separate strip of paddock trees in the application area also appears to link the central remnant patch of native vegetation to other larger patches of remnant native vegetation located west of the application area.

Whilst it is difficult for the Assessing Officer, DMP, to comment on the significance of linkages and remnant patches of native vegetation without visiting the site first hand, information provided by a DEC project officer who visited the application area on 16 June 2009 would suggest that the linkages and remnants are unlikely to be significant given the lack of understorey vegetation and presence of invasive weed species.

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

Methodology GIS Database:
- DEC Tenure

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

Comments Proposal is not likely to be at variance to this Principle

Two minor, ephemeral drainage lines are present in the application area, flowing eastwards where they join and flow into Cattlin Creek (GIS Database). Based on the climate of the region, the drainage lines are expected to be dry for the majority of the year. Upon examination of aerial photography, the existing drainage lines are visible as unvegetated incised channels on cleared agricultural before flowing through a remnant patch of native vegetation in a gully on the eastern boundary of the application area. Keith Lindbeck and Associates (2009) notes that vegetation clearing is unlikely to increase surface water runoff or affect the quality of surface water passing through the project area, which is already saline. No other surface water features are present within the application area.

The proposed clearing is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The water table elevation within the region is related to the topography in a subdued fashion: in the western part of the lease it is about 25 metres below ground level, and is less than one metre below ground level near the drainage lines (Keith Lindbeck and Associates, 2009). Reduced groundwater levels indicate that the groundwater flows in a south-easterly direction (Keith Lindbeck and Associates, 2009). The groundwater is recharged by the direct infiltration of rainfall and discharges by evapotranspiration and to Cattlin Creek, which is located immediately east of the application area. The groundwater within the region is classed as saline (Keith Lindbeck and Associates, 2009). The proposed clearing of 15 hectares of degraded, non-contiguous patches of vegetation is unlikely to increase recharge to groundwater or affect water quality (Keith Lindbeck and Associates, 2009). Advice received from DAFWA (2009b) supports this claim.

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

Methodology DAFWA (2009b)
Keith Lindbeck and Associates (2009)
GIS Database:
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

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

Comments Proposal is not likely to be at variance to this Principle

The application area is located in a region of Mediterranean climate that has primarily winter rainfall (Keith Lindbeck and Associates, 2009). There are two minor drainage features in the application area that is expected to be dry throughout the summer months (GIS Database).

Keith Lindbeck and Associates (2009) report that the application area is located within the Ravensthorpe 2 subsystem of the Ravensthorpe soil landscape zone. This subsystem is reported by Keith Lindbeck and Associates (2009) as having a low risk of waterlogging.

The vegetation of the application area is reported as being in degraded to completely degraded condition (Keith Lindbeck and Associates, 2009). Therefore, the proposed clearing is unlikely to significantly increase surface water run-off or increase the incidence or intensity of flooding given the size of the area to be cleared (15 hectares) in comparison to the Culham Inlet Phillips West Steere catchment area (365,830 hectares) and the Jerdacuttup catchment area (173,930 hectares) (GIS Database).

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

Methodology Keith Lindbeck and Associates (2009)
GIS Database:
- Hydrography, linear
- Hydrographic catchments - catchments

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

Comments

Clearing Permit CPS 3045/1 was originally granted on 23 July 2009, subject to a number of terms and conditions. One of the conditions required the Permit Holder to develop an offset proposal for approval of the Director, Environment Division, Department of Mines and Petroleum (DMP), prior to undertaking any native vegetation clearing.

Subsequent to the grant of CPS 3045/1, the Permit Holder has developed and submitted an offset proposal to the Director, Environment Division, DMP. The proposed offset involves progressive rehabilitation of the Tailings Storage Facility during and after completion of the project and rehabilitation of the waste dump upon completion of the project.

