GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 10559/1
Permit Holder:	Leichhardt Port Pty Ltd
Duration of Permit:	From 25 December 2024 to 25 December 2034

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of vehicular access, geotechnical investigations, and installation of groundwater monitoring wells.

2. Land on which clearing is to be done

Lot 567 on Deposited Plan 401284 (Crown Reserve 52734), Mardie

3. Clearing authorised

The permit holder must not clear more than 3.5 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

4. Period during which clearing is authorised

The permit holder must not clear any *native vegetation* after 25 December 2029.

PART II – MANAGEMENT CONDITIONS

5. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the clearing of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of clearing on any environmental value.

6. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

7. Directional clearing

The permit holder must:

(a) conduct clearing activities in a slow, progressive manner towards adjacent *native vegetation*; and

(b) allow reasonable time for fauna present within the area being cleared to move into adjacent *native vegetation* ahead of the clearing activity.

8. Vegetation management - watercourses

The permit holder must not clear *riparian vegetation* within 30 metres of any *watercourse* that intersects the area cross-hatched yellow on Figure 1 of Schedule 1.

9. Fauna management – backfilling

The permit holder must:

(a) fence all test pits on the day of drilling/excavating with fine mesh to prevent fauna access; or

(b) cover all test pits on the day of drilling/excavating with a cover which prevents entry to the pits by fauna species and backfill upon completion; and

(c) cover all bore holes at the end of each day and backfill upon completion.

(d) the permit holder must restrict clearing activities to day-light hours to avoid the possibility of injury to fauna.

10. Fauna management – fauna spotter

(a) The permit holder must engage a fauna spotter to traverse the area cross-hatched yellow on Figure 1 of Schedule 1 ahead of clearing machinery immediately prior to, and for the duration of, clearing activities;

(b) Clearing activities must cease in any area where native fauna are identified under condition 10(a) until native fauna individual(s) have moved on from that area to adjoining vegetation.

(c) Where *conservation significant fauna* individual(s) are identified under condition 10(a) of this permit, the permit holder must include the following in a report submitted to the *CEO* within three (3) months of undertaking any clearing authorised under this permit:

(i) the species of each *conservation significant fauna* individual(s) identified;

(ii) the number of individuals identified;

(iii) the date each individual was identified;

(iv) the location where each individual was identified recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;

(v) the relevant qualifications of the fauna spotter undertaking identification, under condition 10(b); and

(vi) details pertaining to the circumstances of any death of, or injury sustained by, a *conservation significant fauna* individual.

11. Revegetation and rehabilitation (temporary works)

The permit holder must:

(a) retain the vegetative material and topsoil removed by clearing authorised under this permit and stockpile the vegetative material and topsoil in an area that has already been cleared;

(b) at an *optimal time* within six (6) months following clearing authorised under this permit, *revegetate* and *rehabilitate* the area(s) that are no longer required for the purpose for which they were cleared under this permit (*temporary works*) by:

(i) ripping the ground on the contour to remove soil compaction; and

(ii) laying the vegetative material and topsoil retained under condition 11(a) on the cleared area(s).

(c) within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 11(b)(ii) of this permit:

(i) engage an environmental specialist to determine the species composition, structure and density of the area revegetated and rehabilitated; and

(ii) where, in the opinion of an environmental specialist, the composition structure and density determined under condition 11(c)(i) of this Permit will not result in similar species composition, structure and density to that of pre-clearing vegetation types in that area, revegetate the area by deliberately planting and/or direct seeding native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only local provenance seeds and propagating material are used.

PART III - RECORD KEEPING AND REPORTING

12. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; (f) actions taken to minimise the risk of the introduction and spread of *weed* in accordance with condition 6;

No.	Relevant matter	Specifications
		(g) actions taken to undertake directional clearing in accordance with condition 7; and (h) actions taken to avoid *riparian vegetation* in accordance with condition 8.
2.	In relation to fauna management pursuant to condition 9	(a) evidence of backfilling / fencing / covering all excavations in accordance with condition 9.
3.	In relation to fauna management pursuant to condition 10	(a) actions taken to avoid impacts to fauna in accordance with condition 10; and (b) a copy of the fauna spotter's report in accordance with condition 10(c).
4.	In relation to the revegetation and rehabilitation of areas pursuant to condition 11 of the permit	(a) the size of the area *revegetated* and *rehabilitated*; (b) the date(s) on which the *revegetation* and *rehabilitation* was undertaken; and (c) the boundaries of the area *revegetated* and *rehabilitated* (recorded digitally as a shapefile)

13. Reporting

The permit holder must provide to the *CEO* the records required under condition 12 of this permit when requested by the *CEO*.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
conservation significant fauna	means those fauna taxa listed as threatened or specially protected species under the *Biodiversity Conservation Act 2016* (WA) or as priority fauna classes 1, 2, 3, or 4 in the Department of Biodiversity, Conservation and Attractions *Threatened and Priority Fauna List for Western Australia* (as amended from time to time) and/or listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
direct seeing	means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species.
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent and has a minimum of 2 years work experience relevant to the type of environmental advice that an environmental

Term	Definition
	specialist is required to provide under this permit, or who is approved by the *CEO* as a suitable environmental specialist.
EP Act	*Environmental Protection Act 1986* (WA)
fill	means material used to increase the ground level, or to fill a depression.
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same IBRA subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
optimal time	means the period from November to December for undertaking direct seeding and no planting without irrigation for undertaking planting.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species
rehabilitate/ed/ion	means actively managing an area containing native vegetation in order to improve the ecological function of that area.
revegetate/ed/ion	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
riparian vegetation	has the meaning given to it in Regulation 3 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.
temporary works	means access tracks, spoil areas, side tracks, site offices, storage areas, laydown areas, extraction sites, camps, project surveys, pre-construction activities, and similar works associated with a project activity that are temporary in nature
watercourse/s	Has the meaning given under section 3 of the *Rights in Water and Irrigation Act 1914*
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS

JBurton

Jessica Burton
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

28 November 2024

Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

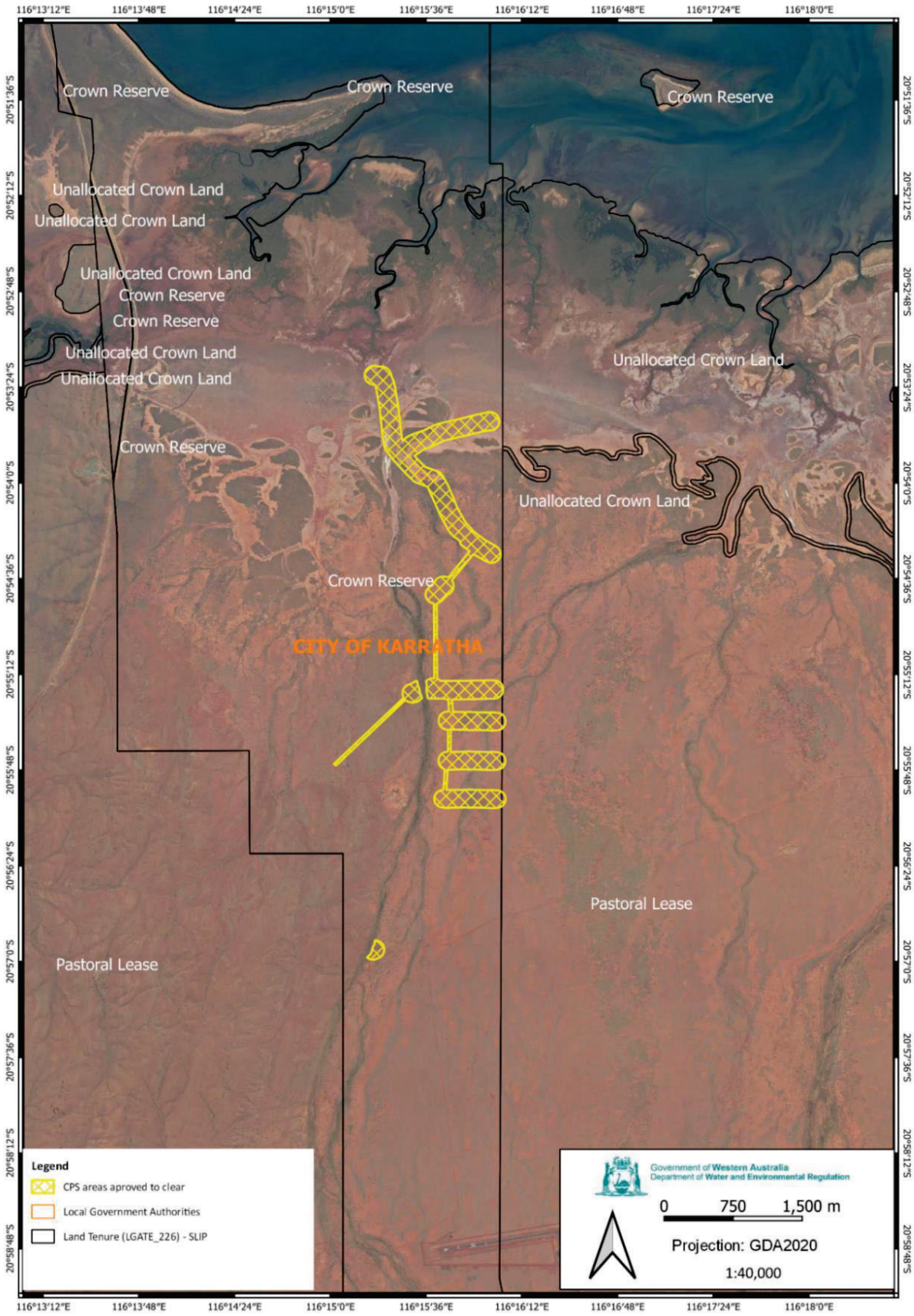

Figure 1: Map of the boundary of the area within which clearing may occur

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10559/1
Permit type:	Purpose permit
Applicant name:	Leichhardt Port Pty Ltd
Application received:	15 March 2024
Application area:	3.5 hectares (ha) of native vegetation within a 161.32 ha of clearing footprint
Purpose of clearing:	Vehicular access, geotechnical investigations and installation of groundwater monitoring wells
Method of clearing:	Mechanical removal
Property:	Lot 567 on Deposited Plan 401284
Location (LGA area/s):	City of Karratha
Localities (suburb/s):	Mardie

