



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8068/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Wodgina Lithium Pty Ltd

1.3. Property details

Mining Lease 45/50
Mining Lease 45/381
Mining Lease 45/949
Miscellaneous Licence 45/108
Local Government Area: Town of Port Hedland
Colloquial name: Wodgina Lithium Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
240		Mechanical Removal	Gas pipeline and supporting infrastructure.

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 11 October 2018

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description The vegetation of the application area is broadly mapped as the following Beard vegetation associations:

93: Hummock grasslands, shrub steppe; kanji over soft spinifex;
589: Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex;
626: Hummock grasslands, shrub-steppe; kanji over soft spinifex & *Triodia brizoides*; and
647: Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* over soft spinifex (GIS Database).

A flora and vegetation survey over the application area was conducted by 360 Environmental during January - February 2018, and a targeted flora and vegetation was conducted in June 2018. Thirteen vegetation associations were recorded within the application area (360 Environmental, 2018a):

- AaAbTI:** *Acacia inaequilatera*, *Acacia ancistrocarpa* tall sparse shrubland over *Grevillea wickhamii* subsp. *macrodongta*, *Acacia bivenosa* mid sparse shrubland over *Halganina solanacea*, *Bonamia erecta* low isolated clumps of shrubs over *Triodia lanigera* low tussock grassland;
- AhAiTe:** *Atalaya hemiglauca*, *Acacia inaequilatera*, *Acacia pyrifolia* var. *pyrifolia* tall sparse shrubland over *Hakea lorea* subsp. *lorea*, *Carissa lanceolata* mid sparse shrubland over *Triodia epactia* mid tussock grassland;
- AiGwTI:** *Acacia inaequilatera*, *Grevillea wickhamii* subsp. *macrodongta* tall isolated clumps of shrubs over *Acacia ancistrocarpa*, *Acacia bivensoa*, *Hakea lorea* subsp. *lorea* mid isolated clumps of shrubs over *Acacia stellaticeps*, *Bonamia erecta* low isolated shrubs over *Triodia lanigera* tussock grassland;
- AmTeTI:** *Acacia maitlandii*, *Grevillea wickhamii* subsp. *macrodongta* mid sparse shrubland over *Acacia stellaticeps*, *Tephrosia* sp. Bungaroo Creek (M.E. Trudgen 11601), *Pluchea tetranthera* low sparse shrubland over *Triodia epactia*, *Triodia lanigera* mid tussock grassland;
- CcAiMI:** *Corymbia candida* subsp. *lautifolia* low isolated trees over *Acacia inaequilatera*, *Acacia sericophylla* tall isolated shrubs over *Melaleuca lasiandra*, *Acacia sphaerostachya*, *Acacia ancistrocarpa* mid isolated shrubs over *Acacia stellaticeps* low isolated shrubs over *Triodia schinzii*, *Triodia lanigera* mid tussock grassland;
- CcEvTe:** *Corymbia candida* subsp. *lautifolia*, *Eucalyptus victrix* low woodland over *Acacia coleii* var. *coleii*, *Acacia ancistrocarpa*, *Acacia trachycarpa* tall sparse shrubland over *Acacia pyrifolia* var. *pyrifolia*, *Acacia sphaerostachya*, *Carissa lanceolata* mid isolated clumps of trees over *Acacia stellaticeps*, *Pluchea tetranthera*, *Cullen martinii* low isolated shrubs over *Triodia epactia* mid closed tussock grassland;

