



This report has been prepared to fulfil the requirements of an accredited environmental assessment process between the Commonwealth and State governments, pursuant to a bilateral agreement established under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This report is set out in three parts:

- Part 1: Application and site details;
- Part 2: Assessment against matters of national environmental significance (pursuant to the EPBC Act); and
- Part 3: Assessment against the clearing principles (pursuant to the *Environmental Protection Act 1986* (EP Act)). Appeal rights pursuant to section 101A of the EP Act are relevant to this section of the report.

## Part 1: Application and site details

### 1. Application details

#### 1.1. Permit application details

Permit application No.:	8171/1
Permit type:	Purpose Permit
EPBC Act reference No.:	EPBC 2017/8133

#### 1.2. Proponent details

Proponent's name:	Lattice Energy Ltd
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#### 1.3. Property details

Property:	Petroleum Exploration Permit EP320
Local Government Area:	Shire of Three Springs and Shire of Irwin
Colloquial name:	Trieste 3D Seismic Survey

#### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
74.539	0	Raised blade mulching, driving over vegetation, walking over vegetation	Seismic Survey

#### 1.5. Decision on application

Decision on Permit Application:	Grant
Decision Date:	9 May 2019
Reasons for Decision:	<p>The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the <i>Environmental Protection Act 1986</i>. It has been concluded that the proposed clearing is at variance to Principles (a), (b), (c) and (e), is not likely to be at variance to Principles (g), (h), (i) and (j), and is not at variance to the remaining clearing principles.</p> <p>It is considered that the proposed clearing will result in the following significant residual impacts:</p> <ul style="list-style-type: none"><li>• Loss of 74.539 hectares of significant foraging habitat for Carnaby's Black Cockatoo (<i>Calyptorhynchus latirostris</i>).</li></ul> <p>To mitigate the significant environmental impacts identified above, and in accordance with the WA Environmental Offsets Policy 2011 and WA Environmental Offsets Guidelines, prior to undertaking any clearing, the Permit Holder is to provide documentary evidence to the CEO that funding has been transferred to the Department to fund the purchase of 218.46 hectares of native vegetation.</p> <p>The Delegated Officer noted that environmental impacts to Carnaby's Black Cockatoo breeding habitat and Threatened Flora species have been avoided and minimised through modifications to the application area.</p> <p>The Delegated Officer determined that the proposed clearing may increase the spread of weeds and dieback into adjacent vegetation. To minimise this impact, a condition has been placed on the permit requiring the implementation of weed and dieback management</p>

measures.

To avoid duplication of approval requirements, the Delegated Officer determined not to include a clearing permit condition requiring the applicant to obtain secondary approval for clearing unsurveyed Threatened Flora species. The Delegated Officer also determined not to include a clearing permit condition requiring the applicant to conduct activities in accordance with the Environmental Plan.

In determining to grant a clearing permit subject to conditions, the Delegated Officer determined that the proposed clearing is unlikely to have any unacceptable environmental impacts.

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

<b>Vegetation Description</b>	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>49: Shrublands; mixed heath;</p> <p>378: Shrublands; scrub-heath with scattered <i>Banksia</i> spp, <i>Eucalyptus todtiana</i> and <i>Xylomelum angustifolium</i> on deep sandy flats in the Geraldton Sandplain Region; and</p> <p>379: Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region (GIS Database).</p> <p>A targeted Threatened and Priority flora survey was conducted over the application area by Mattiske Consulting (2017) seven times between August and November 2017, with the majority of the survey work conducted in September and October 2017. The following vegetation associations were recorded within the application area (Mattiske, 2017):</p> <p>Open heathland (myrtaceous-proteaceous kwongan, grass-tree kwongan and sedge kwongan), sometimes with isolated trees (usually <i>Eucalyptus todtiana</i> (Coastal Blackbutt) and/or <i>Xylomelum angustifolium</i> (Sandplain Woody Pear).</p> <p>Also encountered in the survey area were open woodlands (<i>Eucalyptus accedens</i> (Powderbark Wandoo) and <i>Eucalyptus arachnaea</i> subsp. <i>arachnaea</i> (Black-stemmed Mallee)) and open shrublands (either dominated by <i>Banksia hookeriana</i> (Hooker's Banksia) and <i>Banksia attenuata</i> (Slender Banksia), or <i>Allocasuarina campestris</i>, or <i>Banksia scabrella</i> (P4 – Burma Road Banksia) and <i>Banksia leptophylla</i>, often over open heathland or sedgeland (<i>Mesomelaena</i> spp.).</p>
<b>Clearing Description</b>	<p>Trieste 3D Seismic Survey.</p> <p>Lattice Energy Ltd proposes to clear up to 74.539 hectares of native vegetation within a boundary of approximately 86.89 hectares, for the purpose of a 3D seismic survey. The project is located approximately 42 kilometres west of the town of Three Springs, within the Shire of Three Springs and Shire of Irwin.</p>
<b>Vegetation Condition</b>	<p>Pristine: No obvious signs of disturbance (Keighery, 1994);</p> <p>to:</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>
<b>Comment</b>	<p>The vegetation description and condition was determined from a flora survey by Mattiske Consulting (Mattiske, 2017).</p>

## Part 2: Assessment against matters of national environmental significance

### 3. Assessment of application against Matters of National Environmental Significance

#### Background

##### Comments

Lattice Energy Ltd propose to clear 74.539 hectares of native vegetation within Exploration Permit EP320, for the purpose of a 3D seismic survey. The application area is located 42 kilometres west from Three Springs, in the Shire of Three Springs and Shire of Irwin.

The seismic survey proposes to map geological formations within Exploration Permit EP320, and forms a part of the 100 km<sup>2</sup> second year exploration commitment for the petroleum exploration permit. The data acquired will be used to map geological formations and assess the potential of these formations to hold gas deposits.

The majority of the vegetation within the application area is in a 'pristine' condition (Keighery, 1994). A survey of the application area identified one dominant vegetation association:

Open heathland (myrtaceous-proteaceous kwongan, grasstree kwongan and sedge kwongan), sometimes with isolated trees (usually *Eucalyptus totiana* (Coastal Blackbutt) and/or *Xylomelum angustifolium* (Sandplain Woody Pear).