1.2. Description of clearing activities

The vegetation proposed to be cleared comprises 3.5 ha of native vegetation within a 161.32 -ha footprint for the purpose of providing vehicular access for backhoe and associated vehicles to excavate geotechnical test pits for and install groundwater monitoring wells (see Figure 1, Section 1.5). Test pits are required to identify soil properties to ensure the design and construction of the foundations for the project are sound. Groundwater monitoring bores are also to be installed to gather crucial baseline information to inform the groundwater modelling for the project. These preliminary works are associated with the Eramurra Solar Salt Project which will be referred to the Environmental Protection Authority (EPA) for assessment (Leichhardt, 2024b).

The scope of the clearing activities is as follows:

- clearing as required (if bare ground is not available) to allow the excavation of approximately 12 test pits across the site to a depth of up to 3 metres (or shallower if restricted by refusal or collapsing);
- clearing as required (if bare ground is not available) to allow the installation of six groundwater monitoring wells; and
- access - damage to vegetation as a result of driving over the vegetation to access the sites.

During the assessment, the clearing footprint was reduced from 164.95 ha to 161.32 ha in response to the Department of Water and Environmental Regulation's (DWER) request for further information to avoid and minimise impacts to potentially significant fauna habitat within the proposed clearing footprint (see Section 3.1 for further details).

1.3. Decision on application

Decision:	Granted
Decision date:	28 November 2024

Decision area:	3.5 ha of native vegetation within a 161.32-ha footprint, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). DWER advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A.1), relevant datasets (see Appendix H.1), the findings of a flora and vegetation survey (Phoenix, 2022a), a terrestrial fauna and migratory shorebird survey (Phoenix, 2023), other information provided by the applicant (refer to section 3.1), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), as well as planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that the proposed clearing works will facilitate the planning phase of the proposed development of the Eramurra Solar Salt Project.

The assessment identified that the proposed clearing has the potential to facilitate the spread of weeds into adjacent vegetation and will result in the loss of vegetation that may provide significant habitat for conservation significant flora and fauna species. However, 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 long-term adverse impacts on biological, conservation or land and water resources values, given the temporary nature of the clearing and the extent of the proposed clearing in the context of available habitat within the greater application area and local area.

The Delegated Officer determined that the impacts of the proposed clearing can be minimised and managed to lead to an unacceptable risk to environmental values through the implementation of permit conditions.

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
- undertake slow, progressive, one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- ensure no clearing of native vegetation occurs within 30 metres of any non-perennial watercourses
- revegetate and rehabilitate areas cleared for temporary works by laying stockpiled vegetative material and topsoil on the cleared areas.
- engage a fauna spotter for the duration of the clearing activities; and
- backfilling, fencing or covering all test pits and bore holes to prevent fauna access.

1.5. Site map

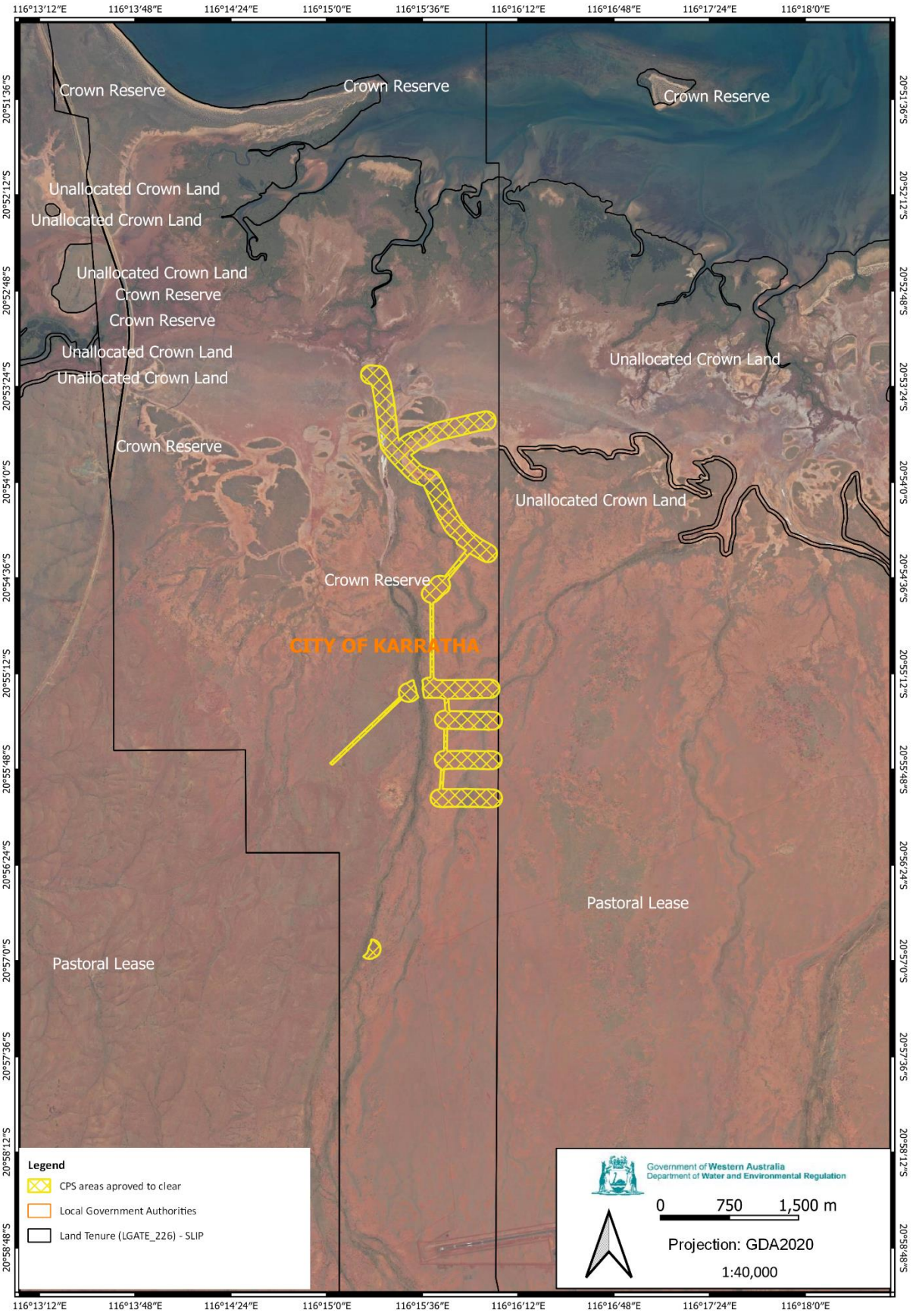

Figure 1 - The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

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)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Rights in Water and Irrigation Act 1914* (WA) (RIWI Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant submitted the following measures to demonstrate evidence of avoidance and mitigation considerations to minimise the impacts to native vegetation in relation to their original proposal to clear 3.5 ha within a 164.95-ha footprint. These measures included:

- Existing tracks and cleared areas have been targeted during the planning phase of the program.
- all clearing to be managed under a clearing contractor's Ground Disturbance Permit (or similar);
- areas of bare ground will be targeted for test pits and groundwater bores, if available;
- access will be by driving over existing vegetation rather than clearing defined access tracks;
- the total extent of vegetation clearing is limited to up to 3.5 ha of disturbance;
- the clearing areas will be identified using GPS coordinates;
- all clearing kept to a minimum within the Permit Area and completed only when required; and
- all vehicles, equipment and personnel will be inspected and cleaned as required to prevent the incidental spread of weeds.

The applicant was asked if further avoidance and mitigation measures could be applied to their proposed clearing to reduce impacts to potentially significant habitat for threatened fauna species. In response, the applicant reduced the clearing footprint from 164.95 ha to 161.32 ha, which resulted in the avoidance of the 'Forest of Eucalyptus spp. over tall shrubland over grass land habitat type', which may provide significant habitat features.

