



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	10345/1
Permit type:	Purpose permit
Applicant name:	Pilgangoora Operations Pty Ltd
Application received:	1 September 2023
Application area:	345 hectares
Purpose of clearing:	Mineral production and associated activities
Method of clearing:	Mechanical removal
Tenure:	Mining Lease 45/1260 Miscellaneous Licence 45/485
Location (LGA area/s):	Shire of East Pilbara
Colloquial name:	Pilgangoora Lithium Project

1.2. Description of clearing activities

Pilgangoora Operations Pty Ltd proposes to clear up to 345 hectares of native vegetation within a boundary of approximately 361.54 hectares, for the purpose of mineral production and mining related infrastructures. The project is located approximately 90 kilometres south of Port Hedland.

The application is to allow for the development of a tailings storage facility (TSF) to support the Pilgangoora Lithium-Tantalum mine and associated activities.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	4 January 2024
Decision area:	345 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) (now Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)) on 1 September 2023. DEMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix A) relevant datasets (Appendix D), supporting information provided by the applicant including the results of biological surveys, the clearing principles set out in Schedule 5 of the EP Act (Appendix B), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of impacts to conservation significant flora;
- the loss of habitat for western pebble-mound mouse; and
- loss of riparian vegetation.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to have adverse impacts on environmental values and the impacts of clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds; and
- watercourse management condition to reduce the impacts to riparian vegetation.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)

Relevant agreements (treatys) considered during the assessment include:

- Japan-Australia Migratory Bird Agreement
- China-Australia Migratory Bird Agreement
- Republic of Korea-Australia Migratory Bird Agreement

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2014)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant has provided the following avoidance and mitigation measures to support this clearing permit application (MP, 2023a):

- The design of TSF 3 has been developed to have a life of mine of 25 years and be able to contain up to 100 Mt of tailings. This will avoid the requirement for development of another tailings storage facility in the medium to long term. The design of the TSF 3 involves 13 lifts (raises of the tailings wall) thereby optimising available space by developing vertically.
- The sub-soils from the proposed clearing envelope provide a suitable resource for use during construction of TSF 3 embankments and raises. This reduces the requirement to clear other areas to win construction materials.

Additionally, the clearing activities will follow standard protocols to ensure that the clearing is maintained within the proposed boundaries and is compliant with permit conditions (PM, 2023a).

Groundwater Resources Management (GRM) (2018) also recommended specific surface water management actions for this project:

- Minimise the potential project impacts such as changes in the stream-flow regime, alteration of habitat, pollution or increased erosion and sedimentation;
- Where feasible, maintain the shape and composition (geomorphology) of the natural watercourse geometry, natural biological indicator conditions and flow conditions;
- Employ protection measures to prevent adverse hydrological and water quality
- Impacts for all recognised watercourses within the site limits;
- Promote sound development that respects the natural environment; and
- Rehabilitate any watercourses that are impacted as soon as practicable.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (fauna, flora and vegetation). The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora) - Clearing Principles (a)

From the flora and vegetation surveys undertaken within the application area and its surroundings, only two Priority flora species were recorded within the application area (Ecologia, 2018):

- *Euphorbia clementii* (P3) and
- *Triodia chichesterensis* (P3).

Euphorbia clementii was recorded at 27 locations within the application area, totalling approximately 250 individuals (Ecologia, 2018). The species was recorded almost exclusively on vehicle tracks and windrows during the 2018 survey, indicating that the species reacts favourably to disturbance (Ecologia, 2018; PM, 2023b). APM (2022) did not re-record this species, which suggests that the plants recorded are no longer present within the application area and have somewhat short lifespans.

Ecologia (2018) recorded a population of *Triodia chichesterensis* with more than 1,000 individuals, represented by its own vegetation type: *Acacia inaequilatera* sparse mid shrubland over *Triodia chichesterensis* (P3) open hummock grassland.

Triodia chichesterensis is closely related to *Triodia lanigera* and can be difficult to distinguish between the two where they co-occur (PM, 2023b). APM (2022) did not record *Triodia chichesterensis* within the application area despite surveying the same area where Ecologia (2018) recorded the *Triodia chichesterensis* population, likely due to the similarities in morphology. APM (2022) did however record *Triodia lanigera* around the same area where the population of *Triodia chichesterensis* was recorded by Ecologia (2018). It is likely that the *Triodia chichesterensis* population has persisted in the area, however the total number of individuals has likely to have declined due to disturbance for access roads and tracks (PM, 2023b).

