



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: CPS 10795/1
File Number: DWERVT15834
Duration of Permit: From 25 May 2025 to 25 May 2027

PERMIT HOLDER

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

LAND ON WHICH CLEARING IS TO BE DONE

Lot 18 on Plan 220344, South Murchison

AUTHORISED ACTIVITY

The permit holder must not clear more than 61.68 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

CONDITIONS

1. 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.

2. 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.

3. Directional clearing

The permit holder must conduct clearing activities in a slow, progressive manner to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

4. Flora management

Where *Hemigenia tysonii* or *Gunniopsa divisa* individuals have been identified within the area cross-hatched red on Figure 2 of Schedule 1 and their written locations provided to the CEO within the report 'Reconnaissance Flora and Vegetation and Basic fauna Assessment, Square Kilometre Array Project' (Aurora Environmental, September 2024), the Permit Holder shall ensure that no clearing of these individuals or within 10 metres of these individuals occurs, unless approved by the CEO.

5. Erosion management

The permit holder must commence activities related to the purpose of the clearing, no later than three (3) months after undertaking the authorised clearing activities to reduce the potential for erosion.

6. 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	<p>(a) the species composition, structure, and density of the cleared area;</p> <p>(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;</p> <p>(c) the date that the area was cleared;</p> <p>(d) the size of the area cleared (in hectares);</p> <p>(e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 1; and</p> <p>(f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> in accordance with condition 2.</p>

7. Reporting

The permit holder must provide to the *CEO* the records required under condition 6 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 <i>Environmental Protection Act 1986</i> .
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.
fill	means material used to increase the ground level, or to fill a depression.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
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.
weeds	means any plant – <ul style="list-style-type: none"> (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; 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



Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

2 May 2025

SCHEDULE 1

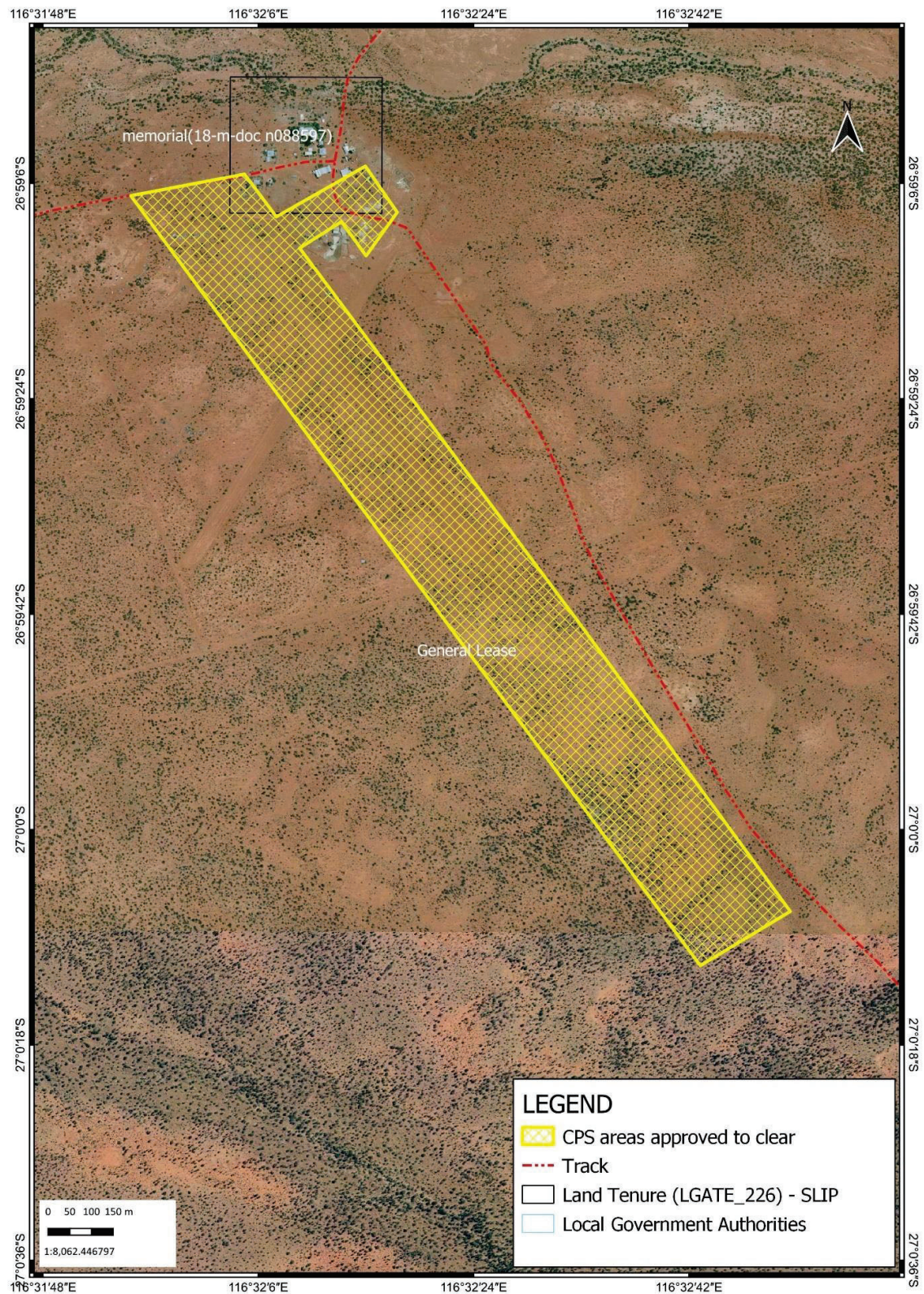


Figure 1: Map of the boundary of the area within which clearing may occur

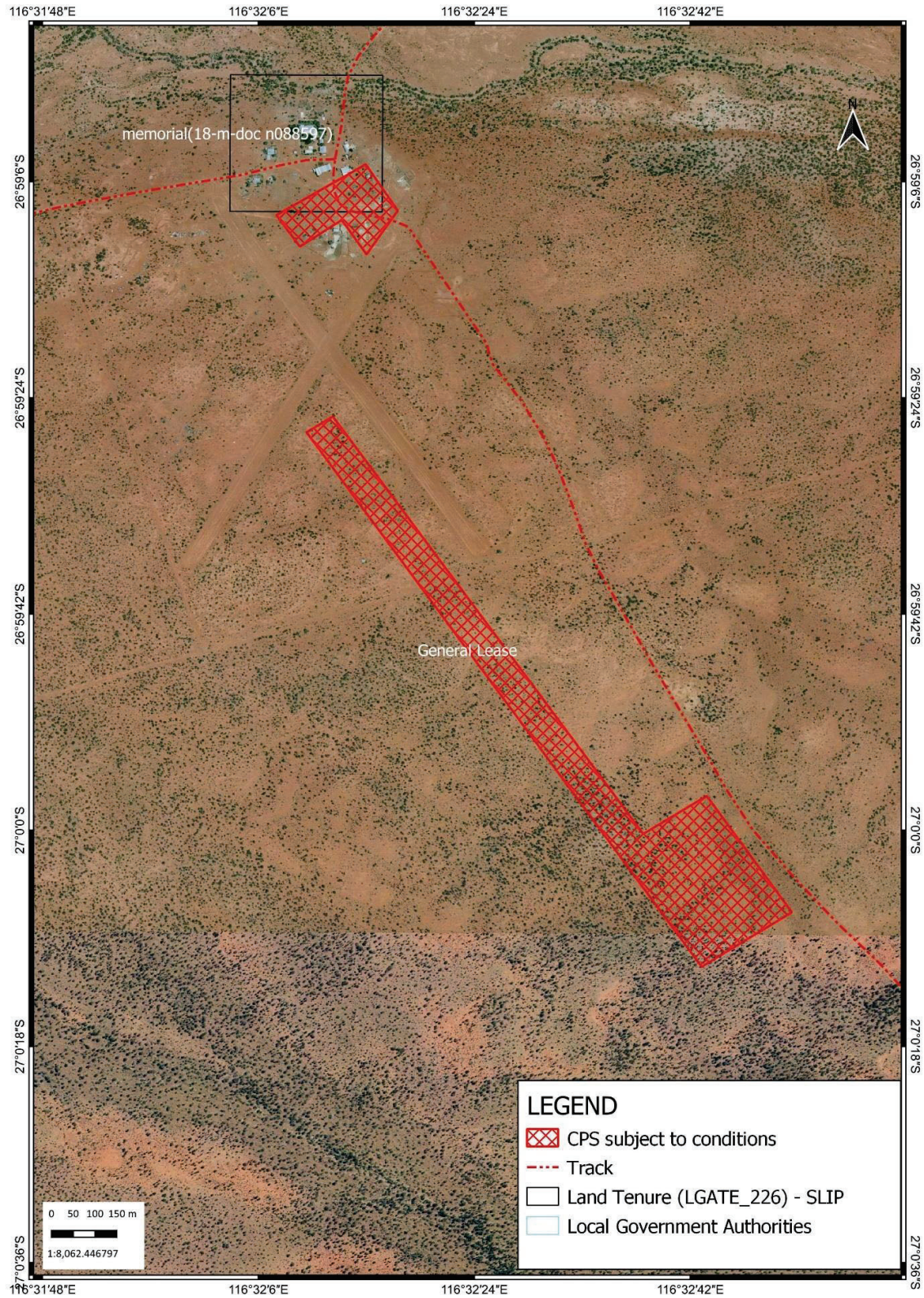


Figure 2: Map of the boundary of the area within which conditions apply



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10795/1
Permit type:	Area permit
Applicant name:	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Application received:	8 October 2024
Application area:	61.68 hectares of native vegetation
Purpose of clearing:	Extension of an airstrip
Method of clearing:	Mechanical
Property:	Lot 18 on Plan 220344
Location (LGA area/s):	Shire of Murchison
Localities (suburb/s):	South Murchison

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single contiguous 61.68 hectare area within Lot 18 on Plan 220344 (see Figure 1, Section 1.5). The proposed clearing is to allow for the expansion of a pre-existing airstrip and associated access infrastructure and drainage, to support the SKA-1 Low Project (Square Kilometre Array low frequency telescope).

1.3. Decision on application

Decision:	Granted
Decision date:	2 May 2025
Decision area:	61.68 hectares of native vegetation 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). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and one submission was received. Consideration of matters raised in the public submission is summarised in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix I.1), the findings of a flora and vegetation survey, fauna assessment and targeted *Idiosoma* survey, the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing:

- will remove foraging and transient habitat for southern whiteface, however, impacts to this species are unlikely to be significant;

- will result in the clearing of Priority 3 *Gunniopsis divisa* and *Hemigenia tysonii* individuals, however, the proposed clearing is unlikely to impact upon the conservation status of these species;
- is unlikely to significantly impact ecological values or water quality within nearby watercourses; and
- may result in water and/or wind erosion.

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 the values listed above, subject to appropriate conditions being placed on the permit. The applicant has suitably demonstrated avoidance and minimisation measures.

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

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- staged clearing to minimise erosion;
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity; and
- clearing of identified individuals of *Gunniopsis divisa* and *Hemigenia tysonii*, and a 10-metre buffer surrounding these individuals, is prohibited in the area hatched red on Figure 1 of Schedule 1.