The Delegated Officer also took into consideration that the purpose of the proposed clearing includes clearing for temporary works relating to geotechnical investigations, vehicular access and installation of groundwater monitoring wells, and that all areas cleared for temporary works will be revegetated and rehabilitated after clearing. The Delegated Officer was satisfied that the applicant has undertaken reasonable measures to avoid and minimise potential impacts of the proposed clearing on environmental values. The Delegated Officer further determined that a revegetation condition be imposed on the permit, requiring the applicant to revegetate and rehabilitate all areas cleared for temporary works.

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.1) 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 (see Appendix B) identified that the impacts of the proposed clearing present a risk to biological values (fauna, adjacent flora and vegetation) and land and water resources. 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 – Biodiversity, Flora and Priority Ecological Communities - Clearing Principles (a, c and d)

Assessment

No threatened flora species have been recorded within the local area (50-kilometre radius from the application area). A likelihood assessment for conservation significant flora was conducted based on habitat and soil preferences, vegetation and soil types mapped within the application area and known species distribution. The assessment identified three conservation significant flora species which may occur in the application area (see Appendix A.3.). These are:

- *Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479);* listed as Priority 3 by DBCA
- *Rostellularia adscendens var. latifolia;* listed as Priority 3 by DBCA
- *Eremophila forrestii subsp. Viridis;* listed as Priority 3 by DBCA

The closest conservation significant flora record is the Priority 3 species *Rostellularia adscendens var. latifolia*, recorded approximately 210 metres west from the application area along Eramurra Creek (Phoenix, 2022). The applicant's supporting documents indicate no disturbance to vegetation associated with Eramurra Creek is proposed as part of this application (Leichhardt, 2024b).

Phoenix Environmental Sciences Pty Ltd conducted a detailed flora and vegetation broader survey including the application area in June 2022, which indicates the application area consists of ten vegetation types:

- Mid sparse to open shrubland over hummock grassland (AbTw)
- Tall sparse shrubland over low sparse grassland (AssCc)
- Mid sparse shrubland to open shrubland over low sparse to open tussock grassland (AxEx)
- Open forest over shrubland and grassland (EvAcCf)
- Low isolated forbs over grassland (Ex)
- Mudflat (Mudflat)
- Mudflat/algal mat (Mudflat/algal fat)
- Mid isolated shrubs over hummock grassland (Te)
- Low open shrubland over tussock grassland (Tspp)
- Isolated low shrubs over hummock grassland (Tw)

The flora and vegetation survey (Phoenix, 2022) indicates the vegetation within the proposed clearing area (excluding mudflats) is in Excellent to Good (Trudgen, 1991) condition. Excerpts of the survey descriptions, maps and representative photographs are available in Appendix D. According to available databases, there are no conservation significant flora records within the application area. No priority or threatened flora were identified in the application area during the flora and vegetation survey (Phoenix, 2022).

Priority Ecological Communities (PEC)

The supporting documentation (Leichhardt, 2024b) identified a portion of the Horseflat Land System of the Roebourne Plains (Horseflat PEC), which is a state-listed priority one (P1) ecological community (PEC) is mapped with the application area. The supporting documentation (Leichhardt, 2024b) indicates 11,720.6 hectares of the Horseflat PEC occurs within the study area of which 68.5 hectares (0.1%) is mapped within the application area footprint. According to the survey details (Phoenix, 2022), the Horseflat PEC occurs across a total area of 194,996.5 hectares within the local area. Given the extent of the Horseflat PEC in the local area, and nature of the proposed works, the proposed clearing of less than 3.5 ha will not have a significant impact on the Horseflat PEC.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to significantly impact local or regional flora and vegetation biodiversity. Given the size of the application area and known distribution of the above species, it is unlikely that the proposed clearing may have significant impact to the above species. Further, it is considered that any impacts of the proposed clearing on flora and vegetation can be managed through the below conditions.

Conditions

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

- avoidance and minimisation to reduce the impacts and extent of clearing,
- take hygiene steps to minimise the risk of the introduction and spread of weeds to adjacent vegetation,

- avoid clearing of riparian vegetation,
- revegetation and rehabilitation of areas cleared for temporary works.

3.2.2. Biological values – Biodiversity, Fauna - Clearing Principles (a and b)

Assessment

Phoenix Environmental Sciences Pty Ltd conducted a detailed terrestrial fauna and migratory shorebird survey in June 2023. The survey included the application area and identified 17 fauna habitats across the study area, five of which occur within the application area footprint. According to the fauna survey, the majority of the application area (44.7%) consists of Tussock grassland habitat. None of the habitat types within the application t area are considered as critical habitat for any conservation significant fauna species but may constitute broad foraging habitat for some species (Phoenix, 2022).

The five mapped habitat types are:

- Mudflat or salt flat
- Samphire shrubland (inland)
- Shrubland over spinifex grassland
- Shrubland over tussock grassland
- Tussock grassland

The fauna survey identified the Tussock grassland habitat type (42.7 per cent) as the primary fauna habitat identified with the application area (Phoenix, 2022).

A review of available databases and supporting documentation (Leichhardt, 2024b) indicates that a total of 53 conservation significant fauna species (39 migratory bird species, eight mammals, two birds, one fish, two reptiles and one invertebrate) have been recorded within the local area. These species are either listed under the state BC Act and/or Commonwealth EPBC Act, or as Priority species by DBCA or migratory species listed under International Agreements (MI).

The fauna habitat survey recorded two mammal species (Northern Quoll and Pilbara Lef nosed Bat), one reptile species (Lined Soil-crevice Skink) and 33 migratory waterbird species within the larger clearing footprint. All of the migratory waterbird species were recorded within the mudflat habitat type which occurs over ~21 per cent of the clearing area footprint (Phoenix, 2022).

Migratory Waterbirds

The 33 species of migratory waterbird protected under International Agreements, utilise the mudflat communities within the application area for foraging or roosting habitat or utilise it as transient habitat during migration between costal habitats. The majority of the migratory birds recorded do not breed within Australia (Commonwealth of Australia, 2015).

It is noted that the coastal mudflat habitat within the application area is well-represented within the local area and the greater Pilbara region. It is also acknowledged that disturbance activities within mudflats are likely to be limited to vehicular access, geotechnical investigations, and installation of groundwater monitoring wells that will require minor clearing of native vegetation that provides roosting and foraging habitat for migratory bird species. As none of these waterbird species breed within Australia, the proposed clearing is not considered likely to impact significant breeding habitat for these species. Noting the extent of the proposed clearing (3.5 ha over a ~166 ha footprint) and that abundant suitable habitat is available in the local and regional area, the proposed clearing is not considered to have a significant impact on breeding, foraging or roosting habitat for any conservation significant waterbird species.

Terrestrial fauna species

As advised the fauna habitat survey recorded the following significant fauna species within the application area:

- Northern quoll (*Dasyurus hallucatus*; listed as EN under EPBC Act and BC Act);
- Pilbara leaf-nosed bat (*Rhinonicteris aurantia* (Pilbara form); listed as VU under EPBC Act and BC Act);
- Lined Soil-crevice Skink (Dampier) (Notoscincus butleri) – Listed as Priority 4 species by DBCA
- Grey Falcon (Falco hypoleucos) – Listed as Vulnerable under the EPBC Act and BC Act

Northern quoll (*Dasyurus hallucatus*) (Endangered under the BC Act and EPBC Act) occurs in a variety of habitat types across its range, favouring rocky areas and eucalypt woodlands with suitable den resources that provide shelter and protection from predators including rock crevices, tree holes or occasionally termite mounds, and is predominantly nocturnal (DCCEEW, 2024g). Northern quolls do not have highly specific habitat requirements and they are opportunistic foragers that feed on a broad range of items switching dietary resources according to season

and availability. The critical habitat to survival includes rocky outcrops, tree hollows, hollow logs, termite mounds, goanna burrows and human dwellings. Given the application area does not provide critical habitat for northern quoll and given no clearing will occur in forest of Eucalyptus spp. over tall shrubland over grass land habitat which was associated with being close to creek lines, it is not considered likely that the proposed clearing will result in the loss of significant habitat for the species.

Pilbara leaf-nosed bat (*Rhinonicteris aurantia* (Pilbara form) (Vulnerable under the BC Act and EPBC Act) occurs throughout the Pilbara and adjacent upper Gascoyne regions of Western Australia. The species relies on underground roosts supporting warm, high humidity microclimates. Only relatively deep, complex caves and disused underground mines that contain such conditions are considered to be critical habitat. The Pilbara leaf-nosed bat hunts through riparian vegetation in gorges, and over hummock grassland and sparse tree-and-shrub savannah (DCCEEW, 2024i). The shrubland and hummock grassland within the application area may provide transient foraging habitat for the Pilbara leaf-nosed bat as it migrates through the landscape. However, given riparian vegetation along watercourses will be excluded from clearing (see Section 3.2.3), it is not considered likely that the proposed clearing will result in the loss of significant foraging habitat for the species.