The proposed clearing will likely impact *Euphorbia clementii* and *Triodia chichesterensis* if they are still present within the application area. Both species are restricted to the Pilbara bioregion, however they both are well represented locally outside the application area and their habitat requirements are common and widespread within the region (WAH, 1998-; GIS Database).

Conclusion

Based on the above assessment, the proposed clearing will result in a direct loss of priority flora species.

For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed to be environmentally acceptable with standard avoid and minimise and weed management conditions.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- avoid, minimise to reduce the impacts and extent of clearing; and
- take hygiene steps to minimise the risk of the introduction and spread of weeds.

3.2.2. Biological values (fauna) - Clearing Principles (b)

Two fauna habitats were identified within the application area: Stony plains (comprising 94.5% of the application area) and Minor Drainage Lines (5.5%) (Ecologia, 2018).

Stony plains surveyed in the application area did not support substrates that facilitate the construction of burrows, which consequently do not provide suitable habitat for greater bilby or brush-tailed mulgara (Ecologia, 2018). Due to the lack of suitable habitat and evidence of greater bilby or brush-tailed mulgara during the field survey (Ecologia, 2018), these species are unlikely to occur within the application area.

Western pebble-mound mouse (*Pseudomys chapmani*, P4) mounds (active and inactive) were recorded within the application area during numerous field surveys (Ecologia, 2018; APM, 2022). It is likely that the proposed increase in clearing will directly impact these mounds, however the stony plain habitat is not restricted to the application or local area. The localised loss of habitat and the impacts to the five mounds caused by the proposed clearing is unlikely to significantly impact on the conservation status of western pebble-mound mouse.

The minor drainage lines may provide foraging habitats for numerous conservation significant fauna species, including the Pilbara leaf-nosed bat (*Rhinonicteris aurantia*, VU), ghost bat (*Macroderma gigas*, VU) and northern quoll (*Dasyurus hallucatus*, EN) (Ecologia, 2018). However, no suitable caves or roosting sites for the Pilbara leaf-nosed bat or ghost bat, nor denning habitat or secondary evidence for the northern quoll were identified within the application area (Ecologia, 2018).

Due to the ongoing disturbance caused by grazing, foraging resources are of low quality and may be used by species to transit to more productive surrounding areas found outside the application area (APM, 2022). The application area is immediately adjacent to the existing mining operations and infrastructure, and the proposed clearing of this area is unlikely to cause a significant reduction in habitat connectivity for fauna species within the area. Given the available fauna habitats within the application area are common within the broader region it is unlikely the application area provides significant habitat for conservation significant fauna.

Conclusion

Based on the above assessment, the proposed clearing will result in a direct loss of habitat for western pebble-mound mouse.

For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed to be environmentally acceptable with standard avoid and minimise and weed management conditions.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- No fauna management is recommended

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 27 October 2023 by the Department of Energy, Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim over the area under application (DPLH, 2023). This claim has been determined by the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance within the application area (DPLH, 2023). 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.

Other relevant authorisations required for the proposed land use include:

- A Mining Proposal / Mine Closure Plan approved under the *Mining Act 1978*.

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.