7. ChAiTs: *Corymbia hamersleyana* low isolated trees over *Acacia inaequilatera*, *Acacia tumida* var. *pilbariensis* tall sparse shrubland over *Acacia sericophylla*, *Acacia acradenia*, *Acacia ancistrocarpa* mid open shrubland over *Acacia stellaticeps*, *Bonamia erecta*, *Corchorus parviflorus* low shrubland over *Triodia* spp. mid tussock grassland;
8. ChAtTe: *Corymbia hamersleyana* low isolated trees over *Acacia tumida* var. *pilbariensis*, *Acacia inaequilatera* tall sparse shrubland over *Acacia acradenia*, *Acacia ancistrocarpa*, *Grevillea wickhamii* subsp. *macrodonta* mid sparse shrubland over *Triodia epactia* tussock grassland;
9. ChCzAt: *Corymbia hamersleyana*, *Corymbia zygophylla* low open woodland over *Acacia trachycarpa*, *Acacia bivenosa*, *Acacia acradenia* tall shrubland over *Hakea lorea* subsp. *lorea*, *Petalostylis labicheoides*, *Acacia ancistrocarpa* mid isolated clumps of shrubs over *Acacia stellaticeps* low open shrubland over *Triodia epactia* closed tussock grassland;
10. CzGwAs: *Corymbia zygophylla* low isolated clumps of trees over *Acacia trachycarpa*, *Hakea lorea* subsp. *lorea* mid isolated clumps of shrubs over *Acacia stellaticeps* low shrubland over *Triodia epactia*, *Triodia schinzii* tussock grassland;
11. CzAtTe: *Corymbia zygophylla* low isolated clumps of trees over *Acacia trachycarpa*, *Hakea lorea* subsp. *lorea* mid isolated clumps of shrubs over *Acacia stellaticeps* low shrubland over *Triodia epactia*, *Triodia schinzii* tussock grassland;
12. HINdTe: *Hakea lorea* subsp. *lorea*, *Carissa lanceolata* tall isolated shrubs over *Rhynchosia minima*, *Neptunia dimorphantha*, *Corchorus parviflorus* low isolated shrubs over *Triodia epactia* tussock grassland; and
13. MIAiTs: *Melaleuca lasiandra* low woodland over *Acacia inaequilatera*, *Hakea lorea* subsp. *lorea*, *Senna artemisioides* subsp. *oligophylla* mid isolated shrubs over *Acacia stellaticeps*, *Corchorus parviflorus*, *Pluchea ferdinandi-muelleri* low isolated shrubs over *Triodia schinzii*, *Triodia lanigera* open tussock grassland.

Clearing Description	Wodgina Lithium Project. Wodgina Lithium Pty Ltd proposes to clear up to 240 hectares of native vegetation within a boundary of approximately 1,599 hectares, for the purpose of a gas pipeline and supporting infrastructure. The project is located approximately 35 kilometres southwest of Port Hedland and runs in a south-easterly direction for approximately 80 kilometres.
Vegetation Condition	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994); To Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).
Comment	The initial flora and vegetation survey over the application area was conducted outside of the of the recommended survey period for the Eremaean province (6-8 weeks post wet season, March - June), between January - February 2018. Therefore, further survey work was required during the recommended survey period, and subsequently undertaken over the application area in June 2018. The vegetation condition of the application area ranged from Very Good to Completely Degraded, with the majority considered to be in Very Good condition (360 Environmental, 2018a).

3. Assessment of application against Clearing Principles

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

Comments	<p>Proposal is not likely to be at variance to this Principle</p> <p>The clearing permit application area is located within the Chichester and Roebourne subregions of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion (GIS Database). The majority of the application area is located within the Chichester subregion, which is characterised by undulating Archaean granite and basalt plains including significant areas of basaltic ranges. Plains support a shrub steppe characterised by <i>Acacia pyrifolia</i> over <i>Triodia pungens</i> hummock grasslands, while <i>Eucalyptus leucophloia</i> tree steppes occur on the ranges (CALM, 2002). The northern extent of application area is located within the Roebourne subregion, which is characterised by Quaternary alluvial and older colluvial coastal and sub-coastal plains, with a grass savanna of mixed bunch and hummock grasses, and dwarf shrub steppe of <i>Acacia translucens</i> or <i>Acacia pyrifolia</i> and <i>Acacia inaequilatera</i>. Resistant linear ranges of basalts occur across the coastal plains. These uplands are dominated by <i>Triodia</i> hummock grasslands. Ephemeral drainage lines support <i>Eucalyptus</i> woodlands. Samphire, <i>Sporobolus</i> grasslands and mangal occur on the marine alluvial flats and river deltas. The islands are Quaternary sand accumulations, basalt and/or limestone (CALM, 2002).</p> <p>A total of 13 vegetation associations have been mapped within the permit area (360 Environmental, 2018a; 360 Environmental, 2018c). None of the vegetation associations mapped within the application area are considered to represent any listed TECs or PECs (360 Environmental, 2018a; 360 Environmental, 2018c).</p> <p>The field survey of the gas pipeline application area recorded a total of 142 species, from 67 genera and 31 families within thirteen vegetation associations (360 Environmental, 2018a). A desktop review identified three Priority 3 flora species to likely occur within the gas pipeline application area; <i>Euphorbia clementii</i>, <i>Gymnanthera cunninghamii</i> and <i>Heliotropium muticum</i>, based on the availability of suitable habitat and previous records occurring within 15 kilometres of the gas pipeline application area (360 Environmental, 2018a). One Priority 3 species, <i>Euphorbia clementii</i> was recorded from two populations within the gas pipeline application area, of which one was a large emergent population comprising over 500 individuals within a recently burnt drainage line (360 Environmental, 2018a). <i>Euphorbia clementii</i> is known from numerous records over a considerable</p>
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range within the Chichester and Roebourne subregions (Western Australian Herbarium, 2018). The proposed clearing of the two populations from within the gas pipeline application area is unlikely to have a significant impact in terms of their regional conservation status. The overall floristic diversity of vegetation associations mapped is considered to be representative of the Pilbara bioregion, and relatively widespread within the general region surrounding the application area (360 Environmental, 2018a).