The grey falcon (Falco hypoleucos) (Vulnerable under the BC Act and EPBC Act) occurs in arid and semi-arid inland Australia and is associated with timbered lowland plains such as tussock grassland, open woodland, and particularly Acacia shrublands that are crossed by tree-lined watercourses. The grey falcon roosts and nests in the tallest trees along watercourses, particularly river red gum (Eucalyptus camaldulensis) and coolibah (Eucalyptus coolabah) (DCCEEW, 2024h). The shrubland and hummock grassland within the application area may provide transient foraging habitat for the grey falcon as it migrates through the landscape. However, given riparian vegetation along watercourses will be excluded from clearing (see Section 3.2.3), it is not considered likely that the proposed clearing will result in the loss of significant habitat for the species.

Other priority listed species including the lined crevice skink may utilise the shrubland habitat and the grassland habitat within the application area. However, these habitats are not considered as be critical habitat for any of these species. Given the extent of the proposed clearing and the extent of similar habitat in the local area, it is not considered likely that the application area contains significant habitat for any of these the species.

Conclusion

The assessment and the survey details (Phoenix, 2023) indicate, the proposed clearing may result in impacts to suitable habitat for conservation significant fauna species including the northern quoll, lined soil-crevice skink, grey falcon, Pilbara leaf-nosed bat and migratory bird species. It is considered that the impacts of the proposed clearing on these species can be managed to be environmentally acceptable through permit conditioning that requires engagement of a fauna spotter, backfilling or covering all the test pits and bore holes and revegetating temporary cleared areas, as well as ensuring slow, progressive, directional clearing is undertaken to allow fauna to move into adjacent vegetation.

Given the above, the Delegated Officer determined that the proposed clearing does not constitute a significant residual impact to conservation significant fauna species.

Conditions

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

- directional clearing, which ensures slow, progressive, directional clearing is undertaken to allow fauna to move into adjacent vegetation ahead of the clearing activity to minimise impact to individuals
- engage a fauna spotter for the duration of clearing activities
- backfilling or covering all the test pits and bore holes to prevent fauna access
- revegetation and rehabilitation of areas cleared for temporary works

3.2.3. Land and water resources - Clearing Principles (f), (g) and (i)

Assessment

As the application area intersects a minor, non-perennial waterbody called Phillamunga soak, as well as a few minor non-perennial watercourses, some of the vegetation within the application area may be considered to be growing in, or in association with, an environment associated with a watercourse. Eramurra Creek, an ephemeral stream, also intersects the application area in multiple locations.

The application area is located entirely within the Eramurra Creek catchment, with a total catchment area of approximately 15,100 ha (Leichhardt, 2024b). It is also mapped with the Pilbara surface and Groundwater area,

therefore any clearing within the vicinity of watercourses would have potential impact to surface water quality within a proclaimed water resource under the RIWI Act.

Noting that the purpose of the proposed clearing is for geotechnical investigations, vehicular access tracks and installation of groundwater monitoring wells, it is considered unlikely that the proposed clearing will require removal of riparian vegetation that is associated with these non-perennial watercourses. This has been confirmed by the applicant, who has advised that the proposed clearing and geotechnical investigations will not interfere with or obstruct any non-perennial watercourses, drainage lines or the water table (Leichhardt, 2024b).

Given the proposal will not require clearing within the vicinity of watercourses, a management condition has been applied to the permit requiring the applicant to avoid clearing within 30 metres of riparian vegetation associated with non-perennial watercourses. With implementation of the above vegetation management condition and given the extent of the proposed clearing within a 161.32-hectare footprint, it is not considered likely that the proposed clearing will result in any significant or long-term impacts to surface or groundwater quality or to the ecological values of the vegetation communities associated with the non-perennial watercourses.

Noting that most of the mapped soil types within the application area are susceptible to land degradation resulting from erosion when vegetation cover is lost, the proposed clearing has the potential to facilitate land degradation. However, with the implementation of the vegetation management condition and given the condition of the vegetation and the extent of the proposed clearing within a 161.32-hectare footprint, it is not considered likely that the proposed clearing will result in any appreciable land degradation impacts.

Conclusion

The proposed clearing may result in the loss of vegetation growing in, or in association with an environment associated with a watercourse and the proposed clearing may facilitate the spread of invasive weeds into adjacent retained vegetation in the local area. For the reasons set out above, the proposed clearing is unlikely to result in appreciable land degradation or any significant or long-term impacts to the quality of surface or groundwater, or the ecological values of the riparian communities associated with watercourses.

It is considered that the impacts of the proposed clearing can be managed to be environmentally acceptable by avoiding the clearing of riparian vegetation, taking steps to minimise the risk of the introduction and spread of weeds and revegetating all areas cleared for temporary works. In considering the above, the Delegated Officer determined that the impacts of the proposed clearing on land and water resources are not significant.

Conditions

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

- weed control to ensure protocols are put in place to limit the introduction and transportation of weed-affected materials,
- vegetation management to protect riparian vegetation, and
- revegetation and rehabilitation to ensure areas cleared for temporary works are revegetated and rehabilitated within six months of the area no longer being required for the purpose for which it was cleared.

3.3. Relevant planning instruments and other matters

The proposed clearing is for geotechnical studies to support the planning stage of the Eramurra Solar Salt Project. This project is an evaporative solar project that utilises seawater to produce raw salt as a feedstock for dedicated processing facilities that will produce a high purity salt.

The clearing permit application was advertised on the department's website on 29 May 2024, inviting submissions from the public within a 21-day period. No submissions were received in relation to this application.

The City of Karratha (the city) advised that the proposed clearing is located within Reserve 52734, with a management order to the Pilbara Ports Authority (City of Karratha,2024). Since the proposed work is to be undertaken by Leichhardt Port Pty Ltd under the authority of Pilbara Ports Authority for the purposes of public works, the proposed clearing would be exempt from requiring a development approval, by virtue of section 6 of the *Planning and Development Act 2005* (City of Karratha,2024).

The department's Northwest Region advised that the proposed clearing footprint includes several watercourses, and it occurs within the proclaimed Pilbara groundwater and surface water areas under the Rights in Water and Irrigation Act 1914 (RIWI) (DWER,2024). To mitigate potential impacts to watercourses, riparian vegetation, groundwater and surface water quality, the best practice management of riparian and erosion should be used during clearing activities, tract construction and rehabilitation.

Best practice management should include:

- disturbance to natural drainage or adversely affecting the quality or quantity of water in any watercourse, dam, waterhole, spring, or subterranean source of supply should be avoided.
- disturbance to riparian vegetation should be avoided to maintain foreshore stability and protect important riparian habitats. Where possible, existing tracks are to be used.
- constructing any unavoidable creek crossings on relatively straight sections of a watercourse, not on meander bends.
- rehabilitating disturbed areas (tracks and excavations) as soon as practical after the campaign (DWER,2024).

Being in a proclaimed area under the RIWI Act, the application area is subject to licensing requirements under the RIWI Act. The applicant advised that no water license is required If this changes and the proponent intends to abstract groundwater or surface water, then a 5C license will be required under the RIWI Act. The installation of monitoring bores is exempt from licensing under the RIWI Act (DWER,2024).

The application area is located within the boundaries of the registered area of interest of the Wirrawandi Aboriginal Corporation RNTBC, acting on behalf of the Yaburara and Mardudhunera People native title claimants. The Yaburara and Mardudhunera People and the Wirrawandi Aboriginal Corporation RNTBC were invited to provided comment on the clearing permit application under section 24KA of the *Native Title Act 1993* (Cth). No comments were received.

The supporting information provided by the Leichhardt Port Pty Ltd indicates that all vegetation disturbance will occur within the Determined Claim Area WAD 127/1997 of the Yaburara and Mardudhunera people. Leichhardt has finalised negotiations for a Heritage Protection Agreement in May 2021 and a Social, Cultural Heritage Management Plan in April 2023. A Land Access Agreement is currently being negotiated with the Mardudhunera people (Leichhardt, 2024b).

Several Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal sites of significance are damaged through the clearing process.