Also encountered in the survey area were open woodlands (*Eucalyptus accedens* (Powderbark Wandoo) and *Eucalyptus arachnaea* subsp. *arachnaea* (Black-stemmed Mallee)) and open shrublands (either dominated by *Banksia hookeriana* (Hooker's Banksia) and *Banksia attenuata* (Slender Banksia)), or *Allocasuarina campestris*, or *Banksia scabrella* (P4 – Burma Road Banksia) and *Banksia leptophylla*, often over open heathland or sedgeland (*Mesomelaena* spp.) (Mattiske, 2017).

## Description of controlling provision

### Comments

On 10 April 2018 the application was determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the following controlling provisions: Listed Threatened Species and Communities (sections 18 and 18A). The controlled action was considered likely to have a significant impact on Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) listed as Endangered under the EPBC Act, and may have a significant impact on the Sandplain Duck Orchid (*Paracaleana dixonii*) (Endangered under the EPBC Act), Star Sun-orchid (*Thelymitra stellata*) (Endangered under the EPBC Act) and Yandanooka Mallee (*Eucalyptus crispata*) (Vulnerable under the EPBC Act).

Through the assessment it was identified that all surveyed locations of the Sandplain Duck Orchid (*Paracaleana dixonii*), Star Sun-orchid (*Thelymitra stellata*) and Yandanooka Mallee (*Eucalyptus crispata*) have been avoided and are not within the application area. However the proposed clearing may still have an indirect impact on these species, given that some of the receiver lines are within 10 metres of an individual record (Lattice Energy, 2019) of both the Sandplain Duck Orchid and the Star Sun-Orchid.

The two records for the Yandanooka Mallee species are over 90 metres and 1.5 kilometres away from the proposed clearing (Lattice Energy, 2019).

### Carnaby's Black Cockatoo

Currently, the overall population trend for the Carnaby's Black Cockatoo is one of decline due to the loss and fragmentation of habitat as a result of clearing of native vegetation (Garnett et al., 2011; Johnstone and Storr, 1998; Saunders, 1990; Saunders and Ingram, 1998) Carnaby's Black Cockatoo is endemic to the south-west of Western Australia. Breeding takes place between late July and December and occurs mostly in the inland wheatbelt region of its distribution, in areas receiving between 300 and 750 millimetres of annual average rainfall (Saunders, 1974). During the non-breeding season (January to July) the majority of the birds move to the higher rainfall coastal regions of their range including the midwest coast, Swan Coastal Plain and south coast (Johnstone et al., 2011; Saunders, 1980; 1990). There has been an apparent expansion in the breeding range to include areas further west and south since the middle of last century with a more rapid increase into the Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) forests of the south west (Johnstone and Storr, 1998; Johnstone et al., 2011). This expansion in breeding range is due to threatening processes such as clearing of breeding habitat and competition for suitable breeding hollows.

Carnaby's Black Cockatoo preferred habitat is remnant native eucalypt woodlands, especially those of salmon gum (*Eucalyptus salmonophloia*) and wandoo (*Eucalyptus wandoo*), and in shrubland or kwongan heathland dominated by plants of the Proteaceae family. It also occurs in forests containing marri, jarrah, karri (*Eucalyptus diversicolor*) and tuart (*Eucalyptus gomphocephala*) (DPaW, 2013). Carnaby's Black Cockatoo nests in large hollows in tall, living or dead eucalypts. It nests most commonly in smooth-barked wandoo and salmon gum, but has also been recorded breeding in red morrell (*Eucalyptus longicornis*), York gum (*Eucalyptus loxophleba*), tuart (*Eucalyptus gomphocephala*), flooded gum (*Eucalyptus rudis*), swamp yate (*Eucalyptus occidentalis*), gimlet (*Eucalyptus salubris*) and marri, and is said to nest in any species of eucalypt with a suitable hollow (DPaW, 2013).

The Carnaby's Cockatoo Recovery Plan (DPaW, 2013) summarises habitat critical to the survival of Carnaby's Black Cockatoos as:

- the eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding;
- woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and
- in the non-breeding season the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resources.

The recovery plan also states that success in breeding is dependent on the quality and proximity of feeding habitat within 12 kilometres of nesting sites (DPaW, 2013). Along with the trees that provide nest hollows, the protection, management and increase of this feeding habitat that supports the breeding of Carnaby's Black Cockatoo is a critical requirement for the conservation of the species (DPaW, 2013).

### **Sandplain Duck Orchid**

*Paracaleana dixonii* is a terrestrial orchid with a linear leaf, and one or two greenish-brown flowers (DEWHA, 2008a). Flowering occurs from October to January, and by the time of flowering, the leaf is often dry and withered due to the hot summer temperatures (DEWHA, 2008a).

*Paracaleana dixonii* is endemic to Western Australia, and is known from eight populations from Arrowsmith, Eneabba and south to the Jurien Bay area. In 2009, the species was also recorded in the Moore River National Park, which is a disjunct location (DEWHA, 2008a). This species occurs in small isolated colonies in deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (Hopper and Brown, 2006; Western Australian Herbarium, 1998-).

The main threats to this species are fire, land clearing for mining activities such as exploration drilling, road works, and railway and power line maintenance activities. Although fire plays an important part in the flowering of the species, burning may be detrimental if it occurs during the growing period (May to December) (Brown et al., 1998; Patrick and Brown, 2001).

### **Star Sun-orchid**

*Thelymitra stellata* is a terrestrial orchid with multiple golden-brown flowers with yellow or orange sepals and petals on a single, robust stem (DEWHA, 2008b). Flowering occurs from late September to November, and the leaf is usually shrivelled by the time of flowering, and the plant dies back below ground level after seed set (DotEE, 2018).

*Thelymitra stellata* is endemic to Western Australia, and is known from 42 populations from the Geraldton Sandplains (between Arrowsmith River, Coomallo Nature Reserve and Lesueur National Park) and Jarrah Forest (Toodyay, Muchea and Armadale) (DotEE, 2018). The populations are small, most numbering fewer than 10 plants. This species occurs in low heath and scrub in Jarrah and Wandoo woodland, both on ridges and slopes, flats, and also on riverbanks and breakaways (DotEE, 2018; DEWHA, 2008b).

The main threats to this species are fire during the growing season, feral rabbits, broad scale vegetation clearing, and increasing fragmentation of habitat (ANRA, 2007; CALM, 2002).

