



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8399/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: EII Gas Transmission Service WA (Operations) Pty Ltd

1.3. Property details

Property: Pipeline Licence PL60
Pipeline Licence PL63
Local Government Area: Shire of East Pilbara
Town of Port Hedland
Colloquial name: Telfer Gas Pipeline

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
265.449		Mechanical Removal	Gas Pipeline Maintenance

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 12 September 2019

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:

- 41: Shrublands; teatree scrub;
- 93: Hummock grasslands, shrub steppe; kanji over soft spinifex;
- 101: Hummock grasslands, shrub steppe; *Acacia pachycarpa* over soft spinifex;
- 117: Hummock grasslands, grass steppe; soft spinifex;
- 134: Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills;
- 157: Hummock grasslands, grass steppe; hard spinifex, *Triodia wiseana*;
- 171: Hummock grasslands, low tree steppe; snappy gum over soft spinifex and *Triodia brizoides*;
- 173: Hummock grasslands, shrub steppe; kanji over soft spinifex and *Triodia wiseana* on basalt;
- 589: Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex;
- 619: Medium woodland; river gum (*Eucalyptus camaldulensis*); and
- 647: Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* over soft spinifex (GIS Database).

A flora and vegetation survey was conducted over the application area by Hart, Simpson and Associates Pty Ltd (2001) in September and October, 2001. The following vegetation associations were broadly described within the application area (Hart, Simpson and Associates Pty Ltd, 2001):

Acacia shrubland over *Triodia pungens* grassland on sandplains with occasional granites, dominated by *Acacia translucens* close to the coast, and *Acacia inaequilatera*, *Acacia coleii*, *Acacia tumida* and *Acacia ancistrocarpa* further inland. Scattered shrubs of *Acacia hilliana*, *Acacia synchronicia*, *Acacia pyrifolia* and *Tribulus platypterus*, with occasional *Eucalyptus leucophloia* over *Triodia pungens* grasslands are associated with stony hills, and areas associated with granite outcrops are characterised by the presence of *Terminalia canescens*. Inland dune swales are vegetated by scattered shrubs of *Acacia ancistrocarpa* and *Acacia translucens* over *Triodia basedowii*. Dunes are commonly dominated by *Triodia basedowii* at the base and transitioning into *Triodia schinzii* on the upper slopes and summits. Occasional *Corymbia chippendalei* are present on dune summits, with scattered shrubs, herbs and grasses present across dunes. Low-lying areas with more clayey soil are present throughout the application area, characterised by the presence of *Corymbia deserticola* and *Eucalyptus victrix* closer to the coast, and *Corymbia opaca*, *Corymbia flavescens* and *Corymbia aspera* further inland, with the addition of *Eucalyptus obtusa*, *Melaleuca leucadendra* and *Melaleuca glomerata* in areas associated with drainage lines.

Clearing Description Telfer Gas Pipeline.
EII Gas Transmission Service WA (Operations) Pty Ltd proposes to clear up to 265.449 hectares of native vegetation, for the purpose of gas pipeline maintenance. The project is located approximately 12.5 kilometres south of Port Hedland, within the Town of Port Hedland and extends south-east to the Telfer gold-copper mine, within the Shire of East Pilbara.

Vegetation Condition Pristine: No obvious signs of disturbance (Keighery, 1994).
To:
Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).

Comment The vegetation condition was not derived, however Hart, Simpson and Associates Pty Ltd (2001) described the application area as passing through very remote areas. Therefore, it is expected that the vegetation condition would range from pristine, in areas along the pipeline that are surrounded by intact remnant vegetation where regrowth after initial clearing has progressed to a stable state, to very good, in areas close to disturbed areas such as Port Hedland and Telfer. The pipeline was previously cleared for construction in 2003/2004 and has since been rehabilitated.

The proposed clearing is for the maintenance of line of sight between pipeline markers, maintenance of access tracks and for integrity dig requirements along the Telfer Gas Pipeline, constructed in 2004. The pre-existing pipeline is 443 kilometres long, within a 20 metre wide pipeline corridor. Clearing will be restricted to areas previously cleared for the pipeline construction and is to be a total width of six metres to maintain line of sight. Vegetation management along the pipeline is a requirement of the *Petroleum Pipeline Act 1969* through the Pipeline Licence and AS2885 for pipeline safety and integrity.