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. It is located in the western Pilbara region of Western Australia, approximately 55 kilometres southwest of Karratha. Spatial data indicates the local area (50-kilometre radius from the centre of the area proposed to be cleared), retains approximately above 80 per cent of the original native vegetation cover.
Ecological linkage	No formal ecological linkages are not mapped within the local area, or the application area.
Conservation areas	The application area does not intersect a conservation area. The closest mapped conservation area is approximately 4.79 kilometres east of the application area.
Vegetation description	The flora and vegetation survey (Phoenix, 2022) indicates the proposed clearing area consists of 10 vegetation types: • AbTw- Mid sparse to open shrubland of *Acacia bivenosa*, with occasional *A. stellaticeps* and *A. coriacea* (s.l.), over low hummock grassland of *Triodia wiseana*. • AssCc- Variably present tall sparse shrubland to shrubland of *Acacia sclerosperma* subsp. *sclerosperma, A. coriacea* (s.l.), and *A. inaequilatera*, over low sparse grassland to closed grassland of *Cenchrus ciliaris*, *Dactyloctenium radulans*, and *C. setiger*. • AxEx- Mid sparse shrubland to open shrubland of *Acacia xiphophylla*, over low isolated forbs of *Sida fibulifera*, *Ptilotus exaltatus*, and *Rhynchosia minima*, over low sparse to open tussock grassland of *Eragrostis xerophila*,*Dichanthium sericeum* subsp. *Humilius* • EvAcCf- Variably present open forest of *Eucalyptus victrix* and/or *E. camaldulensis* (s.l.), over tall variably present open shrubland of *Acacia coriacea* (s.l.), over mid grassland to closed grassland of *Chrysopogon fallax*, *Eriachne flaccida*, and *Cenchrus* spp. • Ex- Low isolated forbs of *Sida fibulifera*, *Rhynchosia minima*, and *Indigofera trita*, over low tussock grassland to closed tussock grassland of *Eragrostis xerophila*, *Dichanthium sericeum* subsp. *humilius*, and *Sorghum plumosum*. • Mudflat- Mudflat • Mudflat/algal mat- Mudflat/algal mat • Te- Variably present mid isolated shrubs of *Acacia coriacea* (s.l.) and *A. bivenosa*, over mid isolated forbs of *Evolvulus alsinoides* var. *villosicalyx*, *Arivela viscosa*, and *Rhynchosia minima*, over mid open to closed hummock grassland of *Triodia epactia* and *Cenchrus ciliaris*. • Tspp- Low open shrubland to shrubland of *Tecticornia* spp., variably with *Surreya diandra* and *Frankenia pauciflora*, over variably present isolated tussock grasses to tussock grassland of *Eragrostis falcata* and *Xerochloa laniflora*. • Tw- Isolated low shrubs of *Abutilon lepidum*, *Indigofera onophyla*, and *Triumfetta clementii*, over isolated forbs of *Trichodesma zeylanicum* var. *zeylanicum*, *Ptilotus auriculifolius* or *clementi*i, and *Evolvulus alsinoides* var. *villosicalyx*, over low hummock grassland of *Triodia wiseana*. Excerpts of the survey descriptions and maps are available in Appendix D. This is consistent with the mapped vegetation types: • Abydos Plain-Roebourne 175 described as short bunch grassland/Savana/grass plain (Pilbara). Annual grasses *Enneapogon* spp.

<table>
<tr><th>Characteristic</th><th>Details</th></tr>
<tr><td></td><td>
Aristida spp. etc on dry plains and saltwater grasses Sporobolus virginicus on the coast.
• Abydos Plain-Roebourne 127 described as Tidal mud flat such as bare areas and mud flats.
• Abydos Plain-Roebourne 93 described as Hummock grassland with scattered shrubs or mallee Triodia spp. Acacia spp., Grevillea spp. Eucalyptus spp

The mapped vegetation types retain approximately 99 per cent of the original extent. (Government of Western Australia, 2019)
</td></tr>
<tr><td>Vegetation condition</td><td>
Supporting documents supplied by the applicant (Phoenix, 2022) indicates that the vegetation within the proposed clearing area is likely to range from Good to Excellent (Trudgen, 1991) condition based on the surveys undertaken for the Eramurra Solar Salt project, described as per the below table.
<table>
<tr><th>Condition Rating</th><th>Within Permit Area (ha)</th></tr>
<tr><td>Excellent</td><td>110.55</td></tr>
<tr><td>Very Good</td><td>11.04</td></tr>
<tr><td>Good</td><td>3.73</td></tr>
<tr><td>Poor</td><td>-</td></tr>
<tr><td>Completely Degraded</td><td>-</td></tr>
<tr><td>N/A</td><td>36.00</td></tr>
<tr><td>TOTAL</td><td>161.32</td></tr>
</table>
The full Trudgen (1991) condition rating scale is provided in Appendix E.
Representative mapping is available in Appendix F.
</td></tr>
<tr><td>Climate and landform</td><td>
The application area occurs within the Pilbara bioregion and the Roebourne subregion. The climate of the Roebourne subregion is defined as arid (semi-desert) tropical with highly variable rainfall and cyclonic activity, primarily over summer (Kendrick and Stanley, 2001). The mean annual maximum temperature is 34°C and mean annual minimum temperature is 18.9°C, while the mean annual rainfall is approximately 275 millimetres.
</td></tr>
<tr><td>Soil description and land degradation risk</td><td>
The following soil systems are mapped within the application area:
• Cheerawarra System (286Ch), described as Sandy coastal plains and saline clay plains supporting soft and hard spinifex grasslands and minor tussock grasslands and comprising approximately 70 per cent of the application area
• Littoral System (286Li), described as Bare coastal mudflats (unvegetated), samphire flats, sandy islands, coastal dunes and beaches, supporting samphire low shrublands, sparse acacia shrublands and mangrove forests and comprising approximately 12 per cent of the application area
• Horseflat System (281Hf) described as Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands and comprising approximately 12 per cent of the application area
• Rocklea System (289 Rk), described as Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs and comprising approximately 6 per cent of the application area.

While the mapped soils are generally not prone to land degradation, sandy coastal plains and saline clay plains within Cheerawarra system and coastal dunes within litoral system may be susceptible to wind erosion if the vegetation cover is depleted. Non-gilgaied plains, alluvial plains and dissected slopes within the Horseflat System are also
</td></tr>
</table>

Characteristic	Details
	moderately to highly susceptible to wind erosion if vegetation cover is depleted (DPIRD, 2024).
Waterbodies and hydrogeography	The desktop assessment, supporting documents and aerial imagery indicate that a minor non-perennial waterbody called Phillamunga soak, as well as a few minor, non-perennial watercourses transect the area proposed to be cleared. Eramurra Creek, an ephemeral stream, also intersects the application area in multiple locations (Phoenix, 2022). The application area also intersects saline coastal flats associated with the coastal flats. However, the application area does not transect any mapped wetlands, with the closest mapped wetland being the Millstream Pools, approximately 105 kilometres south-east of the application area. The application area is mapped within the Pilbara Surface Water Area and the Pilbara Groundwater Area proclaimed under the RIWI Act but does not transect any water resources proclaimed under either the *Metropolitan Water Supply Sewerage and Drainage Act 1909* or *Country Areas Water Supply Act 1947* (CAWS Act). Groundwater salinity within the application area is mapped at 1000 to 3000 milligrams per litre total dissolved solids.
Flora	According to available databases and survey detail, a total of 15 conservation listed flora species have been recorded within the local area, comprising three priority one (P1) flora, 11 priority three (P3) flora and one priority four (P4) flora species (Western Australian Herbarium, 1998-). None of these existing records occur within the application area, with the closest record being *Rostellularia adscendens var. latifolia (P3),* recorded approximately 0.2 kilometres west from the application area. No threatened or priority flora species were recorded in the application area during the detailed flora and vegetation survey conducted for the Eramurra Solar Salt Project, which included the application area (Phoenix, 2022).
Ecological communities	No Threatened Ecological Communities (TEC) or buffers are mapped over the application area, or within the local area. Horseflat Land System of the Roebourne Plains, which is a state-listed priority one (P1) ecological community (PEC) is mapped with the application area.
Fauna	The desktop assessment identified a total of 53 conservation significant fauna species that had previously recorded within the local area. These include 39 migratory bird species, eight mammals, two birds, one fish, two reptiles and one invertebrate. The closest record is an occurrence of a Lined soil-crevice skink (*Notoscincus butleri*), approximately 0.07 kilometres away from the application area.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Pilbara	17,808,657.04	17,731,764.88	99.57	1,801,714.98	10.12

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
Vegetation complex					
Abydos Plain-Roebourne_175*	507,860.16	507,466.80	99.92	40,277.79	7.93
Abydos Plain- Roebourne_127*	177,749.75	159,595.04	89.79	3,703.79	2.08
Abydos Plain-Roebourne _93	3,042,114.27	3,038,471.67	99.88	59,536.96	1.96

*Government of Western Australia (2019)

A.3. Flora analysis table

With consideration for the site characteristics set out above and relevant datasets (see Appendix H.1), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features ? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Rostellularia adscendens var. latifolia	P3	Y	Y	Y	0.206	1	Y
Eremophila forrestii subsp. viridis	P3	Y	Y	Y	0.315	1	Y
Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3	Y	Y	Y	1.115	3	Y

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

A.4. Fauna analysis table

With consideration for the site characteristics set out above and relevant datasets (see Appendix H.1), impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Notoscincus butleri	P4	Y	Y	0.07	17	Y
Dasyurus hallucatus	EN	Y	Y	6.23	70	Y
Falco hypoleucos	VU	Y	Y	22.91	2	Y
Rhinonicteris aurantia (Pilbara form)	VU	Y	Y	19.47	6	N/A
Leggadina lakedownensis	P4	Y	Y	9.55	6	N/A
Calidris canutus	EN	Y	Y	2.17	10	Y
Calidris ferruginea	CR	Y	Y	4.43	12	Y
Calidris tenuirostris	CR	Y	Y	1.36	21	Y
Charadrius leschenaultii	VU	Y	Y	0.23	35	Y
Charadrius mongolus	EN	Y	Y	5.43	4	Y
Falco peregrinus	OS	Y	Y	1.66	5	Y
Pseudomys chapmani	P4	Y	Y	14.28	3	N/A
Lagorchestes conspicillatus leichardti	P4	Y	Y	15.01	1	N/A
Macroderma gigas	VU	Y	Y	25.93	3	N/A
Numenius madagascariensis	CR	Y	Y	0.31	69	Y
Ozimops cobourgianus	P1	Y	Y	4.95	4	Y