### **Yandanooka Mallee**

*Eucalyptus crispata* is an erect or spreading mallee, with smooth grey bark on its upper trunk, and peeling flakes at the base. Flowering occurs from March to June, with inflorescences of up to 13 yellow-cream flowers on stalks (Western Australian Herbarium, 1998-).

*Eucalyptus crispata* is endemic to Western Australia, where it is known from 10 populations in the Yandanooka to Eneabba area, and extends down past Boothendarra in the Moora district. A total of 85 *Eucalyptus crispata* individuals are known in the wild, with population sizes ranging up to 20. This species occurs as small stands in low woodland and mallee in clayey soils in shallow gullies, or on lateritic or granite breakaways and slopes (DEWHA, 2008c; Western Australian Herbarium, 1998-).

The main threats to this species are fire, dieback, grazing, and land clearing (DEWHA, 2008c).

### **Methodology**

ANRA (2007)  
Brown et al. (1998)  
CALM (2002)  
DEWHA (2008a)  
DEWHA (2008b)  
DEWHA (2008c)  
DotEE (2018)  
DPaW (2013)  
Garnett et al. (2011)  
Hopper and Brown (2006)  
Johnstone et al. (2011)  
Johnstone and Storr (1998)  
Patrick and Brown (2001)  
Saunders (1974)  
Saunders (1980)  
Saunders (1990)  
Saunders and Ingram (1998)  
Western Australian Herbarium (1998-)

## Summary of Impacts

### Comments

#### **Carnaby's Black Cockatoo**

According to the Commonwealth Department of the Environment's EPBC Act referral guidelines for Western Australia's three threatened black cockatoo species, the proposed clearing falls within the known distribution range for Carnaby's Black Cockatoo (SEWPAC, 2012).

Black cockatoos generally forage within six kilometres of a night roost site and, while nesting, within a 12 kilometre radius of their nest site (SEWPAC, 2012).

In November 2017, Western Wildlife undertook a field assessment of the application area for fauna values which included the identification of broad fauna habitats, opportunistic records of fauna, and a targeted search for evidence of any conservation significant species, particularly foraging, breeding or roosting habitat for Carnaby's Black Cockatoo.

The field assessment identified foraging habitat for Carnaby's Black Cockatoos within the application area, however no roosting or breeding habitat was evident (Western Wildlife, 2017). The whole application area contains foraging habitat for Carnaby's Black Cockatoo, comprising of:

- Banksia shrubland (particularly *Banksia attenuata* and *Banksia hookeriana*, but also *Banksia sphaerocarpa* and/or *Banksia scabrella*) on sands or gravelly sands, and small areas of *Hakea trifurcata* and *Banksia sessilis* on some of the laterite rises (Western Wildlife, 2017).

The field assessment found no direct evidence of Carnaby's Black Cockatoo utilising the application area (Western Wildlife, 2017). However, noting the cockatoo's distribution and habitat preferences, the application area has the potential to contain critical habitat for this species given that it contains several plant species that provide quality foraging resources for the species (Groom, 2011), is adjacent to a water source (Arrowsmith River, approximately 50 metres at the closest point, east and south-east of the application area) and is adjacent to potential breeding habitat (Wandoo woodland, approximately 20 metres at the closest point, north-east of the application area (GIS Database).

The Carnaby's Cockatoo Recovery Plan notes that there are multiple reasons for the decline of Carnaby's Black Cockatoo, however the decline to-date has primarily been brought about by the extensive clearing of nesting and feeding habitat (DPaW, 2013). Loss of nesting habitat, together with foraging areas and watering sites within foraging distance of breeding sites is one of the key threatening processes contributing towards the decline of the species. A further significant threat is the clearing, fragmentation and degradation of foraging and night roosting habitat in the non-breeding parts of Carnaby's Black Cockatoo range in the southwest of Western Australia and particularly on the Swan Coastal Plain (DPaW, 2013). The long-term survival of Carnaby's Black Cockatoo depends on the availability of suitable breeding habitat and foraging habitat capable of providing enough food to sustain the population (DPaW, 2013).

Given the entire application area contains suitable foraging habitat, it is considered that the vegetation proposed to be cleared is important for the long term protection of black cockatoos.

#### **Sandplain Duck Orchid**

The approved conservation advice for *Paracaleana dixonii* Hopper & A.P.Br. (Sandplain Duck Orchid) lists fire, and land clearing for mining activities as the main threat to the orchid (DEWHA, 2008a). The main potential threat to the orchid is dieback caused by *Phytophthora cinnamomi* (DEWHA, 2008a).

A targeted flora and vegetation survey was conducted by Mattiske (2017) between August and November 2017 within the application area. The survey identified five populations of *P. dixonii* totalling 29 individuals within the survey boundary. The proponent has modified the application area to avoid the known populations of *P. dixonii* (Lattice Energy, 2018a; Mattiske, 2017). No known populations of *P. dixonii* will be removed under this application, however given the nature of orchids and as only one season of survey was undertaken for the threatened orchids, the species may be indirectly impacted by the proposed clearing (DBCA, 2018). The proponent's Environment Plan proposes management actions that will be undertaken to minimise impacts to *P. dixonii*.

- The height of the mulching device will be set at 5 to 10 cm to avoid rosettes (if present) (Lattice Energy, 2018a).

#### **Star Sun-orchid**

The approved conservation advice for *Thelymitra stellata* (Star Sun-orchid) lists fire, feral rabbits, broad scale clearing and fragmentation as the main threats to the orchid (DEWHA, 2008b). The main potential threat to the orchid are weeds, recreational activities, road widening activities and gravel extraction (DEWHA, 2008b).

A targeted flora and vegetation survey was conducted by Mattiske (2017) between August and November 2017 within the application area. The survey identified seven populations of *T. stellata* totalling 38 individuals within the survey boundary. The proponent has modified the application area to avoid the known populations of *T. stellata* (Lattice Energy, 2018a; Mattiske, 2017). No known populations of *T. stellata* will be removed under this

application, however given the nature of orchids and as only one season of survey was undertaken for the threatened orchids, the species may be indirectly impacted by the proposed clearing (DBCA, 2018). The proponent's Environment Plan proposes management actions that will be undertaken to minimise impacts to *P. stellata*:

- Mulching will occur outside the flowering period; and
- The height of the mulching device will be set at 5 to 10 cm to avoid rosettes (if present) (Lattice Energy, 2018a).