3. Assessment of application against Clearing Principles

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

Comments **Proposal may be at variance to this Principle**

The clearing permit application area intersects the MacKay and McLarty subregions of the Great Sandy Desert Bioregion, the Rudall subregion of the Little Sandy Desert Bioregion and the Roebourne Plains and Chichester subregions of the Pilbara Bioregion Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). **Mackay and McLarty:** the vegetation within Mackay and McLarty sub-regions are characterised as having mainly tree steppe grading to shrub steppe; comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and bloodwood (*Corymbia* species), and shrubs of *Acacia* species, *Grevillea wickhamii* and *Grevillea refracta*, on Quaternary red longitudinal sand dune fields overlying Jurassic and Cretaceous sandstones of the Canning and Armadeus Basins (CALM, 2002). Gently undulating lateritised uplands support shrub steppe such as *Acacia pachycarpa* shrublands over *Triodia pungens* hummock grass (CALM, 2002).

Rudall: the Rudall subregion is characterised by sparse shrub-steppe over *Triodia basedowii* on stony hills, with river gum communities and bunch grasslands on alluvial deposits in and associated with ranges, extensive areas of tussock grass associated with footslopes, and extensive *Triodia* hummock grasslands on hills and surrounding plains (CALM, 2002).

Roebourne: this sub-region is characterised by quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *Acacia pyriformis* and *Acacia inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite (CALM, 2002).

Chichester: the Chichester subregion is characterised by undulating Archaean granite and basalt plains with significant areas of basaltic ranges, supporting shrub steppe of *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands on plains, *Eucalyptus leucophloia* tree steppes on ranges, and drainage via numerous rivers occurring in the north (CALM, 2002).

A flora and vegetation assessment of the application area was conducted by Hart, Simpson and Associates Pty Ltd (2001) over ten days in September and October 2001. The vegetation was broadly described, but no vegetation mapping was undertaken. Vegetation was described as consisting mainly of sandplains with shrubs over spinifex, a few stony hills and granite rocks, some Pindan (trees, shrubs and spinifex) in the north, and swale/sand dune areas with shrubs over spinifex in the desert (Hart, Simpson and Associates Pty Ltd, 2001). A number of rivers and creeks were also present (Hart, Simpson and Associates Pty Ltd, 2001). Two years after initial clearing occurred for pipeline construction, rehabilitation was noted to be progressing well with a diverse mixture of native species recolonising the area and providing a consistent plant cover of young, established growth (Coffey, 2007). It was noted that in many areas revegetation had progressed to a point where it was difficult to distinguish the pipeline corridor from adjacent undisturbed areas (Coffey, 2007). After approximately 15 years of growth since initial clearing, it is expected that the majority of the application area would now resemble adjacent undisturbed vegetation. No Priority or Threatened Ecological Communities were identified as potentially occurring within the application area, and none were identified during the field assessment (GIS Database; Hart, Simpson and Associates Pty Ltd, 2001; Kingfisher Environmental, 2019a).

A total of 264 flora species from 136 genera and 53 families were recorded during the field assessment of the application area, including three Priority species (APA, 2019; Hart, Simpson and Associates Pty Ltd, 2001). Vegetation was relatively dry, limited ephemeral species were present, and there was limited flowering, suggesting the survey was not conducted at a suitable time of year (Hart, Simpson and Associates Pty Ltd, 2001). A desktop assessment of the application area identified no Threatened flora species and 57 Priority flora species previously recorded within 50 kilometres of the application area (Kingfisher Environmental, 2019a). Of the species identified in the desktop assessment, 12 species were assessed as having a high likelihood of occurring within the application area; *Tephrosia rosea* var. Port Hedland (A.S. George 1114) (P1),