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia (GIS Database). It is surrounded by large areas of uncleared land and mining operations (GIS Database).
Ecological linkage & Conservation areas	According to available databases, the application area is not considered an ecological linkage, nor is it located in close proximity to conservation areas (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation association (GIS Database): 93: Hummock grasslands, shrub steppe - kanji over soft spinifex.</p> <p>A flora and vegetation survey was conducted over part of the application area by Ecologia Environment (Ecologia) during May 2018. The following vegetation types were recorded within the application area (Ecologia, 2018):</p> <p>S1: <i>Acacia inaequilatera</i> and <i>Acacia ancistrocarpa</i> mid open shrubland over <i>Triodia longiceps</i> ($\pm T. lanigera$, <i>T. brizoides</i>, <i>T. epactia</i>) open hummock grassland;</p> <p>S2: <i>Neptunia dimorphantha</i> and <i>Sida fibulifera</i> low open shrubland over <i>Eriachne benthamii</i> and <i>Cynodon convergens</i> open grassland – S1 and S2 comprise 83.9% of the application area;</p> <p>S3: <i>Acacia acradenia</i>, <i>A. ancistrocarpa</i>, <i>A. tumida</i> var. <i>pilbarensis</i>, and <i>Petalostylis labicheoides</i> mid open shrubland over <i>Triodia epactia</i> ($\pm T. wiseana$) hummock grassland;</p> <p>S4: <i>Acacia inaequilatera</i> sparse mid shrubland over <i>Triodia chichesterensis</i> (P3) open hummock grassland;</p> <p>W1: <i>Eucalyptus victrix</i> and <i>Corymbia hamersleyana</i> low open woodland over <i>Acacia colei</i> mid sparse shrubland over <i>Triodia epactia</i> sparse hummock grassland;</p> <p>W2: <i>Corymbia hamersleyana</i> low open woodland over <i>Acacia acradenia</i> and <i>A. ancistrocarpa</i> mid sparse shrubland over <i>Triodia epactia</i> ($\pm T. wiseana$, <i>T. longiceps</i>) open hummock grassland.</p> <p>Another flora and vegetation survey was conducted over part of the application area by Animal Plant Mineral Pty Ltd (APM) during October 2022. The following vegetation types were recorded within the application area (APM, 2022):</p> <p>12a: Undulating plains of isolated low <i>Corymbia hamersleyana</i> over mid to tall, isolated shrubs of <i>Acacia tumida</i>, <i>Acacia adsurgens</i> and <i>Acacia inaequilatera</i> with hummock grassland of <i>Triodia angusta</i>, <i>Triodia wiseana</i> and <i>Triodia lanigera</i>;</p> <p>13a: Low open woodland of <i>Eucalyptus camaldulensis</i>, <i>Corymbia hamersleyana</i> and <i>Eucalyptus victrix</i>; sparse mid to tall shrubland of <i>Acacia tumida</i>, <i>Acacia stellaticeps</i> and <i>Acacia bivenosa</i> over <i>Triodia epactia</i>, *<i>Cenchrus ciliaris</i> and *<i>Cenchrus setiger</i> tussock/hummock grassland in creeks; and</p> <p>14a: <i>Corymbia hamersleyana</i> low open woodland over sparse forbland/low shrubland of <i>Streptoglossa odora</i>, <i>Goodenia lamprosperma</i> and <i>Solanum diversiflorum</i> in drainage depressions.</p>
Vegetation condition	<p>Vegetation surveys (Ecologia, 2018; APM, 2022) indicate the vegetation within the proposed clearing area is in Excellent to Completely Degraded condition (Trudgen, 1991), described as:</p> <ul style="list-style-type: none"> Excellent: Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. <p>To</p> <ul style="list-style-type: none"> Completely Degraded: Areas that are completely or almost completely without native species in the structure of their vegetation, i.e., areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs. <p>The full Trudgen (1991) condition rating scale is provided in Appendix C.</p>

Characteristic	Details
Climate and landform	The application area is mapped within elevations of 170 to 180 meters AHD (GIS Database). The climate of the region is described as semi-desert-tropical, and the annual rainfall average of approximately 382.1 millimetres (BoM, 2023).
Soil description & Land degradation risk	The soil is mapped as part of the Satirist (283St) soil systems (DPIRD, 2023), described as: Stony plains and low rises supporting hard spinifex grasslands, and gilgai plains supporting tussock grasslands. This system has low risk of water or wind erosion (Van Vreeswyk et al. 2004).
Waterbodies & Hydrogeography	There are two minor ephemeral drainage lines that intersect the application area (GIS Database). The application area is not located within a Public Drinking Water Source Area (GIS Database). The mapped groundwater salinity is between 500 - 1,000 milligrams per litre total dissolved solids, which is described as marginal water quality (GIS Database).
Flora	There are records of one threatened flora species and 10 priority flora species within a 20 kilometre radius of the application area (GIS Database).
Ecological communities	There are no known threatened or priority ecological communities mapped within the application area (GIS Database). The nearest known ecological community is the Gregory Land System priority ecological community (P3), located approximately 29 kilometres west of the application area (GIS Database).
Fauna	There are 13 known records of conservation significant species within 20 kilometres of the application area, of which five of them are birds (GIS Database).

A.2. Flora analysis table

Likelihood of occurrence of conservation significant flora species within the application area (Ecologia, 2018).