#### **Yandanooka Mallee**

The approved conservation advice for *Eucalyptus crispata* (Yandanooka Mallee) lists fire, grazing and land clearing as the main potential threats to the Mallee. The susceptibility of this species to dieback caused by *Phytophthora cinnamomi* is unknown (DEWHA, 2008c).

A targeted flora and vegetation survey was conducted by Mattiske (2017) between August and November 2017 within the application area. The survey identified a single population of *E. crispata* totalling two individuals within the survey boundary. This species was recorded in the northeast corner of the survey boundary along the edge of a dry creekline (Mattiske, 2017). The proponent has modified the application area to remove this vegetation type from the application area, therefore avoiding the known populations of *E. crispata* (Lattice Energy, 2018a).

The proposed clearing could still have an indirect impact on *Paracaleana dixonii*, *Thelymitra stellata* and *Eucalyptus crispata*, given that some of the receiver lines are within 10 metres of an individual record (Lattice Energy, 2019) of both the Sandplain Duck Orchid and the Star Sun-Orchid. Lines will be diverted (where possible) to provide a bigger buffer (Lattice Energy, 2019). A Threatened Flora Authorisation issued under the *Biodiversity Conservation Act 2016* will be obtained by the applicant to mulch within 10 metres of known locations of the Sandplain Duck Orchid and the Star Sun-Orchid where a larger buffer zone can not be achieved (Lattice Energy, 2019). Indirect impacts include the potential introduction of Dieback (*Phytophthora cinnamomi*), and increase in human visitation following mulching. These indirect impacts have been considered and managed within the proponent's Environment Plan (Lattice Energy, 2018a). Dieback has not been identified within the application area (GIS Database), however appropriate clean down procedures for vehicles will be implemented, and clearing activities will occur during dry conditions only. Tracks will be blocked to prevent third-party access, assisting in reducing access for human visitation (Lattice Energy, 2018a).

**Methodology** DBCA (2018)  
DEWHA (2008a)  
DEWHA (2008b)  
DEWHA (2008c)  
DPaW (2013)  
Groom (2011)  
Lattice Energy (2018a)  
Mattiske (2017)  
SEWPAC (2012)

#### **Public consultation**

The application was advertised online on 3 September 2018 for a 21 day submission period between 3 September 2018 and 24 September 2018. No public comment was received during this period.

#### **Avoidance, mitigation and offset**

##### **Avoidance and Mitigation**

The proponent has advised that there are no alternative locations that will meet the proponent's regulatory obligations relating to the EP320 permit.

The proponent has advised that the following changes were made to the design in order to minimise the clearing impact to the smallest footprint possible (Lattice Energy, 2018a):

- The proponent has considered a traditional orthogonal survey grid over the survey area that would have resulted in survey lines spaced 240 metres x 240 metres apart. This has been substituted for the use of a 360 metres x 360 metres grid in order to minimise vegetation clearing;
- The project's line preparation has been reduced from a standard 4.5 metres width to 4 metres width, and in areas of native vegetation, further reductions in mulching are expected to be realised by reducing an estimated 20% to 50% of receiver line widths down from 4 metres to 2.8 metres in select locations (to be determined at the time of the seismic survey);
- The project has eliminated the need to mulch through the wandoo woodland in the northeast part of the UCL, which is important Carnaby's Black Cockatoo habitat;
- The project avoids Priority 1 Flora species *Lasiopetalum ogilvieanum* and *Tricoryne soullierae* known locations;
- Trees and shrubs with a Diameter at Breast Height (DBH) of greater than 20 centimetres will not be mulched in

order to preserve potential breeding habitat for Carnaby's Black Cockatoo (Lattice Energy, 2018a).

The proponent has reduced the application area from 252 hectares to 86.89 hectares, and reduced the amount of clearing from 120 hectares to 74.539 hectares, therefore less Carnaby's Black Cockatoo foraging habitat will be impacted.

The proponent has advised that the design of the project has avoided all known populations of the following protected flora species under Part 3 of the EPBC Act:

- The Endangered Sandplain Duck Orchid (*Paracaleana dixonii*);
- The Endangered Star Sun-orchid (*Thelymitra stellata*); and
- The Vulnerable Yandanooka Mallee (*Eucalyptus crispata*) (Lattice Energy, 2018a; Mattiske, 2017).

The proponent will not completely clear native vegetation. The proponent has elected to pursue mulching rather than vegetation rolling. The mulching method is preferred over rolling for the following reasons:

- Mulching uses conventional agricultural tractors to mulch and distribute the debris evenly across the cut path. It has a smaller surface impact and can be more selective in what vegetation to clear;
- There is no topsoil disturbance, reducing the risk of erosion and impacts on water filtration into the thin topsoil layer containing the seed resource, in turn reducing the potential for weed invasion and establishment;
- The operator can select a path of avoidance around established vegetation (i.e. large trees);
- Rootstock is more likely to stay in place than rolling, as the plant stem is cut rather than pushed over; and
- The mulched debris breaks down quickly to return nutrients to the soil (Lattice Energy, 2018a).

The proponent has advised of the following mitigation measures to minimise both direct and indirect impacts to conservation significant species within the application area (Lattice Energy, 2018a):

- Mulchers will be loaded with pre-determined and validated GPS data to ensure that source and receiver lines are prepared in accordance with ecological advice;
- No off line driving (for short-cuts);
- No mulching vegetation during late winter and spring (August to November) when birds have eggs and unfledged young in the nest;
- Clean down facilities (for vehicles and footwear) will be available at the laydown sites and Iluka Resources sites;
- Blowdown will occur in preference to wash down where practicable, so as to avoid creating conditions suitable for *Phytophthora cinnamomi* (warm, moist conditions). Mobile clean down stations will be provided to facilitate this;
- Inspect and clean each node prior to deployment;
- An accredited certifier (trained with Clean and Inspect Vehicle and Machinery certification, AHCBIO201A, or equivalent) will be present to inspect equipment and vehicles and certify them clean prior to proceeding to the next property; and
- Avoid preparing survey lines and undertaking survey acquisition during periods of heavy rain (and immediately afterwards, while pooled water is present and ground conditions are too soft) to prevent soil rutting/churning (which in turn promote conditions favouring weed and pathogen invasion) (Lattice Energy, 2018a).

## **Offset**

The proponent identified the following significant residual environmental impact associated with the proposed clearing:

- 74.539 hectares of Carnaby's Black Cockatoo foraging habitat.