1.5. Site map

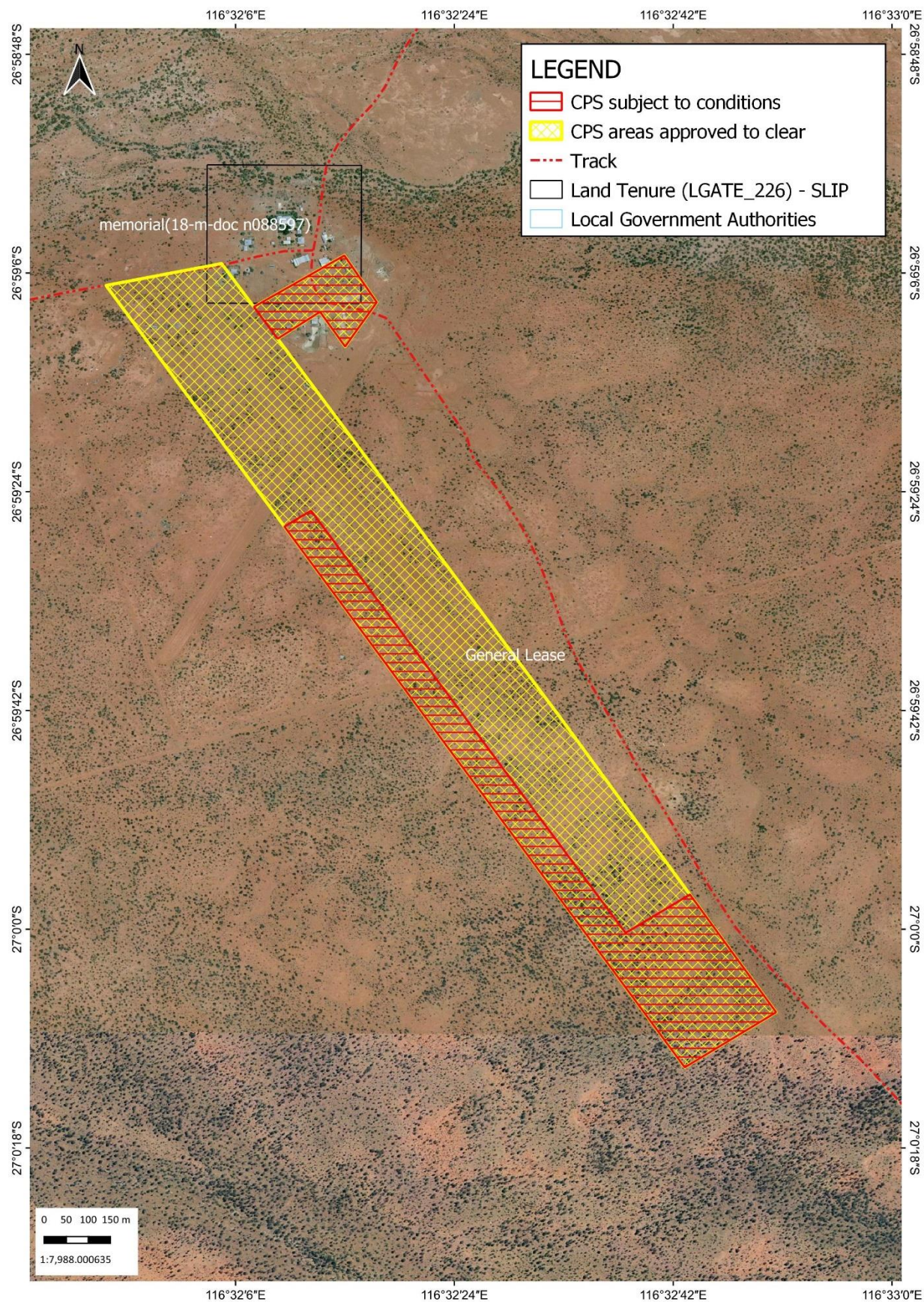


Figure 1. Map of the application area. The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit. The areas hatched red indicate areas within which specific conditions apply.