Goodenia hartiana (P2), *Comesperma sabulosum* (P3), *Corynotheca asperata* (P3), *Croton aridus* (P3), *Eragrostis crateriformis* (P3), *Euphorbia clementii* (P3), *Heliotropium muticum* (P3), *Nicotiana umbratica* (P3), *Rothia indica* subsp. *australis* (P3), *Bulbostylis burbridgeae* (P4) and *Goodenia nuda* (P4), and an additional 16 species as having a medium likelihood of occurring (Kingfisher Environmental, 2019a). Three Priority flora species were recorded during the field assessment of the application area, *Goodenia lyrata* (P3, previously P1), *Goodenia hartiana* (P2) and *Fuirena incrassata* (P3), and were confined to low lying areas or swales (Hart, Simpson and Associates Pty Ltd, 2001). One species, *Stemodia linophylla*, previously listed as a P1, is no longer listed (Western Australian Herbarium, 1998-). Due to the timing of the survey, it is possible that a number of other Priority flora species may not have been present during the survey despite occurring within the application area (Hart, Simpson and Associates Pty Ltd, 2001). No Threatened flora species were identified as potentially occurring within the application area and none were recorded during the field assessment of the application area (Hart, Simpson and Associates Pty Ltd, 2001; Kingfisher Environmental, 2019a). Although the application area contains *Goodenia lyrata* (P3), *Goodenia hartiana* (P2) and *Fuirena incrassata* (P3), and is likely to contain additional conservation significant flora species, the clearing of a six metre corridor is unlikely to have significant impacts on the local populations of these species.

Field assessments of the application area recorded nine species of weeds; *Aerva javanica*, *Citrullus lanatus* (now *Citrullus amarus*), *Ricinus communis*, *Malvastrum americanum*, *Cenchrus ciliaris*, *Cenchrus setiger*, *Chloris virgata*, *Cynodon dactylon*, *Indigofera oblongifolia* and *Typha orientalis* (now naturalised) (Hart, Simpson and Associates Pty Ltd, 2001; McConnell Dowell, 2005; Western Australian Herbarium, 1998-). Two years post clearing, weeds were recorded in greater proportions within the application than in surrounding undisturbed areas (Coffey, 2007), however the proportion of weeds within the application area is likely to have decreased as the native vegetation regrew and stabilised. Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction and spreading of weeds may be minimised by the implementation of a weed management condition.

Three fauna habitat types were identified as occurring within the application area (APA, 2019). A desktop assessment of the application area identified 389 fauna species with the potential to occur, including 11 frogs, 129 reptiles, 194 birds, 45 native mammal and ten introduced mammal species (Kingfisher Environmental, 2019b). Twenty-nine Threatened and Priority fauna species were identified as potentially present within the application area due to their known distributions (Hart, Simpson and Associates Pty Ltd, 2001; Kingfisher Environmental, 2019b). However, the majority of the species identified were determined to be unlikely to be significantly impacted by the proposed clearing due to being highly mobile in nature, being seasonal or transient visitors, or due to a lack of suitable habitat within the application area. Six species; dampierland plain slider, *Lerista separanda* (P2); greater bilby, *Macrotis lagotis* (VU at both State and Federal level); mulgara, *Dasyercus* species (P4); northern marsupial mole, *Notoryctes caurinus* (P4); northern quoll, *Dasyurus hallucatus* (EN at both State and Federal level) and spectacled hare-wallaby, *Lagorchestes conspicillatus leichardti* (P4), were previously recorded along, or in close proximity to the Telfer Gas Pipeline and an additional two species; Pilbara olive python, *Liasis olivaceus barroni* (VU at both State and Federal level); and western pebble-mound mouse, *Pseudomys chapmani* (P4), are considered to be highly likely to occur within the application area (GIS Database; Kingfisher Environmental, 2019b).

During the construction of the pipeline a large number of fauna were captured within the pipeline trench, the majority were reptiles including geckos, dragons, snakes and skinks, however three conservation significant species were also captured; mulgara; long-tailed dunnart, *Sminthopsis longicaudata* (P4), and northern marsupial mole (McConnell Dowell, 2005). Fauna capture rates were highest in areas where the pipeline existed in close proximity to rocky outcrops and ridges (McConnell Dowell, 2005). The greater bilby was also noted as being present in the area with a number of burrows avoided by a pipeline diversion (McConnell Dowell, 2005). Advice received from DBCA (2019) indicated that pre-clearance, targeted survey(s) for active burrows of conservation significant fauna species should be conducted by suitably qualified personnel (experienced in surveying for these species) in areas identified as suitable habitat for these species. Clearing should be performed as a staged approach to accommodate pre-clearance surveys (DBCA, 2019). Potential impacts to conservation significant fauna species as a result of clearing may be minimised by the implementation of a fauna management condition requiring pre-clearance surveys.