To counterbalance the above impacts associated with matters of national environmental significance (Carnaby's Black Cockatoo) the proponent proposed an offsets package that consists of a monetary contribution of \$104,860.80 towards the purchase of 218.46 hectares of remnant vegetation to be transferred to conservation estate, to offset impacts to Carnaby's Black Cockatoo. These figures are based on vegetated land values and the Commonwealth's Offsets Assessment Guide.

In assessing whether the proposed offset is adequately proportionate to the significance of the habitat values for Carnaby's Black Cockatoo being impacted, the Department of Mines, Industry Regulation and Safety (DMIRS) undertook a calculation using the Commonwealth Offsets Assessment Guide. DMIRS's calculation indicated that 218.46 hectares is required to counterbalance the loss of 74.539 hectares of black cockatoo habitat. Based on this calculation \$104,860.80 is required to be transferred to the state offset fund.

DMIRS considered the adequacy of the proposed offset in conjunction with the *Environmental Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy October 2012 and the WA Environmental Offsets Policy 2011:

- In respect to the impacts to Carnaby's Black Cockatoo, DMIRS determined that the proposed offset for Carnaby's Black Cockatoo is adequate to offset the loss of 74.539 hectares of foraging habitat. DMIRS' determination is based on the assumption that the proposed offset site is in a pristine (Keighery, 1994) condition and will be transferred to the conservation estate.

The (Commonwealth) Department of the Environment and Energy is still considering the offset strategy provided by the proponent, and the assessment will be focused on its ability to offset the residual significant impacts of the proposal on the Carnaby's Black Cockatoo in accordance with the Department's EPBC Act Environmental Offsets Policy.

**Methodology** Keighery (1994)  
Lattice Energy (2018a)  
Mattiske (2017)

## Other relevant considerations

The following information was included in the proponent's referral documentation provided to the Commonwealth and in an email provided by the proponent dated 24 September 2018 (Lattice Energy, 2018b).

### Economic and Social Matters

#### **Capital investment and ongoing value**

Lattice Energy Ltd are undertaking the project to explore for additional natural gas reserves to assist with providing ongoing domestic gas supplies. To date \$1.6 million dollars has been invested in obtaining approvals for the project. Completion of the project is expected to have resulted in an investment of \$1.8 million dollars.

The local community will benefit during acquisition and planning, and rehabilitation phases of the survey through providing accommodation, meals, and essential services to the workforce. Local contractors and employment of local workers will be undertaken where possible. The project is designed to mature prospects for drilling, which could lead to the drilling of two exploration wells (capital investment of approximately \$30 million dollars). Successful intersection of commercial hydrocarbons will lead to further development and exploration activities in the region, with state royalties being generated.

#### **Basis for an estimation of cost and/or benefits**

Project costs are based on Lattice Energy Ltd's experience and other seismic surveys conducted within the region over the last 10 years, along with contractor tenders and quotations.

#### **Potential employment opportunities**

The Banksia Accommodation Village in Eneabba will be utilised to accommodate the seismic survey work force. Employment of local community members will be undertaken to provide staff for the operation of accommodation facilities. Utilisation of local contractors will be undertaken (i.e. fuel supply, miscellaneous local supplies, mulching contractor, light vehicle mechanical service centres and fencing contractor).

#### **Public and stakeholder consultation activities, including any outcomes**

Other than landholders located within the proposed area, the proponent has been liaising with a number of stakeholders which include government agencies, the local shire, indigenous groups, the petroleum industry and the police for the local shires, prior to the submission of a native vegetation clearing permit application. The proponent's Environmental Plan and supporting documentation was made publically available and the clearing permit application was subject to a 21 day public advertising period by DMIRS.

### Applicant's Environmental History

The proponent has not previously submitted an EPBC Act referral or submitted a clearing permit application under the EP Act.

## Part 3: Assessment against the clearing principles

### 4. Assessment of application against clearing principles

#### (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

##### Comments

##### **Proposed clearing is at variance to this Principle**

The application area occurs within the Lesueur Sandplain subregion of the Geraldton Sandplains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion contains shrub-heaths rich in endemics occurring on a mosaic of lateritic mesas, sandplains, coastal sands and limestones (CALM, 2002). The subregion exhibits extremely high floristic endemism and is also regarded as having particularly high floristic diversity (CALM, 2002).

A targeted flora and vegetation survey was conducted over the application area by Mattiske Consulting (Mattiske, 2017). The survey involved seven visits to the application area over four months totalling 63 field days (August to November 2017) (Mattiske, 2017). Mattiske (2017) mapped the majority of the vegetation within the application area as open myrtaceous-proteaceous heathland, however noted areas of open woodlands and open shrublands. The remnant vegetation within the application area varied in condition from 'Pristine' to 'Excellent' on the Keighery scale (Keighery, 1994), with weeds present in small areas (Mattiske, 2017). The majority of the application area was a 'Pristine' condition (Mattiske, 2017; GIS Database).

The targeted survey identified four Threatened Flora species, two Priority 1 Flora species, two Priority 2 Flora species, 10 Priority 3 Flora species, and five Priority 4 Flora species within the application area (Mattiske, 2017). The proponent has amended the application area to avoid all known Threatened Flora species within the application area (Lattice Energy, 2018a; Mattiske, 2017).

##### **Priority 1 Flora species**

- *Lasiopetalum ogilvieanum*: There were 3 locations surveyed within the application area totalling 56 individuals. These records were under isolated trees in the heathland (Mattiske, 2017). DBCA (2018)



advise that proposed impacts of clearing this species could be significant to the conservation of the species. Given that the proponent has committed to avoiding shrubs where the trunks have a larger diameter at breast height (DBH) than 20cm, mature plants of this species can be avoided.

- *Tricoryne soullierae*: There were 183 locations surveyed within the application area totalling 365 individuals (Mattiske, 2017). DBCA (2018) advise that the locations within the application area make it a considerable range extension for the species. This species dies back to an underground rhizome post-flowering (Mattiske, 2017) and the proposed clearing will occur after this period (Lattice Energy, 2018a). Potential impacts to Priority flora as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition.