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)

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, 2020)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant submitted the following information as part of their application to demonstrate consideration of avoidance and mitigation measures (CSIRO, 2024a):

- Selection of clearing location and extent:
 - the location is fixed as the existing airstrip is proposed to be upgraded. A new location for the airstrip would result in a greater area of clearing.
 - the clearing extent has been determined using a preliminary concept design.
 - the clearing extent will be refined as detailed design of the airstrip upgrade project progresses.
- Alternatives to clearing considered:
 - no alternatives to clearing are possible. The existing airstrip is inadequate to cater for the increased flights needed to support the SKA project.
- Changes made to the location or amount of clearing to reduce the impact the clearing:
 - as indicated above, the location of the project is fixed as it involves the upgrade of the existing airstrip.
 - the clearing extent has been determined based on a preliminary concept design.
 - refinement of the clearing requirements will be undertaken as the detailed design phases progresses, taking into consideration the construction and drainage requirements.
- Measures considered to reduce the clearing impacts:
 - upgrading the existing airstrip in favour of constructing a new airstrip, which would require a greater area of clearing
 - limiting clearing to the minimum area required for the upgrade, noting that detailed design for the airstrip upgrade has not yet been completed and may further reduce clearing requirements.

During the assessment, the department requested the following further information regarding avoidance and minimisation measures:

1. Why is a larger airstrip needed to accommodate increased flights to support the project – could improved flight scheduling achieve the same effect? Will there be larger planes landing?
2. In the supporting documentation it is stated that “The actual extent of clearing needed for the airstrip upgrade is currently unknown due to aspects related to runway design and drainage requirements. Less clearing may be needed than being applied for, pending the results of flood modelling and drainage design”. Is it possible to submit more detailed designs before the clearing permit is issued to ensure that unnecessary clearing is not granted?

The applicant submitted the following in response to the above (CSIRO, 2024b):

1. The applicant advised the following:

There will be larger aircrafts operating on the airstrip. The aircraft operations currently supported by the aerodrome include small charter aircraft, with up to nine passenger seats conducting Fly-in Fly-out (FIFO) operations, predominantly from Geraldton. The proposed upgrade works will enable access by larger aircraft with a passenger capacity of around 19 seats, with FIFO flights to be conducted to Boolardy to originate from Geraldton and Perth. In Western Australia, a common aircraft used on similar regional routes with 19 seats is the Beechcraft 1900 (B1900) and there are several operators of this aircraft in the state. Hence, to accommodate a Beech 1900, 19-seat (or similar sized) Code 2 aircraft, the aerodrome physical characteristics and facilities must comply with relevant standards and be adequate for aircraft safety.

2. The applicant submitted a final design drawing of the area required to be cleared for the runway (area outlined in black in Figure 2 below). However, the applicant did not further refine the application area from the original area proposed, advising the following:

While the smaller footprint provided is our current intended impact on site, we have limited survey data and the land is very flat, so there may be some need to shape the drainage with the contractor while on site. Therefore, could we please keep the original application area.