A total of three weed species were recorded during the field surveys over the application area. These species were Kapok (*Aerva javanica*), Buffel Grass (*Cenchrus ciliaris*) and Spiked Malvastrum (*Malvastrum americanum*) (360 Environmental, 2018a; 360 Environmental, 2018c; 360 Environmental, 2018d). Six other weed species were also recorded from other field surveys within 1.5 kilometres of the application area (Woodman, 2018). Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Six broad fauna habitat types were described from within the application area (Stantec, 2018). Four of these fauna habitat types are considered to be significant for native fauna. Of the four significant fauna habitat types, only one was identified as being limited in extent (Stantec, 2018). Based on a desktop assessment of current biodiversity lists (up to 50 kilometres from the application area) and previous biodiversity survey reports (up to 75 kilometres from the application area), 357 native fauna species were identified to potentially occur within the application area, comprising 38 mammals, 197 birds, 122 reptiles and 11 amphibians (Stantec, 2018). Given the linear nature of the gas pipeline application area, and similar habitat values present in the surrounding area, the proposed clearing is not likely to support a higher level of fauna diversity than the immediate surrounding environment (360 Environmental, 2018b).

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

Methodology CALM (2002)
360 Environmental (2018a)
360 Environmental (2018c)
360 Environmental (2018d)
Western Australian Herbarium (2018)
Woodman (2018)

GIS Database:
- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Flora
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened Fauna

(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 may be at variance to this Principle

Stantec undertook a review of previous fauna surveys over the vicinity of the application area and the wider locality of the Wodgina Lithium Project to consolidate fauna habitat mapping and identify fauna habitats of significance within the application area (Stantec, 2018).

Six broad fauna habitat types are described over the application area (360 Environmental, 2018b; Stantec, 2018):

- Spinifex sandplain;
- Shrubland over spinifex;
- Low vegetation with ephemeral areas;
- Spinifex stony plain;
- Stony rises; and
- Drainage lines.

Based on known records and habitats present, there are five fauna species of conservation significance considered to likely occur within the application area, with an additional four species of conservation significance being confirmed (recorded) from within the application area (360 Environmental, 2018b; Stantec, 2018). The five species considered to likely occur within the application area are the Grey Falcon (*Falco hypoleucos*; Vulnerable), Peregrine Falcon (*Falco peregrinus*; Schedule 7); Spectacled hare-wallaby (*Lagorchestes conspicillatus leichardti*; Priority 3); Long-tailed Dunnart (*Sminthopsis longicaudata*; Priority 4); and Western Pebble-mound Mouse (*Pseudomys chapmani*; Priority 4). The four species of conservation significance that have been confirmed to occur within the application area are listed below (360 Environmental, 2018a; Stantec, 2018):

- Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia*) – Vulnerable;
- Greater Bilby (*Macrotis lagotis*) – Vulnerable;
- Brush-tailed Mulgara (*Dasyercus blythi*) – Priority 4; and
- Fork-tailed Swift (*Apus pacificus*) – Migratory.