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Migratory waterbirds (25)	MI	Y	Y	-	-	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, OS: other specially protected species P: priority

A.5. Ecological community analysis table

Community name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Horseflat Land System of the Roebourne Plains	P1	Y	Y	Y	0		Y

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		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The overall footprint of the area proposed to be cleared comprises 161.32 ha of tidal mudflats and short bunch grassland that are well-represented in the local area and region, with a portion of the application area mapped as the 'Horseflat Land System of the Roebourne Plains' (Priority 3) priority ecological community (PEC). The area proposed to be cleared does not contain habitat which is likely to be significant for priority flora and conservation significant fauna species and is not considered to comprise a high level of biodiversity.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (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."* Assessment: The area proposed to be cleared contain suitable habitat for a number of conservation significant fauna species, however, the habitat is not considered significant for any of these species (see Appendix A.4).	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: There are no records of threatened flora listed under the BC Act within the application area, with no threatened flora species identified during the flora and vegetation survey.	Not likely to be at variance	No
Principle (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."* Assessment: No threatened ecological communities are mapped within the area proposed to be cleared. The flora and vegetation survey did not identify vegetation dominated by species indicative of a threatened ecological community.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Environmental value: significant remnant vegetation and conservation areas		
Principle (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."* Assessment: The extent of the mapped vegetation type and native vegetation in the region is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (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."* Assessment: The application area does not intersect any conservation areas. The nearest conservation area to the application area is 4.79 km away, in which case the proposed clearing is not likely to have an impact on the environmental values of any conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given non-perennial watercourses are recorded within and in close proximity to the application area, the vegetation may be considered to be growing in association with an environment associated with a watercourse.	May be at variance	Yes *Refer to Section 3.2.3, above.*
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are having very low land degradation risk except low to moderately susceptibility to wind erosion if the vegetation cover is depleted. Noting the extent of the application area, nature of the proposed clearing and the condition of the vegetation, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	Yes *Refer to Section 3.2.3, above.*
Principle (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."* Assessment: Given non-perennial water courses are recorded within and in close proximity to the application area, the proposed clearing may impact surface and groundwater quality.Conditions have been imposed which do not allow for clearing of riparian veg which mitigates this risk. Noting the extent of the application area, nature of the proposed clearing and the imposed conditions to avoid the clearing of riparian vegetation, the proposed clearing is not likely to cause deterioration in the quality of surface or underground water.	Not likely to be at variance	Yes *Refer to Section 3.2.3, above.*
Principle (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."* Assessment: The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.	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.
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. Flora and Vegetation Survey excerpts (Pheonix, 2022)

The flora and vegetation survey (Pheonix,2022) indicates the application area consists of ten vegetation types, described as:

Vegetation type	Description	Within Permit Area (ha)	% of total mapped
AbTw	Mid sparse to open shrubland of *Acacia bivenosa*, with occasional *A. stellaticeps* and *A. coriacea* (s.l.), over low hummock grassland of *Triodia wiseana*.	11.59	3.54
AssCc	Variably present tall sparse shrubland to shrubland of *Acacia sclerosperma* subsp. *sclerosperma*, *A. coriacea* (s.l.), and *A. inaequilatera*, over low sparse grassland to closed grassland of **Cenchrus ciliaris*, *Dactyloctenium radulans*, and **C. setiger*.	3.73	2.72
AxEx	Mid sparse shrubland to open shrubland of *Acacia xiphophylla*, over low isolated forbs of *Sida fibulifera*, *Ptilotus exaltatus*, and *Rhynchosia minima*, over low sparse to open tussock grassland of *Eragrostis xerophila*, *Dichanthium sericeum* subsp. *Humilius**.	24.27	5.53
EvAcCf	Variably present open forest of *Eucalyptus victrix* and/or *E. camaldulensis* (s.l.), over tall variably present open shrubland of *Acacia coriacea* (s.l.), over mid grassland to closed grassland of *Chrysopogon fallax*, *Eriachne flaccida*, and *Cenchrus* spp.	0.03	0.05
Ex	Low isolated forbs of *Sida fibulifera*, *Rhynchosia minima*, and *Indigofera trita*, over low tussock grassland to closed tussock grassland of *Eragrostis xerophila*, *Dichanthium sericeum* subsp. *humilius*, and *Sorghum plumosum*.	68.48	1.44
Mudflat	Mudflat	2.32	3.76
Mudflat/algal mat	Mudflat/algal mat	33.68	3.25
Te	Variably present mid isolated shrubs of *Acacia coriacea* (s.l.) and *A. bivenosa*, over mid isolated forbs of *Evolvulus alsinoides* var. *villosicalyx*, *Arivela viscosa*, and *Rhynchosia minima*, over mid open to closed hummock grassland of *Triodia epactia* and **Cenchrus ciliaris*.	5.25	1.49
Tspp	Low open shrubland to shrubland of *Tecticornia* spp., variably with *Surreya diandra* and *Frankenia pauciflora*, over variably present isolated tussock grasses to tussock grassland of *Eragrostis falcata* and *Xerochloa laniflora*.	8.25	6.42
Tw	Isolated low shrubs of *Abutilon lepidum*, *Indigofera onophyla*, and *Triumfetta clementii*, over isolated forbs of *Trichodesma zeylanicum* var. *zeylanicum*, *Ptilotus auriculifolius* or *clementii*, and *Evolvulus alsinoides* var. *villosicalyx*, over low hummock grassland of *Triodia wiseana*.	3.73	1.13
	TOTAL	**161.32**	

*Indicates a weed species

Table 2: Description of representative flora vegetation types identified in the application area

Figure 2.1: Vegetation type AbTw

Figure 2.2: Vegetation Type AssCc

Figure 2.3: Vegetation Type- AxEx

Figure 2.4: Vegetation Type- EvAcCf

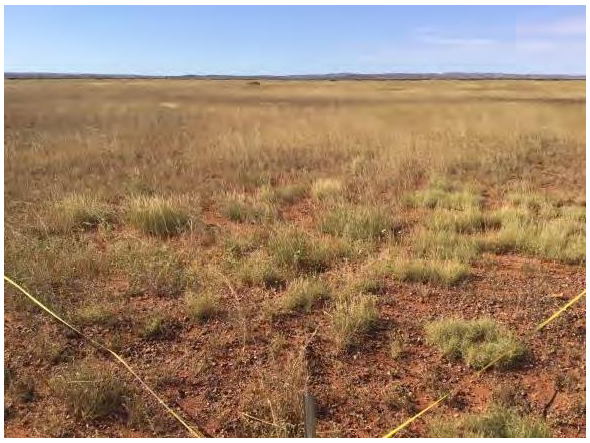

Figure 2.5: Vegetation Type- Ex

Figure 2.6: Vegetation Type- Te

Figure 2.7: Vegetation Type- Tspp

Figure 2.8: Vegetation Type- Tw

Figure 2. Representative photographs of vegetation types identified in the application area (Phoenix, 2022)