Clearing Permit 3045/2 was issued 8 October 2009. DMP initiated the clearing permit amendment to extend the duration of the permit so that it was consistent with the current proposed life of mine for the Ravensthorpe Spodumene Project. In addition, the amendment to the permit expiry date ensured that Galaxy Resources offset proposal was legally bound by the clearing permit condition.

On 24 May 2010, the Permit Holder requested that Clearing Permit CPS 3045/2 be amended to reflect a recent tenement conversion. This conversion occurred on 24 December 2009 and involved the replacement of Mining Leases 74/12 and 74/182 with Mining Lease 74/244. Clearing Permit CPS 3045/3 was issued on 1 July 2010.

On 1 November 2010, the Permit Holder requested that Clearing Permit CPS 3045/3 be amended to increase the permit boundary from 366 hectares to 420 hectares. This extension is to include areas that weren't part of the previous amendments as they were not covered by live tenure. The amount of area to be cleared will remain at 15 hectares.

There are two Native Title claims (WC96/109 and WC98/070) over the area under application (GIS Database). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the tenements have 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 known Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Significance area damaged through the clearing process.

One submission was received for Clearing Permit application CPS 3045/1, objecting to the proposal on the grounds that the proponent had not undertaken adequate consultation. The submission does not relate to any of the Clearing Principles listed in Schedule 5 of the *Environmental Protection Act 1986*.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks permit or any other licences or approvals are required for the proposed works.

In September 2008, DMP referred the Ravensthorpe Spodumene Project to the Environmental Protection Authority (EPA) under section 38 of the *Environmental Protection Act 1986*. On 3 November 2008, the EPA advised that the project would be 'Not assessed – No advice given – Managed under Part V of the EP Act (Clearing)'. The EPA will not formally assess the project but expects the proponent and relevant agencies to ensure that it is environmentally acceptable.

Methodology Keith Lindbeck and Associates (2009)
GIS Database:
- Aboriginal Sites of Significance
- Native Title NNTT

4. Assessor's comments

Comment

The amended proposal has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the *Environmental Protection Act 1986*, and the proposed clearing is at variance to Principles (e) and (f) and is not likely to be at variance to Principles (a), (b), (c), (d), (g), (h), (i) and (j).

5. References

- Botanica Consulting (2008) Ravensthorpe Spodumene Flora and Vegetation Survey. Botanica Consulting, Western Australia.
- DAFWA (2009a) Declared Plants in Western Australia. Available: http://www.agric.wa.gov.au/PC_93088.html. Accessed: 1 July 2009.
- DAFWA (2009b) Land degradation advice. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP), received 17 July 2009. Office of the Commissioner of Soil and Land Conservation, Department of Agriculture and Food Western Australia.
- DEC (2009) Email advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP), received 7 May and 16 June 2009. Department of Environment and Conservation, Western Australia.
- 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.
- DEWHA (2009) Fitzgerald River Ravensthorpe Range Area: South Coast Highway [online]. Available from: <http://www.environment.gov.au/cgi-bin/ahdb/search.pl>. Accessed 26 June, 2008.
- 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, Western Australia.
- EPA (2002) Terrestrial Biological Surveys as an element of biodiversity protection. Position Statement No. 3. March 2002. Environmental Protection Authority.
- EPA (2004) Guidance for the Assessment of Environmental Factors - terrestrial flora and vegetation surveys for Environmental Impact Assessment in Western Australia. Report by the EPA under the Environmental Protection Act 1986. No. 51 WA.
- EPA (2006) Environmental Offsets. Position Statement No. 9. January 2006. Environmental Protection Authority.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Keith Lindbeck and Associates (2008) Ravensthorpe Spodumene Project - Spring 2008 Fauna Survey. Keith Lindbeck and Associates, Western Australia.
- Keith Lindbeck and Associates (2009) Ravensthorpe Spodumene Project - Supporting Documentation for Clearing Permit Application. Keith Lindbeck and Associates, Western Australia.
- Shepherd, D.P. (2007) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.

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.
DMP	Department of Mines and Petroleum, 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
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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.