



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4508/1
 Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Leaf Energy Limited**

1.3. Property details

Property: Mining Lease 47/397
 Local Government Area: Shire of Roebourne
 Colloquial name: Karratha Gravel Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
 Decision Date: 29 September 2011

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 for the whole of Western Australia. One Beard vegetation association has been mapped within the application area (GIS Database; Shepherd, 2009):

589 – Mosaic: Short bunch grassland – savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft Spinifex.

A flora and vegetation survey of the application area was conducted by Native Vegetation Solutions (2011) in March 2011. This survey identified the following six vegetation associations within the application area (Native Vegetation Solutions, 2011):

- *Sorghum* tall grassland;
- *Acacia inaequilatera* over *Acacia bivenosa* over mixed grasses;
- *Acacia inaequilatera* over *Triodia wiseana*;
- *Eragrostis* low grassland;
- Spinifex grassland; and
- Drainage line vegetation.

Clearing Description Leaf Energy Ltd is proposing to clear up to 60.5 hectares of native vegetation for the purpose of expanding an existing borrow pit operation.

Vegetation Condition Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);
 To

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

Comment The application area is located within the Pilbara region of Western Australia and is situated approximately 8 kilometres west of Karratha.

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 occurs within the Roebourne (PIL4) subregion of the Pilbara Interim Biogeographic

Regionalisation for Australia (IBRA) bioregion (GIS Database). This subregion is characterised by quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands (CALM, 2002). Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands (CALM, 2002). Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas (CALM, 2002).

A flora and vegetation survey of the application area was conducted by Native Vegetation Solutions (2011) in March 2011. A total of 66 flora taxa from 23 families were recorded within the application area, therefore suggesting that flora diversity is not high (Native Vegetation Solutions, 2011; Keith Lindbeck and Associates, 2011a).

A total of four introduced flora taxa, *Aerva javanica*, *Citrullus colocynthis*, *Cenchrus ciliaris* and *Lysimachia arvensis* were recorded within the application area during a flora survey conducted by Native Vegetation Solutions (2011). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This can in turn lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. None of these species are listed as 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Agriculture and Food. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The application area lies within the buffer zone of five separate Priority Ecological Communities (PEC's) (GIS Database). The five buffer zones all relate to the same PEC, Roebourne Plains gilgai grasslands (P1) (Native Vegetation Solutions, 2011). This community is described as grasslands with gilgai micro-relief occurring on deep cracking clays and is dominated by *Sorghum* sp. and *Eragrostis xerophila*. A flora and vegetation survey conducted by Native Vegetation Solutions (2011) did not locate any vegetation growing in association with this PEC within the application area.

According to Native Vegetation Solutions (2011) this PEC was not located within the application area.

No Priority flora species were recorded within the application area (Native Vegetation Solutions, 2011).

A Level 1 fauna survey of the application area was conducted by Keith Lindbeck and Associates (2011b). This survey identified that the habitats present within the application area are not considered to be significant and are common locally (Keith Lindbeck and Associates, 2011b). It is therefore considered unlikely that the application area would contain greater faunal diversity than other nearby areas.

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

Methodology CALM (2002)
Keith Lindbeck and Associates (2011a)
Keith Lindbeck and Associates (2011b)
Native Vegetation Solutions (2011)
GIS Database:
- IBRA WA (regions – subregions)
- Threatened Ecological Sites Buffered

(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

A desktop and reconnaissance fauna survey of the application area conducted by Keith Lindbeck and Associates (2011b) identified the potential for three conservation significant fauna species to occur within the application area:

- Australian Bustard (*Ardeotis australis*) Priority 4 –there is potential for this species to utilise the habitats within the application area. However, this species has a large home range and, in the event of disturbance, it is likely to move to nearby undisturbed areas;
- Rainbow Bee-eater (*Merops ornatus*) Migratory – this species may utilise soft loamy soils associated with creeklines for breeding. There is one non perennial creekline within the application area, however, more suitable habitat is present outside of the application area; and
- Barn Swallow (*Hirundo rustica*) Migratory – the preferred habitat for this species is around towns and wetlands. Given the close proximity of Karratha (less than 2 kilometres from the nearest residential area) and the presence of a minor non perennial watercourse it is possible that this species may occur within the application area. However, it has never been recorded within the area and given the presence of more suitable watercourses in nearby areas it is unlikely that the proposed clearing will impact the conservation of this species.

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

Methodology Keith Lindbeck and Associates (2011b)

(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 (DRF) species are known to occur in the application area (GIS Database).

A flora and vegetation survey of the application area was conducted by Native Vegetation Solutions (2011) in May 2011. No DRF species were recorded during this survey (Native Vegetation Solutions, 2011).

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

Methodology Native Vegetation Solutions (2011)

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

There are no known records of Threatened Ecological Communities (TEC's) within the application area (GIS Database). The nearest known TEC is approximately 167 kilometres south-southeast of the application area (GIS Database). At this distance, there is little likelihood of any impact to the TEC as a result of the proposed clearing.

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

Methodology 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 not at variance to this Principle

The application area is located within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). Shepherd (2009) reports that approximately 99.89% of the pre-European vegetation remains in the Pilbara bioregion.

The vegetation in the application area has been broadly mapped as Beard vegetation association:

589: Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft Spinifex.