Status	Taxon	Source	Habitat	Flowering period	Notes	Likelihood of occurrence (including current survey)
T	<i>Pityrodia</i> sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	TPFL	Base of sandstone hill slopes with skeletal brown sandy loam over sandstone.	July to September	Habitat not present.	Unlikely (3)
1	<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	TPFL	Coastal or near-coastal sand dunes, margins of estuaries, coastal plains. Red sand or clay.	Not available	Habitat not present.	Unlikely (3)
1	<i>Acacia leeuweniana</i>	TPFL	Skeletal granitic soil over massive granite.	Not available	Habitat not present.	Unlikely (3)
1	<i>Heliotropium muticum</i>	TPFL, MMWA (2016)	Plains. Flat red silt sand on a low-lying floodplain.	Not available	Habitat possibly present; nearby records.	Possible (1)
1	<i>Rothia indica</i> subsp. <i>australis</i>	TPFL	Sandy soils. Sandhills and sandy flats. Near-coastal sands.	April to August	Habitat not present.	Unlikely (3)
2	<i>Euphorbia clementii</i>	TPFL	Gravelly hillsides, stony grounds.	April to June	Habitat possibly present; nearby records.	Recorded
2	<i>Stylidium weeliwoilli</i>	TPFL	Gritty sand soil, sandy clay. Edge of watercourses.	August to September	Habitat not present.	Unlikely (3)
3	<i>Acacia levata</i>	TPFL	Sand or sandy loam over granite. Low rocky hills.	May	Habitat possibly present; nearby records.	Possible (1)
3	<i>Eragrostis crateriformis</i>	TPFL	Clayey loam or clay. Flats, creek banks, depressions.	January to July	Habitat possibly present; nearby records.	Possible (1)
3	<i>Fimbristylis sieberiana</i>	TPFL	Riparian habitats, edges of pools.	May to June	Habitat not present.	Unlikely (3)
3	<i>Gomphrena leptophylla</i>	TPFL	Sand, sandy to clayey loam, granite, quartzite. Open flats, sandy creek beds, edges salt pans & marshes, stony hillsides.	March to September	Habitat possibly present; nearby records.	Possible (1)
3	<i>Gymnanthera cunninghamii</i>	TPFL	Permanent or semi-permanent water-courses in sandy soils.	January to December	Habitat not present.	Unlikely (3)
3	<i>Nicotiana umbratica</i>	TPFL	Shallow soils. Rocky outcrops.	April to June	Habitat not present.	Unlikely (3)
3	<i>Phyllanthus hebecarpus</i>	TPFL	Sandy areas, granite domes.	April to August	Habitat not present.	Unlikely (3)
3	<i>Stackhousia clementii</i>	Natural Area (2016)	Skeletal soils. Sandstone hills.	Not available	Habitat possibly present; nearby records.	Possible (1)
3	<i>Terminalia supranitfolia</i>	TPFL	Sand. Among basalt rocks. Rocky cliffs.	July or December	Habitat not present.	Unlikely (3)
3	<i>Triodia basitricha</i>	TPFL	Rocky and gravelly slopes of mountains or low hills.	Not available	Habitat not present.	Unlikely (3)
3	<i>Triodia chichesterensis</i>	TPFL	Sand or loam over rocky or gravelly substrates, often with quartzite.	Not available	Habitat possibly present; nearby records.	Recorded
4	<i>Bulbostylis burbridgeae</i>	TPFL	Granitic soils. Granite outcrops, cliff bases.	March to August	Habitat not present.	Unlikely (3)
4	<i>Goodenia nuda</i>	TPFL	Seasonally inundated clay soils and drainage lines	April to August	Habitat possibly present; nearby records.	Possible (1)
4	<i>Ptilotus mollis</i>	TPFL	Steep rocky slopes, massive ironstone formations.	May to September	Habitat not present.	Unlikely (3)