### **Priority 2 Flora species**

- *Persoonia filiformis*: There were 119 locations surveyed within the application area totalling 154 individuals. These records were scattered in heathland within the application area. Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 83.9 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Stylidium pseudocaespitosum*: There were 12 locations surveyed within the application area totalling 39 individuals (Mattiske, 2017). These records were scattered in heathland, open woodland or near isolated trees over open heathland in the central-northern portion of the application area. Individuals under large trees can be avoided. Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 37.5 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.

### **Priority 3 Flora species**

- *Grevillea biformis* subsp. *cymbiformis*: A single plant was recorded within the eastern portion of the application area. This species can be easily avoided as it occurs as a single plant (Lattice Energy, 2018a).
- *Guichenotia alba*: There were 26 locations surveyed within the application area totalling 75 individuals (Mattiske, 2017). Based on Mattiske's (2017) high impact assessment of a 10 metre wide mulching corridor, approximately 40.2 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Hemiandra* sp. *Eneabba*: There were 185 locations surveyed within the application area totalling 243 individuals, with the majority located in the south-western and southern portions of the application area (Mattiske, 2017). Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 74.6 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Hypocalymma gardeneri*: There were four plants recorded within the application area. This species can be easily avoided as it occurs as single plants (Lattice Energy, 2018a).
- *Mesomelaena stygia* subsp. *deflexa*: There were 2,145 locations surveyed within the application area totalling 98,696 individuals (Mattiske, 2017). Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 87.2 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Persoonia rudis*: There were 15 locations surveyed within the application area totalling 13 individuals (Mattiske, 2017). These records were in the central and south-western portion of the application area as scattered plants in heathland. This species can be easily avoided as it occurs as single plants (Lattice Energy, 2018a).
- *Stylidium drummondianum*: There were 246 locations surveyed within the application area totalling 2,122 individuals (Mattiske, 2017). Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 12.7 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Stylidium torticarpum*: There were 24 locations surveyed within the application area totalling 406 individuals (Mattiske, 2017). Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 8.5 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.

- *Synaphea oulopha*: There were 5 locations surveyed within the application area totalling 25 individuals (Mattiske, 2017). Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 18.5 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Verticordia luteola* var. *luteola*: A single plant was recorded within the eastern portion of the application area. This species can be easily avoided as it occurs as a single plant (Lattice Energy, 2018a).

#### **Priority 4 Flora species**

- *Banksia scabrella*: There were 695 locations surveyed within the application area totalling 5,800 individuals (Mattiske, 2017). Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 85.1 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Desmocladius elongatus*: There were 101 locations surveyed within the application area totalling 146 individuals (Mattiske, 2017). These records were scattered in heath and shrubland. Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 43.2 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Eucalyptus macrocarpa* subsp. *elachantha*: There were 61 locations surveyed within the application area totalling 24 individuals (Mattiske, 2017). This species can be easily avoided as it grows in distinct clumps (Lattice Energy, 2018a).
- *Pityrodia viscida*: There were 214 locations surveyed within the application area totalling 542 individuals (Mattiske, 2017). These records were scattered in heath and shrubland. Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 16.8 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.
- *Schoenus griffinianus*: There were 23 locations surveyed within the application area totalling 62 individuals (Mattiske, 2017). These records were along old tracks and firebreaks. Based on Mattiske's (2017) impact assessment of a 10 metre wide mulching corridor, approximately 5.9 percent of the known populations will be impacted. However, the proponent has committed to a mulching corridor of 4 metres, and will further reduce widths where possible.

Maximum impacts are predicted to be moderate to high to a large number of Priority flora, but are unlikely to be significant to the conservation of the above species, with the exception of the Priority 1 Flora species (DBCA, 2018). In areas of Priority flora where there is a predicted high impact, reduction of line width should be applied (DBCA, 2018). The proponent has advised that hand deploying equipment along receiver lines and the utilisation of existing access tracks will be used where possible to further reduce potential impacts to conservation significant flora (Lattice Energy, 2018a).

No Priority Ecological Communities or Threatened Ecological Communities were recorded within the application area (GIS Database).

One broad habitat type was recorded within the application by Western Wildlife (2017). The application area has suitable habitat for several conservation significant fauna species, and provides suitable foraging habitat for the Carnaby's Black Cockatoo (DBCA, 2018; Western Wildlife, 2017; GIS Database). The remnant vegetation within the application area has the potential to comprise of high faunal diversity.

Weeds and dieback have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed and dieback management condition.

The presence of Threatened flora and Priority flora within the application area raises the diversity of the area from a floristic perspective. Aerial imagery confirms that the surrounding local area has largely been cleared for agricultural purposes (GIS Database).

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

**Methodology** CALM (2002)  
DBCA (2018)  
Lattice Energy (2018a)  
Mattiske (2017)  
Western Wildlife (2017)

GIS Database:

- IBRA Australia
- Imagery
- Pre-European Vegetation
- Threatened and Priority Ecological Communities boundaries
- Threatened and Priority Ecological Communities buffers

**(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 Proposed clearing is at variance to this Principle**

A Level 1 fauna survey and black cockatoo habitat survey was conducted by Western Wildlife (2017) between 6 and 7 November 2017, one general habitat type was identified within the application area:

- Banksia shrubland (*Banksia attenuata*, *Banksia hookeriana*, *Banksia scabrella* and/or *Banksia sphaerocarpa*), Woody Pear (*Xylomelum angustifolium*) and open low *Eucalyptus tottiana* woodland on the deeper sands.

Western Wildlife (2017) state that the majority of the vegetation condition was 'excellent' (Keighery, 1994). There is some disturbances from access tracks, firebreaks and gravel extraction (Western Wildlife (2017).

There are three fauna species of conservation significance listed as either threatened species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or protected under Western Australian legislation (*Biodiversity Conservation Act 2016* (BC Act)), which may potentially occur within a 10 kilometre radius of the application area (NatureMap, 2019). Based on habitat type, vegetation mapping associated with the application area (Mattiske, 2017; Western Wildlife, 2017) and available databases (NatureMap, 2019; GIS Database), the following conservation significant fauna species may occur within the application area;

- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) – EPBC Act (Endangered), BC Act (Schedule 2);
- Rainbow Bee-eater (*Merops ornatus*) – EPBC Act (Marine);
- Fork-tailed Swift (*Apus pacificus*) – EPBC Act (Migratory), BC Act (Schedule 5);
- Peregrine Falcon (*Falco peregrinus*) – BC Act (Schedule 7);
- A katydid (*Hemisaga vepreculae*) – Priority 2;
- A katydid (*Phasmodes jeeba*) – Priority 3;
- Black-striped Snake (*Neelaps calonotos*) – Priority 3; and
- Woolybush Bee (*Hylaeus globulifera*) – Priority 3.