Of the six fauna habitats identified within the application area, four are considered to be significant for native fauna including; spinifex stony plain, spinifex sandplain, shrubland over spinifex and low vegetation with ephemeral areas. Of these four significant fauna habitat types, the low vegetation with ephemeral areas fauna habitat type is limited in extent, and therefore considered to be the most significant for fauna (Stantec, 2018).

The low vegetation with ephemeral areas habitat occurs exclusively within the northern portion of the gas pipeline application area (360 Environmental, 2018b; 360 Environmental, 2018c). Evidence of Bilby was found in this habitat type, and it may also provide sporadic opportunities for amphibians and wetland bird species when inundated after significant rainfall events, including species listed as Marine and Migratory under the *Environmental Protection and Biodiversity Conservation Act 1999*, such as the Oriental Pratincole (*Glareola maldivarum*), Red-necked Stint (*Calidris ruficollis*), Wood Sandpiper (*Tringa glareola*), Common Greenshank (*Tringa nebularia*) and Marsh Sandpiper (*Tringa stagnatilis*) (360 Environmental, 2018c).

The spinifex stony plain, spinifex sandplain, and shrubland over spinifex fauna habitat types are also considered to be significant for native fauna due to the variation in density of vegetation, however, they are well represented in the Pilbara bioregion (360 Environmental, 2018c). The significance of the spinifex stony plain and spinifex sandplain fauna habitat is closely dependent on the fire history. Areas that retain a mosaic of fire ages often provide the best habitat as it provides a variety of good foraging area in newly burnt areas, and good shelter or breeding areas within the long, unburnt vegetation. The fire age of the application area ranged widely from less than a year to greater than ten years (360 Environmental, 2018a). The spinifex sandplain and shrubland over spinifex fauna habitat types also contain sandy substrates, which provide suitable habitat for burrowing species including species of conservation significance such as the Bilby and Brush-tailed Mulgara (360 Environmental, 2018b; 360 Environmental, 2018c). Variation in density of *Acacia* provides good habitat diversity and good foraging opportunities (Stantec, 2018).

The ability for the drainage line and stony rises fauna habitat types to support and provide refuge opportunities to a diverse assemblage of fauna are considered to be variable (Stantec, 2018). However, the drainage line fauna habitat type functions as linear corridors to connect multiple fauna habitats. Drainage lines may be of temporary significance after periods of significant rainfall, as they are likely to retain water longer than the surrounding environment (Stantec, 2018). During these times, drainage lines may provide foraging opportunities for conservation significant fauna such as the Northern Quoll, Pilbara Leaf-nosed Bats, Ghost Bats and Pilbara Olive Python; and the trees and hollows may be used as nests for birds within drainage lines (360 Environmental, 2018b).

The proposed clearing is unlikely to impact any of species at a regional scale, or be significant enough to cause conservation significant fauna species to become eligible for listing at a high threat ranking (DBCA, 2018). However, the clearing may directly impact individual fauna, and at a local scale by reduction of appropriate habitat (DBCA, 2018). Potential impacts to the Bilby and Brush-tailed Mulgara as a result of the proposed clearing of the gas pipeline application area may be minimised by the implementation of a fauna management condition.

The short range endemics (SRE) reconnaissance survey within the gas pipeline application area recorded 23 invertebrates from three classes and five orders, with five taxa being potentially classified as SRE, pending further identification (360 Environmental, 2018b). The *Buddelundia* isopods were identified as being the most likely to represent potential SRE species (360 Environmental, 2018b). However, they were found in habitats unlikely to support species with restricted ranges, such as the *Triodia* grasslands that is widespread and laterally continuous in the Pilbara region (360 Environmental, 2018b; GIS Database). Habitats more likely to contain SRE species include isolated areas that can maintain residual moisture refuge such as rocky outcrops, riparian zones, lake edges and deep gullies. Given the linear nature of the gas pipeline application area, and similar habitat values present in the surrounding area, the proposed clearing is not likely to result in local extinction of any species (360 Environmental, 2018b).

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

Methodology 360 Environmental (2018a)
360 Environmental (2018b)
360 Environmental (2018c)
DBCA (2018)
Stantec (2018)

GIS Database:
- Imagery
- Pre-European Vegetation
- Threatened Fauna

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

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

There are no known records of Threatened flora within the application area (GIS Database). The flora surveys of the application area did not record any species of Threatened flora (360 Environmental, 2018a; 360 Environmental, 2018c).