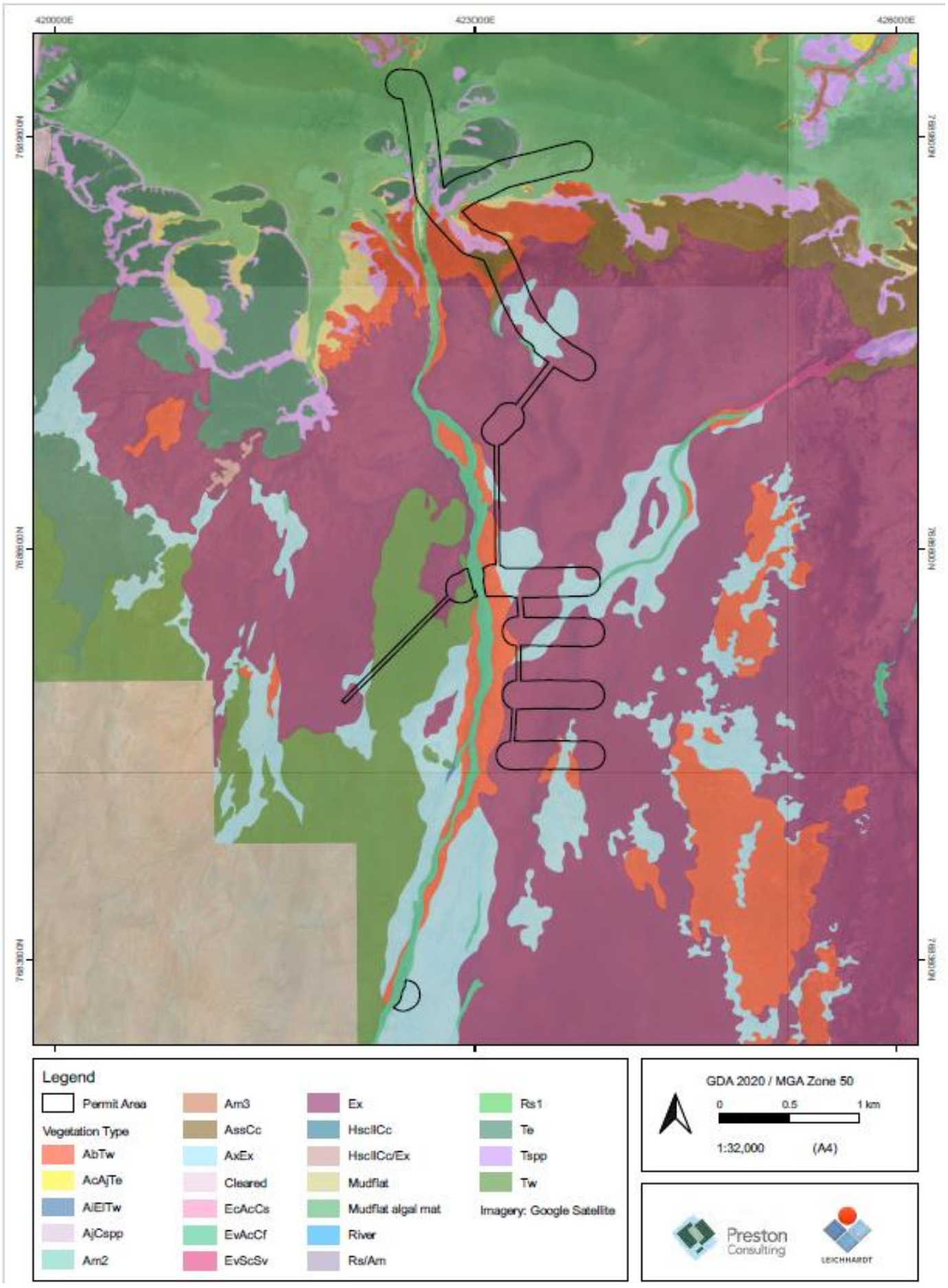

Figure 3: Vegetation types identified within the application area

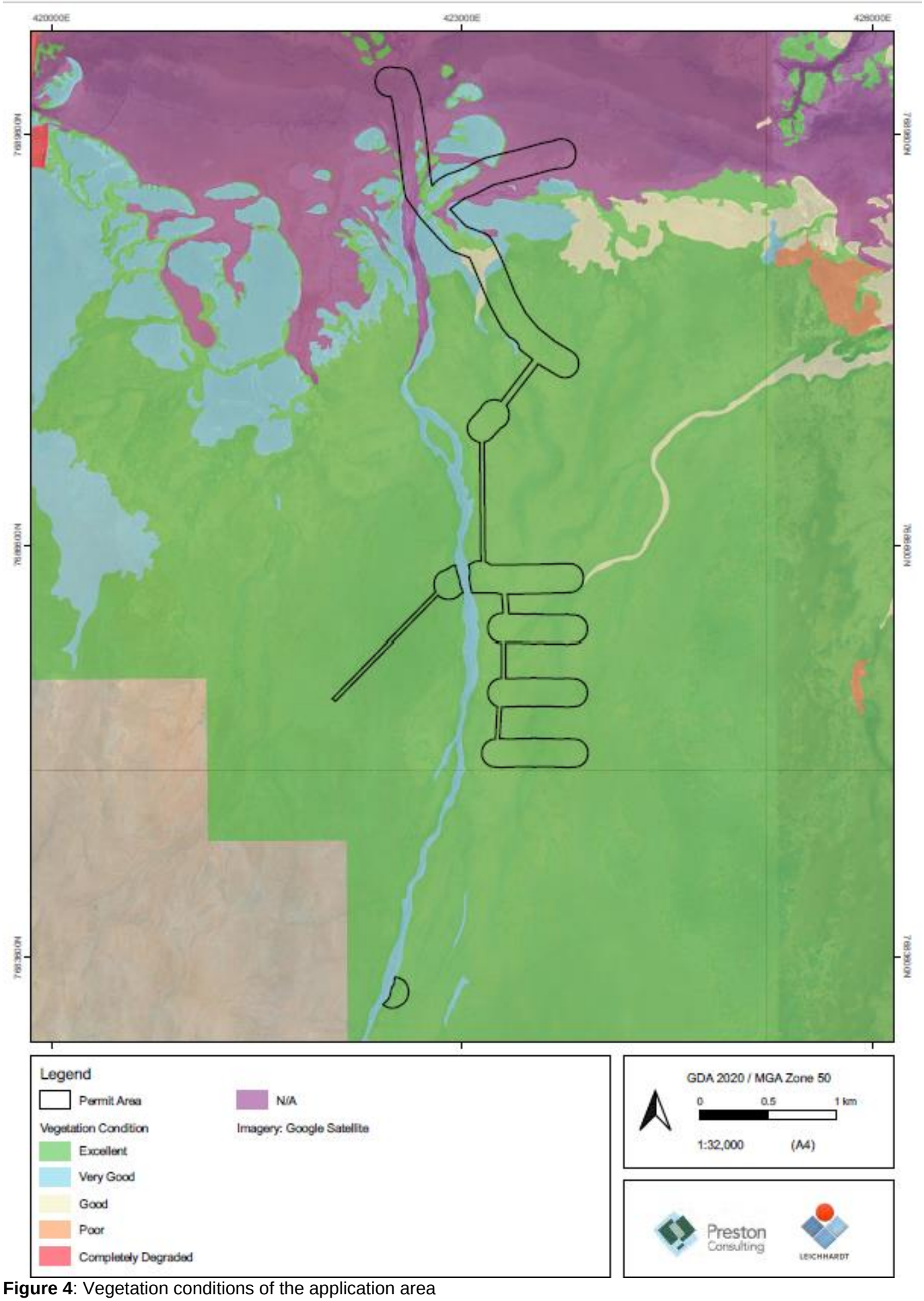

Figure 4: Vegetation conditions of the application area

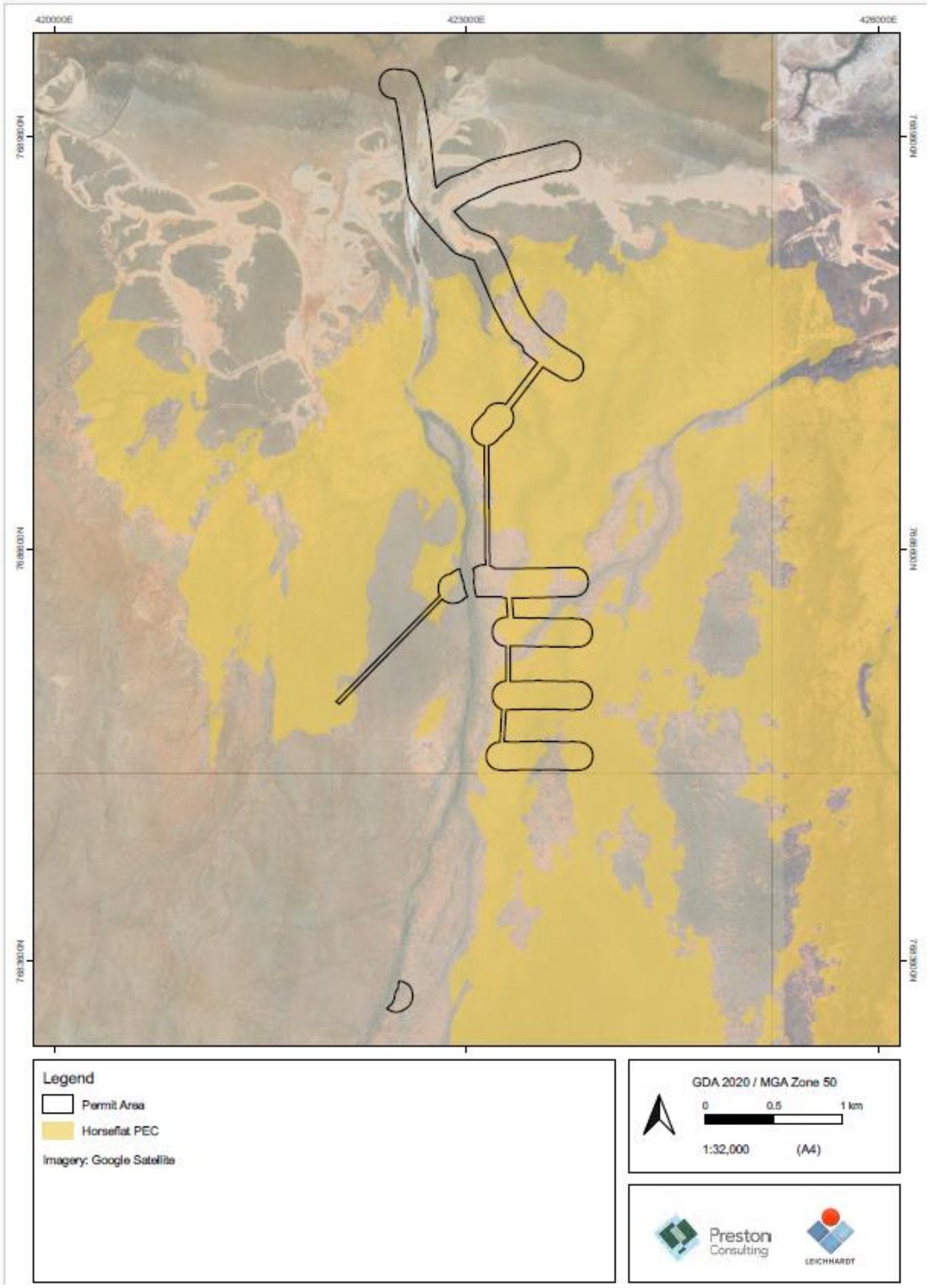

Figure 5: Horseflat PEC within the application area

Appendix E. Fauna Survey excerpts (Phoenix, 2023)