The Carnaby's Black Cockatoo is listed as endangered under the EPBC Act, with populations declining dramatically due to land clearing for agriculture in regional areas and for urban development (Shah, 2006). The application area contains suitable vegetation to provide foraging habitat for Carnaby's Black Cockatoo (DBCA, 2018; GIS Database). Western Wildlife (2017) undertook a targeted search for evidence of foraging, breeding and roosting for the Black cockatoo. Roosting habitat occurs along the Arrowsmith River, however this is habitat occurs adjacent to the south east section of the application area (Western Wildlife, 2017). Western Wildlife (2017) state that the application area contains some foraging habitat for the cockatoo, however no evidence of current or past foraging activity was recorded, despite searching in several locations. DBCA (2018) advise that the survey was not a comprehensive targeted survey, so although there was no foraging evidence found, it is possible that there was evidence in the areas not surveyed or seasonal variability. There are numerous records of Carnaby's Black Cockatoo in the surrounding region, so it is likely that the vegetation within the application area is used by the species as the cockatoos are known to opportunistically forage in any areas of suitable habitat (DBCA, 2018; NatureMap, 2019). Western Wildlife (2017) advise that despite the lack of evidence, the stands of Banksia shrubland in the study area are highly likely to be used by foraging cockatoos. Feeding habitat within the range of Carnaby's Black Cockatoos is under significant pressure and as such the cumulative effect of individual proposals need to be considered under the EP Act, as the progressive loss of small areas is an on-going concern for this species (DotEE, 2019a). The loss of 74.539 hectares of Carnaby's Black Cockatoo feeding habitat will impact the species, as these vegetation types would be significant food sources for this species at specific times of the year. To compensate the loss of foraging habitat for Carnaby's Black Cockatoo, an offset is required to address the residual significant impacts of the proposed clearing. The proponent is proposing to purchase 218.46 hectares of foraging habitat to be included in conservation estate.

Western Wildlife (2017) recorded the Rainbow Bee-eater within the application area. This is a migratory species which is highly mobile and may use the application area for foraging as part of a larger territory area (DotEE, 2019b). Given that the proposed clearing will occur during the end of December/beginning of January, the Rainbow Bee-eater would have left the area for its northerly migration (DotEE, 2019b). The proposed clearing is not likely to impact the conservation significance of this species.

The Fork-tailed Swift is a non-breeding migratory species which is highly mobile and forages aerially (DotEE,

2019c). This species may utilise the application area for foraging over a larger territory area, however the proposed clearing is not likely to impact this species.

The Peregrine Falcon is a widespread bird of prey, which is highly mobile and has a very large population that appears to be secure (Western Wildlife, 2017). This species may utilise the application area for foraging, however the proposed clearing is not likely to impact this species.

The katydid *Hemisaga vepreculae* is a green flightless predatory species endemic to Western Australia (Rentz, 2010). The katydid *Phasmodes jeeba* is a species of 'stick katydid' that occurs in coastal sandplain heaths and is endemic to Western Australia (Rentz, 2010). Although no records of these species have been identified within the application area, the proposed clearing is still likely to result in some loss of habitat for the species, but is unlikely to have a significant impact on their conservation status.

The Black-striped Snake is a small snake that inhabits coastal dunes and sandplains that support heath or *Banksia* woodland (Bush *et al.* 2007). This species is likely to occur on the sandy soils of the application area, though it is probably absent from rocky areas. The linear nature of the proposed clearing is not likely to impact this species.

The Woolybush Bee is known from records on the west coast and scattered records in the southeast wheatbelt (Padil, 2017). It is often recorded in association with Woolybush (*Adenanthos cygnorum*), with additional records on species of *Grevillea* and *Banksia* (Padil, 2017). Although the Woolybush Bee may occur within the application area, the Woolybush vegetation is sparse in most parts of the application area (Western Wildlife, 2017).

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

**Methodology** Bush *et al.* (2007)  
DBCA (2018)  
DotEE (2019a)  
DotEE (2019b)  
DotEE (2019c)  
Keighery (1994)  
Mattiske (2017)  
NatureMap (2019)  
Padil (2017)  
Rentz (2010)  
Shah (2006)  
Western Wildlife (2017)

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

**Comments Proposed clearing is at variance to this Principle**

According to available databases, there are five known records of Threatened flora within the application area (NatureMap, 2019).

Mattiske (2017) undertook a targeted flora and vegetation survey over the application area from August to November 2017, and recorded four Threatened flora species within the survey area:

- *Eucalyptus crispata*;
- *Eucalyptus leprophloia*;
- *Paracaleana dixonii*; and
- *Thelymitra stellata* (Mattiske, 2017).

Mattiske (2017) identified 22 individuals of *Eucalyptus leprophloia* in a single population within the survey boundary. The area where this species was identified has been excised from the application area (Mattiske, 2017).

Mattiske (2017) identified two individuals of *Eucalyptus crispata* in a single population within the north-eastern portion of the survey boundary. The application area has been amended to avoid the known locations of this species, therefore this species is unlikely to be directly impacted by the proposed clearing.

There were 29 individuals of *Paracaleana dixonii* recorded at five populations within the survey boundary (Mattiske, 2017), however this species is unlikely to be directly impacted by the proposed clearing as the application area has been amended to avoid the known locations of this orchid.

There were 38 individuals of *Thelymitra stellata* recorded at seven locations within the survey boundary (Mattiske, 2017). The application area has been amended to avoid the known locations of this species, therefore this species is unlikely to be directly impacted by the proposed clearing.

The species *Hakea megalosperma* has been recorded within the local area and suitable habitat occurs within the application area (Western Australian Herbarium, 1998-). The species flowers during May – June, outside the survey period. However, given that this shrub grows to 1 to 2 metres high (Western Australian Herbarium, 1998-), it is unlikely that it would have been overlooked during the flora and vegetation survey.

A Threatened Flora Authorisation issued under the *Biodiversity Conservation Act 2016* will be obtained by the applicant to mulch within 10 metres of known locations of the Sandplain Duck Orchid and the Star Sun-Orchid where a larger buffer zone can not be achieved (Lattice Energy, 2019).