The vegetation associations within the application area is likely to be widespread within the local region (GIS Database), and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened (rare) flora.

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

Methodology 360 Environmental (2018a)
360 Environmental (2018c)

GIS Database:
- Pre-European Vegetation
- Threatened and Priority Flora

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

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

There are no known Threatened Ecological Communities (TECs) 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 (360 Environmental, 2018a; 360 Environmental, 2018c).

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

Methodology 360 Environmental (2018a)
360 Environmental (2018c)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

(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 falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Pilbara Bioregion (Government of Western Australia, 2018). The application area is broadly mapped as Beard vegetation associations 93: Hummock grasslands, shrub steppe; kanji over soft spinifex; 589: Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex; 626: Hummock grasslands, shrub-steppe; kanji over soft spinifex & *Triodia brizoides*; and 647: Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* over soft spinifex (GIS Database). Approximately 97-99% of the pre-European extent of each of these vegetation associations remains uncleared at both the state and bioregional level (Government of Western Australia, 2018).

Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DBCA managed lands
IBRA Bioregion – Pilbara	17,808,657	17,733,583	~99	Least Concern	10.12
Beard vegetation associations – WA					
93	3,044,309	3,040,640	~99	Least Concern	1.96
589	807,698	802,713	~99	Least Concern	1.9

626	117,724	117,198	~99	Least Concern	15.59
647	195,860	191,711	~98	Least Concern	-
Beard vegetation associations – Pilbara Bioregion					
93	3,042,114	3,038,472	~99	Least Concern	1.96
589	728,768	724,696	~99	Least Concern	2.10
626	117,724	117,198	~99	Least Concern	15.59
647	195,860	191,711	~97	Least Concern	-

* Government of Western Australia (2018)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2018)

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 at variance to this Principle**

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Numerous minor creek line passes through the application area (GIS Database). Creek lines in the region are dry for most of the year, only flowing immediately following significant rainfall (Van Vreeswyk et al., 2004).

Vegetation associations CcEvTe and ChAtTe were identified as being associated with drainage lines (360 Environmental, 2018a). These vegetation associations may compromise refugial habitat for some fauna when creek lines are inundated following significant rainfall. Potential impacts of the proposed clearing to vegetation growing in association with watercourses may be minimised by the implementation of a watercourse management condition.

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

Methodology 360 Environmental (2018a)

GIS Database:

- DoW Surface Water Bodies
- DoW Surface Water Lines
- Hydrography, Lakes
- Hydrography, linear

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

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

The application area lies within the Boolgeeda, Capricorn, Mallina, Ruth and Uaroo land systems (GIS Database). These land systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development).

The Boolgeeda land system is described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands. This land system is not generally susceptible to erosion (Van Vreeswyk et al., 2004).

The Capricorn land system is described as hills and ridges of sandstone and dolomite supporting shrubby hard and soft spinifex grasslands. This land system is resistant to erosion (Van Vreeswyk et al., 2004).

The Mallina land system is described as sandy surfaced alluvial plains supporting soft spinifex (and occasionally hard spinifex) grasslands. This land system is moderately to highly susceptible to erosion if vegetative cover is seriously depleted (Van Vreeswyk et al., 2004).

The Ruth land system is described as hills and ridges of volcanic and other rocks supporting hard spinifex (occasionally soft spinifex) grasslands. This land system is not generally susceptible to erosion (Van Vreeswyk et al., 2004).

The Uaroo land system is described as broad sandy plains supporting shrubby hard and soft spinifex grasslands. This land system is not generally susceptible to erosion (Van Vreeswyk et al., 2004).

The proposed clearing of up to 240 hectares of native vegetation within a boundary of approximately 1,599 hectares, for the purpose of a gas pipeline and supporting infrastructure is unlikely to cause appreciable land degradation. However the Mallina land system, that is moderate to highly susceptible to erosion, accounts for approximately 363 hectares (22%) of the application area. The impact of erosion that may be caused by the proposed native vegetation clearing of the Mallina land system may be minimised by the implementation of a staged clearing condition.