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

Methodology

APA (2019)
DBCA (2019)
CALM (2002)
Coffey (2007)
Hart, Simpson and Associates Pty Ltd (2001)
Kingfisher Environmental (2019a)
Kingfisher Environmental (2019b)
McConnell Dowell (2005)
Western Australian Herbarium (1998-)

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

The following five broad fauna habitats have been recorded within the application area (Hart, Simpson and Associates Pty Ltd, 2001; Kingfisher Environmental, 2019b):

- Sandplains of the Pilbara and the edge of the desert, with shrubs over *Triodia* hummock grasslands;
- Drainage lines including large rivers and associated alluvial soils, intersecting the sandplains;
- Granite outcrops, which are scattered throughout;
- Pindan sandplain in the north, which is very similar to the adjacent desert and continuous with it in both soil and vegetation;
- Stony hills and valleys, mainly in the Shay Gap area, and otherwise relatively small and isolated; and
- Extensive swale and sand dune systems of the Great Sandy Desert in the east, broken only by small areas of other habitats.

The majority of habitats are widespread and common, with the rivers and granite exposures being less common, however all habitats are represented outside the application area (GIS Database; Hart, Simpson and Associates Pty Ltd, 2001). In the 15 years since initial clearing for pipeline construction, extensive rehabilitation has occurred and the pipeline corridor supports native vegetation, such as extensive *Triodia* hummock grasslands and *Acacia* shrublands, suitable to support a diverse fauna assemblage (Kingfisher Environmental, 2019b).

The greater bilby and mulgara are considered highly likely to forage and potentially burrow within the Telfer Gas Pipeline corridor due to the presence of suitable habitat (GIS Database; Hart, Simpson and Associates Pty Ltd, 2001; Kingfisher Environmental, 2019b). Suitable habitat for the northern marsupial mole is present, however as the northern marsupial mole rarely comes above ground, it is unlikely to be significantly impacted by clearing if the root zones and soil is not disturbed. Suitable habitat for the great desert skink and dampierland plain slider is also present, and there is the potential for these species to be present within the application area (GIS Database; Kingfisher Environmental, 2019b). Although likely to be present within the application area, it is unlikely that the northern quoll, long-tailed dunnart, Pilbara olive python, spectacled hare-wallaby and western pebble-mound mouse will be significantly impacted by the proposed clearing due to limited mature vegetation and rocky areas that comprise their preferred sheltering and denning habitat.

Although the application area may possibly contain conservation significant fauna, the majority of species potentially present are considered to be mobile and transient, and the six metre corridor is unlikely to represent critical feeding or breeding habitat for any of these species. However, as habitat within the corridor may contain burrows for conservation significant fauna such as greater bilby, mulgara, dampierland plain slider and great desert skink, potential impacts as a result of clearing may be minimised by the implementation of a fauna management condition requiring pre-clearance surveys.

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

Methodology DBCA (2019)
Hart, Simpson and Associates Pty Ltd (2001)
Kingfisher Environmental (2019b)

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). Flora surveys of the application area did not record any species of Threatened flora (APA, 2019; Coffey, 2007; Hart, Simpson and Associates Pty Ltd, 2001).

The vegetation associations within the application area are common and widespread within the region (APA, 2019; Coffey, 2019; Hart, Simpson and Associates Pty Ltd, 2001; 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 APA (2019)
Coffey (2007)
Hart, Simpson and Associates Pty Ltd (2001)

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 (APA, 2019).

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

Methodology APA (2019)

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 Great Sandy Desert, Little Sandy Desert and Pilbara Bioregions of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99% of the pre-European vegetation still exists in the IBRA Great Sandy Desert, Little Sandy Desert and Pilbara Bioregions (Government of Western Australia, 2018). The application area is broadly mapped as Beard vegetation associations:

41: Shrublands; teatree scrub;

93: Hummock grasslands, shrub steppe; kanji over soft spinifex;

101: Hummock grasslands, shrub steppe; *Acacia pachycarpa* over soft spinifex;

117: Hummock grasslands, grass steppe; soft spinifex;

134: Mosaic: Hummock grasslands, open low tree steppe; desert bloodwood and feathertop spinifex on sandhills / Hummock grasslands, shrub steppe; mixed shrubs over spinifex between sandhills;

157: Hummock grasslands, grass steppe; hard spinifex, *Triodia wiseana*;

171: Hummock grasslands, low tree steppe; snappy gum over soft spinifex and *Triodia brizoides*;

173: Hummock grasslands, shrub steppe; kanji over soft spinifex and *Triodia wiseana* on basalt;

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

619: Medium woodland; river gum (*Eucalyptus camaldulensis*); and

647: Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* over soft spinifex (GIS Database).