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

**Methodology** Lattice Energy (2019)  
Mattiske (2017)  
NatureMap (2019)  
Western Australian Herbarium (1998-)

**(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 Proposed clearing is not at variance to this Principle**

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).

A flora and vegetation survey of the application area did not identify any TECs (Mattiske, 2017).

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

**Methodology** Mattiske (2017)

GIS Database:  
- Threatened and Priority Ecological Communities - Boundaries

**(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 Proposed clearing is at variance to this Principle**

The application area falls within the Geraldton Sandplains Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 45 percent of the pre-European vegetation still exists in this IBRA Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 49, 378 and 379. These vegetation associations have approximately 36, 64 and 24 percent respectively of their pre-European extents remaining in the Geraldton Sandplains IBRA bioregion (Government for Western Australia, 2019).

The Shire of Three Springs and Shire of Irwin retain approximately 22 and 49 percent of their pre-European extents of native vegetation cover. The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities below 30 percent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DBCA Managed Lands (and post clearing %)
IBRA Bioregion - Geraldton Sandplains	3,163,038	1,404,424	~44.78%	Depleted	18.24 (40.46)
IBRA Subregion - Lesueur Sandplain	1,171,775	502,984	~42.92%	Depleted	18.36 (42.25)
Local Government – Shire of Three Springs	265,736	58,018	~21.83%	Vulnerable	1.94 (8.68)
Local Government – Shire of Irwin	236,968	117,014	~49.38%	Depleted	12.17 (24.48)
Beard vegetation associations - State					
49	52,492	26,113	~49.75%	Depleted	22.38 (44.46)
378	95,109	61,032	~64.17%	Least Concern	14.14 (22.00)
379	547,737	129,737	~23.69%	Vulnerable	5.38 (22.29)
Beard vegetation associations - Bioregion					
49	39,718	14,490	~36.48%	Depleted	8.79 (24.05)
378	95,109	61,032	~64.17%	Least Concern	14.14 (22.00)
379	546,507	129,496	~23.70%	Vulnerable	5.39 (22.32)
Beard vegetation associations - subregion					
49	33,139	13,619	~41.10%	Depleted	10.54 (25.59)
378	90,923	60,668	~66.72%	Least Concern	14.79 (22.13)
379	370,030	111,632	~30.17%	Depleted	5.95 (19.26)

\* Government of Western Australia (2019)

\*\* Department of Natural Resources and Environment (2002)

Whilst it is acknowledged that Beard vegetation associations 49 and 379 are above recognised thresholds (Government of Western Australia, 2019), assessment of aerial imagery confirms that the local area has been largely cleared for agricultural purposes (GIS Database). The vegetation under application forms part of a significant area of remnant native vegetation, however the nature of the proposed clearing (width of clearing of access tracks, coarse linear line spacing and mulching method) are not likely to result in large areas of disturbed or open land.

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

**Methodology** Commonwealth of Australia (2001)  
Department of Natural Resources and Environment (2002)  
Government of Western Australia (2019)

GIS Database:  
- IBRA Australia  
- 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 at variance to this Principle**

There are no watercourses or wetlands within the application area (Lattice Energy, 2018a; GIS Database). The closest watercourse (Arrowsmith River) is located 50 to 100 metres south-east of the application area (GIS Database).

The flora and vegetation survey by Mattiske (2017) did not identify any riparian vegetation within the application area.

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

**Methodology** Lattice Energy (2018a)  
Mattiske (2017)

GIS Database:  
- Hydrography, linear  
- Imagery

**(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 nature of the proposed clearing (width of clearing of access tracks, coarse linear line spacing and raised blade mulching method) are not likely to result in large areas of disturbed or open land (Lattice Energy, 2018a).

The sandy nature of the soils within the application area (GIS Database) indicate that there is likely to be a moderate wind erosion risk due to the relative ease at which these materials may be transported by wind, however the nature of clearing of native vegetation within the application area is not likely to result in appreciable land degradation.

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

**Methodology** Lattice Energy (2018a)

GIS Database:  
- Soils, Statewide

**(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**

There are no conservation areas in the vicinity of the application area. The nearest conservation area is an un-named Nature Reserve vested with the Conservation Commission of WA (GIS Database). The un-named Nature Reserve is located between the application areas, approximately two kilometres southern of the application area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.

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

**Methodology** GIS Database:  
- DPaW 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**

The application area is not located within a Public Drinking Water Source Area (GIS Database). The application area is located within the proclaimed Arrowsmith groundwater area under the *Rights in Water and Irrigation Act 1914* (GIS Database). Any groundwater extraction and/or taking or diversion of surface water for purposes other than domestic and/or stock watering is subject to licence by the Department of Water and Environmental Regulation.

The application area has a groundwater salinity that is fresh to brackish (500 – 1,000 milligrams/Litre Total Dissolved solids (TDS)) (GIS Database). With high annual evaporation rates and low annual rainfall, there is little recharge into regional groundwater (BoM, 2018). The proposed clearing of 74.539 hectares of native vegetation is unlikely to further deteriorate the quality of underground water (GIS Database).

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

**Methodology** BoM (2018)

GIS Database:

- Geodata, Lakes
- Groundwater Salinity, Statewide
- Hydrography, Linear
- Public Drinking Water Source Areas
- RIWI Act, Groundwater Areas

**(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 a Mediterranean climate, with an annual average rainfall of approximately 402.8 millimetres per year (BoM, 2018; CALM, 2002). Based on an average annual evaporation rate of 2,400 - 2,800 millimetres (BoM, 2018), any surface water resulting from rainfall events is likely to be relatively short lived.

The porous and permeable soil within the application area allows rainwater to infiltrate to the water table rather than running off the land surface (Lattice Energy, 2018a).

Given the size of the area to be cleared (74.539 hectares) compared to the size of the Arrowsmith catchment area (160,395 hectares) (GIS Database) it is not likely that the proposed clearing will lead to an appreciable increase in run off, and subsequently 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 (2018)  
CALM (2002)  
Lattice Energy (2018a)

GIS Database:

- Hydrographic Catchments - Catchments
- Hydrography, Linear

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

**Comments**

The clearing permit application was advertised on 3 September 2018 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There are no native title claims over the area under application (DPLH, 2019). However, the petroleum 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 (DPLH, 2019). 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 Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

**Methodology** DPLH (2019)

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