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

Methodology Van Vreeswyk et al. (2004)

GIS Database:
- Landsystem Rangelands

(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 DBCA (formerly DPaW) managed land is the Mungaroona Nature Reserve which is located approximately 57 kilometres southwest 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:
- DBCA Interested Lands and Waters
- DBCA Legislated Lands and Waters

(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**

Approximately 13 kilometres of the northern extent of the application area (approximately 260 hectares of the permit boundary) is located within the Priority 1 area of Yule River Water Reserve Public Drinking Water Source Area (PDWSA), proclaimed under the *Country Areas Water Supply Act 1947* (GIS Database).

The groundwater within the application area ranges between 500 – 3,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be marginal to brackish groundwater. It would not be expected that the proposed clearing of 240 hectares within a permit boundary of 1,599 hectares would cause salinity levels within the application or surrounding area to alter. Advice from the Department of Water and Environmental Regulation (DWER) (2018) is that provided activities are carried out in accordance with relevant DWER Water Quality Protection Guidelines and Water Quality Protection Notes (WQPN), the proposed clearing is not likely to have a significant impact and cause deterioration on the quality of groundwater (DWER, 2018). Recommended notes include: WQPN 10 Contaminant spills – emergency response; WQPN 83 Infrastructure corridors near sensitive water resources; and WQPN 84 Rehabilitation of disturbed land in PDWSAs.

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall (Van Vreeswyk et al., 2004). The proposed clearing is unlikely to result in significant changes to surface water flows.

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

Methodology DWER (2018)
Van Vreeswyk et al. (2004)

GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, Linear
- Public Drinking Water Source 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 climate of the region is semi-arid, with a low average rainfall of approximately 319.2 millimetres per year, and pan evaporation rates of 3,200 – 3,600 millimetres per year (BOM, 2018).

There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events (Van Vreeswyk et al., 2004). However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.

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

Methodology BOM (2018)
Van Vreeswyk et al. (2004)

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 28 May 2018 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. The application was subsequently readvertised on 24 September 2018 to include additional tenements. No submissions were received in relation to this application.

It is noted that the proposed clearing may impact on the greater bilby which is a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of the Environment and Energy for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of the Environment and Energy for further information regarding notification and referral responsibilities under the EPBC Act.

There is one native title claim (WC1999/003) over the area under application (DPLH, 2018). This claim has been registered with the National 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 several registered Aboriginal Sites of Significance within the application area (DPLH, 2018). 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 (2018)

4. References

- 360 Environmental (2018a) Wodgina Gas Pipeline Detailed Flora and Vegetation Survey. Report for Mineral Resources Limited, prepared by 360 Environmental Pty Ltd, July 2018.
- 360 Environmental (2018b) Wodgina Gas Pipeline Targeted Fauna Survey. Report for Mineral Resources Limited, prepared by 360 Environmental Pty Ltd, July 2018.
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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DBCA	Department of Biodiversity Conservation and Attractions, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DBCA and DWER)
DEE	Department of the Environment and Energy, Australian Government
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora
DoE	Department of the Environment, Australian Government (now DEE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DEE)
DWER	Department of Water and Environmental Regulation, Western Australia
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2017) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T	<p>Threatened species: Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).</p> <p>Threatened fauna is that subset of ‘Specially Protected Fauna’ declared to be ‘likely to become extinct’ pursuant to section 14(4) of the <i>Wildlife Conservation Act 1950</i>.</p> <p>Threatened flora is flora that has been declared to be ‘likely to become extinct or is rare, or otherwise in need of special protection’, pursuant to section 23F(2) of the <i>Wildlife Conservation Act 1950</i>.</p>
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The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

- CR Critically endangered species**
Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- EN Endangered species**
Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- VU Vulnerable species**
Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- EX Presumed extinct species**
Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
- IA Migratory birds protected under an international agreement**
Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- CD Conservation dependent fauna**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- OS Other specially protected fauna**
Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- P Priority species**
Species which are poorly known; or
Species that are adequately known, are rare but not threatened, and require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
- P1 Priority One - Poorly-known species:**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
- P2 Priority Two - Poorly-known species:**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
- P3 Priority Three - Poorly-known species:**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining

areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4

Priority Four - Rare, Near Threatened and other species in need of monitoring:

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.