Approximately 93-100% 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 – Great Sandy Desert	29,538,799	29,535,810	~99	Least Concern	3
IBRA Bioregion – Little Sandy Desert	11,090,276	11,088,324	~99	Least Concern	4
IBRA Bioregion – Pilbara	17,808,657	17,731,764	~99	Least Concern	10
Beard vegetation associations – WA					
41	194,250	182,311	~93	Least Concern	32
93	3,044,309	3,040,640	~99	Least Concern	1
101	1,191,083	1,191,038	~100	Least Concern	1
117	919,517	886,005	~96	Least Concern	15
134	26,026,864	26,022,995	~99	Least Concern	3
157	502,728	499,311	~99	Least Concern	18
171	331,951	330,643	~99	Least Concern	10
173	1,753,104	1,748,260	~99	Least Concern	13
589	807,698	802,713	~99	Least Concern	1
619	119,373	118,205	~99	Least Concern	0
647	195,860	191,711	~97	Least Concern	32
Beard vegetation associations – Great Sandy Desert Bioregion					
41	144,599	144,599	~100	Least Concern	36
101	961,169	961,124	~100	Least Concern	2
117	467,578	467,121	~99	Least Concern	0
134	13,595,888	13,593,950	~99	Least Concern	4
Beard vegetation associations – Little Sandy Desert Bioregion					
157	82,943	81,060	~97	Least Concern	2
Beard vegetation associations – Pilbara Bioregion					
93	3,042,114	3,038,471	~99	Least Concern	1
117	82,705	78,096	~94	Least Concern	21
157	199,832	198,409	~99	Least Concern	5
171	331,307	330,026	~99	Least Concern	10
173	1,752,520	1,747,677	~99	Least Concern	13
589	728,768	724,695	~99	Least Concern	2
619	118,920	118,116	~99	Least Concern	0
647	195,859	191,710	~97	Least Concern	n/a

* 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

The application area crosses the De Grey River Environmentally Sensitive Area (GIS Database), currently listed in the Directory of Important Wetlands. The De Grey River is a major river system in the Pilbara Bioregion and approximately 160 kilometres long and covers an area of approximately 13,600 hectares (Environment Australia, 2001). The application area is also dissected by numerous major and minor seasonal creek lines (GIS Database). The majority of the creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall.

Based on the above, the proposed clearing is at variance to this Principle. Potential impacts to vegetation growing in association with the watercourse may be minimised by the implementation of a watercourse management condition.

Methodology Environment Australia (2001)

GIS Database:
- Environmentally Sensitive Areas
- 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 stretches 443 kilometres and intersects 15 land systems, with the most common being the Nita, Little Sandy 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).

Land system	Description	Susceptibility to erosion
Boolaloo	Granite hills, domes and tor fields and sandy plains with shrubby spinifex grasslands.	Hills and tor heaps are poorly accessible to livestock, elsewhere on the system the spinifex vegetation is not usually prone to grazing induced degradation but is subject to fairly frequent burning.
Boolgeeda	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands.	Vegetation is generally not prone to degradation and the system is not susceptible to erosion.
Callawa	Highly dissected low hills, mesas and gravelly plains of sandstone and conglomerate supporting soft and hard spinifex grasslands.	The system is not prone to degradation or erosion and is subject to fairly regular burning.
Capricorn	Hills and ridges of sandstone and dolomite supporting shrubby hard and soft spinifex grasslands.	Not susceptible to erosion.
Horseflat	Gilgaied clay plains supporting tussock grasslands and minor grassy snakewood shrublands.	Parts of some units of the system (non-gilgaied plains, alluvial plains and dissected slopes) are moderately to highly susceptible to erosion if vegetation is depleted, other flat units with clay soils and stony mantles are inherently resistant.
Little Sandy	Sandplains and swales; minor gravelly plains with thin sand cover over calcrete and isolated low hills	Sandplain and swales show some susceptibility to erosion after any disturbance which removes the vegetation.