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains two priority flora species, however the impact from the proposed clearing is unlikely to significantly impact the conservation status of these species.</p> <p>No Threatened or Priority Ecological Communities were identified within the application area (Ecologia, 2018; APM, 2022; GIS Database).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain locally or regionally significant habitat necessary for the maintenance of conservation significant fauna species.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>There are no known records of Threatened flora within the application area (GIS Database). A flora and vegetation survey of the application area did not record any species of Threatened flora (Ecologia, 2028; APM, 2022).</p> <p>There is a record of a Threatened flora species, <i>Quoya zonalis</i>, located approximately 15 kilometres from the application area (GIS Database). The application area is unlikely to contain suitable habitat for <i>Quoya zonalis</i> as it is usually found on steep, rocky, sandstone conglomerate and granite slopes in skeletal, brown, sandy loam soils (Shepherd & Hislop, 2020; GIS Database).</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>There are no known or mapped Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The application area occurs within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, in which approximately 99% of the pre-European vegetation remains (Government of Western Australia, 2019; GIS Database).</p> <p>The vegetation within the application area has been mapped as Beard vegetation association 93: Hummock grasslands, shrub steppe; kanji over soft spinifex (GIS Database).</p> <p>Approximately 99% of the pre-European extent of this vegetation association remain uncleared at both the state and bioregional level (Government of Western Australia, 2019).</p> <p>Given the amount of vegetation remaining in the local area and bioregion, the vegetation proposed to be cleared is not considered to represent a remnant within an extensively cleared area.</p>	Not likely to be at variance	No
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area is approximately 78 kilometres southwest of the application area, the proposed clearing is not likely to have an impact on the environmental values of this conservation area (GIS Database).</p>	Not likely to be at variance	No
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>Principle (f): <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>There are two ephemeral drainage lines intersecting the application area (GIS Database). Drainage lines are common in local area and impacts to vegetation growing in association with a watercourse can be managed by a vegetation management condition to avoid clearing of riparian vegetation where possible and maintaining water flows.</p>	May be at variance	No
<p>Principle (g): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils within the application (Appendix A.1) are generally not susceptible to wind or water erosion (DPIRD, 2023; Van Vreeswyk et al. 2004).</p>	Not likely to be at variance	No
<p>Principle (i): <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.”</i></p> <p><u>Assessment:</u></p> <p>Given no permanent water courses, wetlands, or Public Drinking Water Source Areas are recorded within the application area (GIS Database), the proposed clearing is unlikely to significantly impact surface or ground water quality.</p> <p>The proponent engaged Groundwater Resources Management (GRM) (2018) to undertake a feasibility study of the surface water management within the application area, which recommended implementing several water management measures (section 3.1.) to avoid potential impacts to the surface water flow.</p> <p>Additionally, the vegetation management condition recommended in Principle (f) would also capture surface water mitigation measures by reinstating surface water flow.</p>	May be at variance	No
<p>Principle (j): <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>The average rainfall of approximately 281.3 millimetres per year and evaporation rate potentially exceeding 3,000 millimetres per year are unlikely to cause or intensify flooding events within the application area (PM, 2023a).</p> <p>No permanent water courses or waterbodies were recorded within the application area; however, there are two ephemeral drainage lines (GIS Database). Drainage lines in the area are dry for most of the year, only flowing briefly immediately following significant rainfall (GRM, 2018; PM, 2023a).</p> <p>Therefore, the proposed clearing activities are unlikely to cause an incidence of, or intensity increase to flooding.</p>	Not likely to be at variance	No

Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation’s ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.

Condition	Description
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D. Sources of information

D.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- Contours (DPIRD-073)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- Interim Ramsar Sites (DBCA-010)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

D.2. References

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- Environmental Protection Authority (EPA) (2016) Technical Guidance – Terrestrial Fauna Surveys. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf
- Environmental Protection Authority (EPA) (2020) Technical Guidance – Terrestrial Fauna Surveys. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/2020.09.17%20-%20EPA%20Technical%20Guidance%20-%20Vertebrate%20Fauna%20Surveys%20-%20Final.pdf
- Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Groundwater Resource Management (2018) Report on Pilgangoora Lithium-Tantalum Project 5 MTPA Definitive Feasibility Study Surface Water Management. Prepared for Pilbara Minerals Limited
- Pilbara Minerals Limited (PM) (2023a) Pilgangoora Lithium Project Support Information for Native Vegetation Clearing (Purpose) Permit Application M45/1260 and L45/485, Shire of East Pilbara. Prepared for Pilgangoora Operations Pty Ltd by Pilbara Minerals Limited. August 2023.
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4. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
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)
DCCEEW	Department of Climate Change, Energy, the Environment and Water, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia (now DEMIRS)
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DCCEEW)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, 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.

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened 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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.