According to Shepherd (2009) approximately 100% of Beard vegetation association 589 remains within the Pilbara bioregion (see table below).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,193	17,785,001	~99.89	Least Concern	~6.32
Beard vegetation associations - State					
589	809,754	809,637	~99.99	Least Concern	~1.60
Beard vegetation associations - Bioregion					
589	730,718	730,683	~100	Least Concern	~1.77

* Shepherd (2009)

** Department of Natural Resources and Environment (2002)

The vegetation within the application area is not considered to be a remnant of native vegetation in an area that has been extensively cleared.

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (regions – subregions)
- Pre-European Vegetation

(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 GIS Databases, there are no permanent wetlands or watercourses within the application area, however there is one minor ephemeral watercourse within the application area (GIS Database).

Based on vegetation mapping conducted by Native Vegetation Solutions (2011) one vegetation group found within the application area is associated with drainage areas:

Drainage line vegetation: *Eucalyptus victrix*, *Corymbia hamersleyana*, *Senna glutinosa* subsp. *glutinosa*, *Acacia bivenosa*, *Acacia coriacea* subsp. *pendans*, *Acacia tumida* var. *pilbarensis*, *Acacia ligulata*, *Sorghum timorense*, *Eragrostis xerophila*, *Chrysopogon fallax* and *Aristida latifolia*.

While this vegetation type is common, the proponent has avoided two other creeklines adjacent to the application area and committed to avoiding both the creek and the associated vegetation within the application area.

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

Methodology Native Vegetation Solutions (2011)
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 may be at variance to this Principle

The application area intersects the Horseflat land system (GIS Database). The Horseflat land system is characterised by gilgai clay plains supporting tussock grasslands and minor grassy snakewood shrublands (Van Vreeswyk et al., 2004). According to Van Vreeswyk et al. (2004), parts of this land system are moderately to highly susceptible to erosion if vegetation is depleted. Potential land degradation as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

The majority of the application area has been identified as having a moderate to low acid sulphate soil risk (GIS Database). Provided the proposed clearing does not expose the subsoil, then environmental acidity is not expected to rise.

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

Methodology Van Vreeswyk et al. (2004)
GIS Database:
- Acid Sulphate Soil Risk Map, Pilbara Coastline
- Rangeland Land System Mapping

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

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

The proposed clearing is not located within a conservation reserve (GIS Database). The nearest onshore conservation reserve is the ex-Mardie pastoral lease, located approximately 39 kilometres southwest of the application area (GIS Database). At this distance it is unlikely that the proposed clearing will impact on the environmental values of any conservation areas.

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

Methodology GIS Database:
- 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

According to available GIS Databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Roebourne Water Reserve, approximately

38 kilometres east of the application area (GIS Database). At this distance it is unlikely that the proposed clearing will impact on the water quality of the Roebourne Water Reserve.

The annual average rainfall for the application area is approximately 289.1 millimetres with annual evaporation being approximately 3,400 millimetres (BoM, 2011; GIS Database). Therefore, during normal rainfall events water in the application area is likely to evaporate quickly. However, substantial rainfall events create surface sheet flow which is likely to have a higher level of sediments. During normal rainfall events, the proposed clearing would be unlikely to lead to an increase in sedimentation of watercourses within the application area.

The groundwater salinity within the application area is between 1,000 – 3,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be brackish. The proposed clearing is not likely to cause salinity levels within the application area to alter.

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

Methodology BoM (2011)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- Public Drinking Water Source Area (PDWSA)

(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 experiences an arid (semi-desert) tropical climate with an average annual rainfall of approximately 289.1 millimetres (BoM, 2011; CALM, 2002). Cyclonic activity is significant with several systems affecting the coast and hinterland annually (CALM, 2002). Due to cyclonic activity, flooding within the Pilbara region is common and it is considered unlikely that the clearing of 60.5 hectares of native vegetation will cause or exacerbate the incidence or intensity of flooding.

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

Methodology BoM (2011)
CALM (2002)

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

Comments

There is one Native Title Claim (WC99/14) over the area under application (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered 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 Aboriginal Sites of Significance are damaged through the clearing process.

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

The clearing permit application was advertised on 1 August 2011 by the Department of Mines and Petroleum inviting submissions from the public. One submission from the Shire of Roebourne was received in relation to the proposed clearing.

Methodology GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims – Registered with the NNTT

4. References

- BoM (2011) BoM Website - Climate Averages by Number, Averages for KARRATHA AERO. www.bom.gov.au/climate/averages/tables.shtml (Accessed 13 September 2011).
- Department of Conservation and Land Management (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions.
- 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.

- 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 (2011a) Karratha Gravel Project - Expansion of Borrow Pit Operation, Supporting Document for Clearing Permit Application. Unpublished Report, July 2011.
- Keith Lindbeck and Associates (2011b) Karratha Gravel Project - Borrow Pit Extension Fauna Survey. Unpublished report prepared for Carr Civil Contracting, June 2011.
- Native Vegetation Solutions (2011) level 1 Flora and Vegetation Survey Potential Proposed Borrow Pit (M47/397) Karratha. Unpublished Report prepared for Keith Lindbeck and Associates Environmental Management Consultants, May 2011.
- Shepherd, D.P. (2009) 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.
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P., and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia, Department of Agriculture, Western Australia.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), 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 (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.