Lochinvar	Stony plains and occasional sand dunes supporting hard spinifex (and occasionally soft spinifex) grasslands.	Sandy surfaced plains show some susceptibility to wind erosion immediately after burning but rapid stabilisation occurs after rain.
Macroy	Stony plains and occasional tor fields based on granite supporting hard and soft spinifex grasslands.	The system has low or very low erosion hazard.
Mallina	Sandy surfaced alluvial plains supporting soft spinifex (and occasionally hard spinifex) grasslands.	Alluvial plains are moderately to highly susceptible to erosion if vegetative cover is seriously depleted.
Nita	Sandplains supporting shrubby soft spinifex grasslands with occasional trees.	Wind erosion may occur after fire, however stabilisation is usually rapid following rain and consequent regeneration of vegetation.
Oakover	Breakaways, mesas, plateaux and stony plains of calcrete supporting hard spinifex grasslands.	The system is not generally prone to degradation or susceptible to soil erosion.
Paradise	Alluvial plains supporting soft spinifex grasslands and tussock grasslands.	Loamy plains and alluvial plains are highly susceptible to water and wind erosion if the vegetative cover is depleted.
River	Active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands.	The system is largely stabilised by buffel grass and spinifex and accelerated erosion is uncommon. However, susceptibility to erosion is high or very high if vegetative cover is removed.
Robertson	Hills and ranges of sedimentary rocks supporting hard spinifex grasslands.	The system is not generally prone to vegetation decline or erosion.
Uaroo	Broad sandy plains supporting shrubby hard and soft spinifex grasslands.	Occasionally some erosion and pasture decline is evident on drainage tracts, but generally the system is not susceptible to erosion or significant vegetation degradation.

The proposed clearing of up to 265.449 hectares of native vegetation, along a narrow six metre wide pipeline easement, is unlikely to cause appreciable land degradation due to the majority of clearing being raised blade and rootstocks primarily being maintained (APA, 2019).

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

Methodology APA (2019)
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 Eighty Mile Beach Marine Park which is located approximately 25 kilometres north of the application area and the Karlamilyi National Park which is located approximately 60 kilometres south-east of 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**
There is one Public Drinking Water Source Area, the De Grey River Water Reserve (Priority 1), within the application area (GIS Database). The proposed clearing for gas pipeline maintenance activities are compatible with conditions in a Priority 1 Public Drinking Water Source Area and it is unlikely that the proposed clearing will cause deterioration to the water quality if all activities are conducted in accordance with DWER Water Quality Protection Guidelines and Notes (DWER, 2019).

There is one permanent watercourse, the De Grey River, and a number of major and minor non-perennial creek lines, within the area proposed to clear (GIS Database). The majority of the creek lines in the region are

dry for most of the year, only flowing briefly immediately following significant rainfall. Although the application area intersects a number of major creek lines, the majority of the proposed clearing will be raised blade clearing, leaving the soil structure and rootstocks intact (APA, 2019). The proposed clearing is unlikely to result in significant changes to surface water flows and is unlikely to cause deterioration in the quality of underground water.

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

Methodology APA (2019)
DWER (2019)

GIS Database:
- 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 regions range from semi-desert-tropical, to arid tropical, and arid, with summer rainfall (CALM, 2002). The nearest weather station to the eastern end of the application area is Telfer Aero, approximately 2 kilometres east of the application area, with an average rainfall of approximately 370.9 millimetres per year (BoM, 2019). The nearest weather station to the western end of the application area is Port Hedland Airport, approximately 7 kilometres north of the application area, with an average rainfall of approximately 317.7 millimetres per year (BoM, 2019).

The application area crosses the De Grey River, a major river system in the Pilbara Bioregion, and is also dissected by numerous seasonal creek lines (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. Although the application area intersects a number of major and minor creek lines, the majority of the proposed clearing will be raised blade clearing, leaving the soil structure and rootstocks intact (APA, 2019). 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 APA (2019)
BoM (2019)
CALM (2002)

GIS Database:
- Hydrography, linear

Planning Instrument, Native Title, previous EPA decision or other matter.

Comments

The clearing permit application was advertised on 6 May 2019 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 six native title claims (determined: WC1996/078, WC1999/003, WC1999/026, WC2005/002 and WC2009/003; registered: WC1999/008) over the area under application (DPLH, 2019). One of these claims has been registered with the National Native Title Tribunal and five have been determined by the Federal Court on behalf of the claimant groups. However, the 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 three 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)

4. References

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- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) An inventory and condition survey of the Pilbara Region, Western Australia. Technical Bulletin No. 92. Department of Agriculture, South Perth, Western Australia.
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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:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T Threatened species:

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

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 in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX Extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes 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 fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species:

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species 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.