The fauna survey (Phoenix, 2023) indicates the application area consists of five habitat types, described as:

- **Mudflat or salt flat**: Bare, unvegetated mudflats and salt flats
- **Samphire shrubland (inland)**: Low open shrubland to shrubland of *Tecticornia* spp., variably with *Surreya diandra* and *Frankenia pauciflora*, over variably present isolated tussock grasses to tussock grassland of *Eragrostis falcata* and *Xerochloa laniflora*.
- **Shrubland over spinifex grassland**: Mid sparse to open shrubland of *Acacia bivenosa*, with occasional *A. stellaticeps* and *A. coriacea* (s.l.), over low hummock grassland of *Triodia wiseana*. Variably present mid isolated shrubs of *Acacia coriacea* and *A. bivenosa*, over mid isolated forbs of *Evolvulus alsinoides var. villosicalyx*, *Arivela viscosa*, and Rhynchosia minima, over mid open to closed hummock grassland of *Triodia epactia* and *Cenchrus ciliaris*. Tall sparse shrubland to shrubland of *Acacia coriacea*, *A. ligulata*, and/or *A. sclerosperma* subsp. *sclerosperma*, over low isolated shrubs to open shrubland of *Aerva javanica*, *Corchorus walcottii*, and *Rhagodia eremaea*, over low sparse hummock grassland to hummock grassland of *Triodia epactia* with *Cenchrus ciliaris* and *Whiteochloa airoides*.
- **Shrubland over tussock grassland**: Variably present tall sparse shrubland to shrubland of *Acacia sclerosperma* subsp. *sclerosperma, A. coriacea*, and *A. inaequilatera*, over low sparse grassland to closed grassland of *Cenchrus ciliaris*, *Dactyloctenium radulans*, and *C. setiger*
  Low sparse to open shrubland of *Aerva javanica* and *Solanum lasiophyllum*, over low sparse grassland to grassland of *Cenchrus* spp. with *Whiteochloa airoides* and/or *Sorghum plumosum*.
  Mid sparse shrubland to open shrubland of *Acacia xiphophylla*, over low isolated forbs of *Sida fibulifera*, *Ptilotus exaltatus*, and *Rhynchosia minima*, over low sparse to open tussock grassland of *Eragrostis xerophila*, *Dichanthium sericeum* subsp. *humilius*, and *Aristida contorta*.
  Mid to tall open shrubland to shrubland of *Myoporum montanum*, *Acacia ampliceps*, and *Rhagodia eremaea*, over low isolated chenopod shrubs of *Tecticornia* spp. and *Threlkeldia diffusa*, over mid tussock grassland of *Sporobolus virginicus* with occasional *Cenchrus ciliaris* and *Triodia epactia*.
- **Tussock grassland**: Isolated low shrubs of *Abutilon lepidum, Indigofera monophylla*, and *Triumfetta clementii*, over isolated forbs of *Trichodesma zeylanicum* var. *zeylanicum*, *Ptilotus auriculifolius* or *P. clementii*, and Evolvulus *alsinoides* var. *villosicalyx*, over low hummock grassland of *Triodia wiseana*. Hybrid or mosaic of two vegetation types. Low isolated forbs of *Sida fibulifera, Rhynchosia minima*, and *Indigofera trita*, over low tussock grassland to closed tussock grassland of *Eragrostis xerophila*, *Dichanthium sericeum* subsp. *humilius*, and *Sorghum plumosum*.

Figure 6.1: Mudflat or salt flat

Figure 6.2: Samphire shrubland (inland)

Figure 6.3: Shrubland over spinifex grassland

Figure 6.4.1: Shrubland over tussock grassland

Figure 6.4.2: Shrubland over tussock grassland

Figure 6.5: Tussock grassland

Figure 6: Representative photographs of fauna vegetation types identified in the application area (Phoenix, 2023)

Habitat Type	Within Permit Area (ha)	% of total mapped
Mudflat or salt flat	35.99	1.49
Samphire shrubland (inland)	8.25	2.79
Shrubland over spinifex grassland	16.94	0.32
Shrubland over tussock grassland	28.03	0.74
Tussock grassland	72.12	0.56
TOTAL	**161.32**	-

Table 3: Fauna habitats recorded within the application area

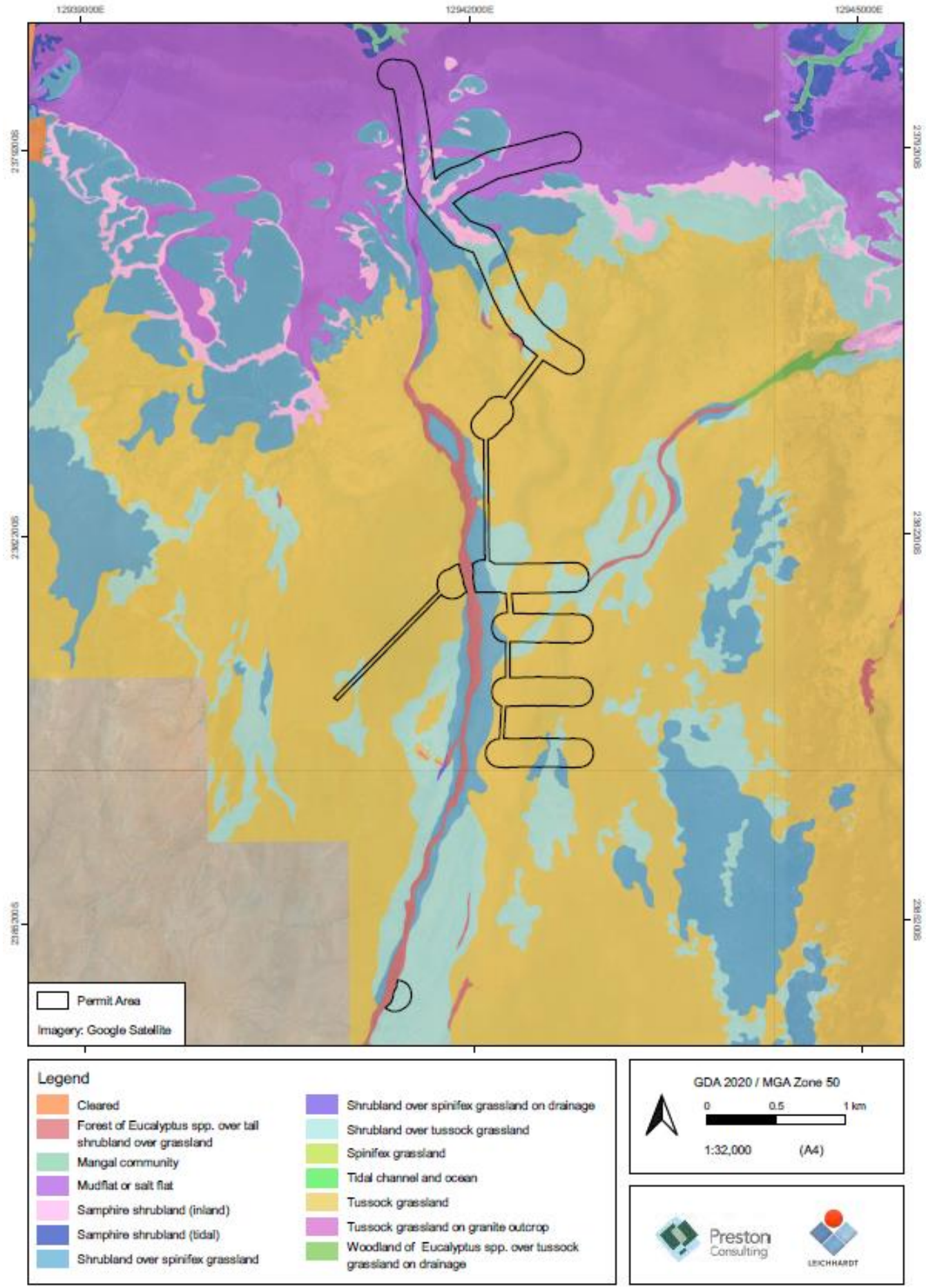

Figure 7: Fauna habitats within the application area

Appendix H. Sources of information

H.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- 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)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- 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
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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