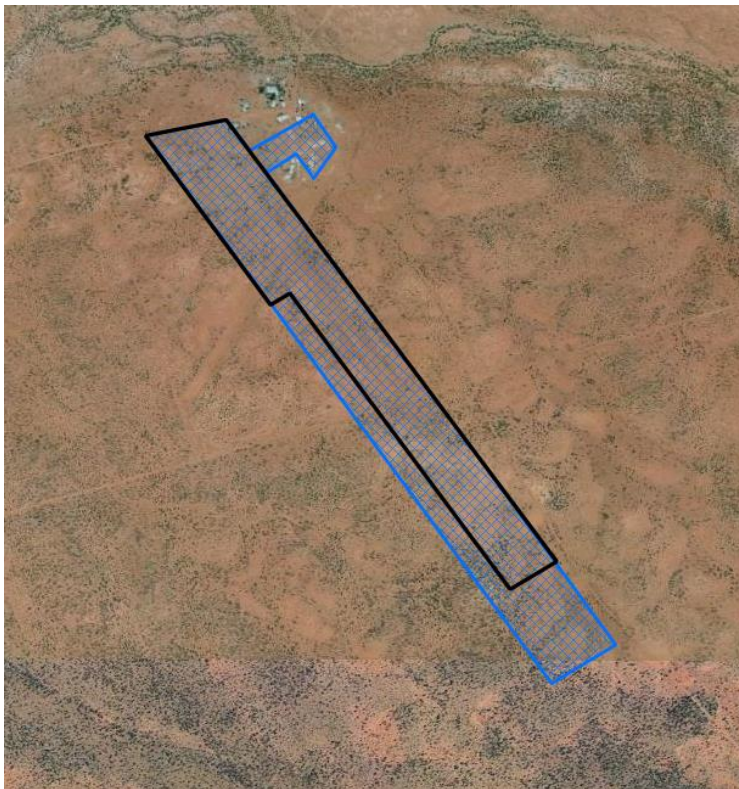


Figure 2. Application area (blue hatched area) and area in which clearing is definitely required to be undertaken for the runway upgrades.

Noting the above, the Department acknowledges that clearing is required to be undertaken within the area outlined black in Figure 2 above for runway upgrades, and that some limited further clearing may be undertaken on an 'as required' basis in the area outside of this within the application area (outlined blue). This has been factored into a flora management condition on the permit, where no clearing of identified priority flora or their buffers can be undertaken outside the area outlined in black in Figure 2 above.

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.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) 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 D) identified that the risk of impacts of the proposed clearing present a risk to biological values (fauna and flora) 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 (fauna) - Clearing Principles (a) and (b)

Assessment

Noting the habitat requirements, distribution of the recorded species and vegetation type and condition present within the application area, it was considered that the application area may comprise suitable habitat for the following state conservation significant fauna species recorded within the local area:

- *Egernia stokesii badia* (western spiny-tailed skink) (Vulnerable)
- *Idiosoma clypeatum* (northern shield-backed trapdoor spider) (Priority 3)

Furthermore, a fauna assessment (Umwelt, 2024) recorded two Southern Whiteface (*Aphelocephala leucopsis*) individuals within the application area. While not currently considered conservation significant by the state, southern whiteface is currently being considered to be included as Vulnerable under the BC Act and is listed as Vulnerable under the EPBC Act.

A consideration of impacts of the clearing to the above species is detailed below.

Western spiny-tailed skink

Two colour forms exist of the western spiny tailed skink. One (the 'brown form') is reddish-brown in colour, and occurs in open eucalypt woodlands and Acacia-dominated shrublands in semi-arid to arid areas of south-western WA (Geraldton Sandplains and Yalgoo IBRA) and, depending on taxonomic clarification, around Shark Bay including Peron Peninsula, Edel Land and Dirk Hartog Island (Geraldton Sandplain and Carnarvon IBRA) (DEC, 2012). The second, (the 'black form') occurs in an area approximately bounded by Yalgoo, Mt. Magnet, Cue and Murchison Settlements. It lives on granite outcrops and ironstone breakaways and shelters in horizontal crevices.

A fauna assessment within the application area (Umwelt, 2024) did not record evidence of western spiny tailed skink within the application area. Noting that the application area is within the range where the 'black form' of this species occurs, it is considered that habitat for this species within the application area would consist of granite outcrops and ironstone breakaways, and as this habitat type was not found within the application area, Umwelt (2024) considered that habitat for this species was not present. DBCA (2025) advised that the fauna assessment was not adequate to search for western spiny tailed skink and that a targeted survey for this species, including identifying key habitat values such as hollow logs, should be undertaken for this species. However, noting the search efforts detailed by Umwelt (2024) and that the black form of this species has only been found to inhabit granite outcrops and ironstone breakaways (and not hollow logs), it is considered that habitat for this species is unlikely to occur within the application area.

Trapdoor spider species

The northern shield-back trapdoor spider has a widespread distribution in Western Australia's inland arid zone, mainly throughout the Yalgoo and Murchison bioregions (DBCA, 2025). Habitat for this species is not well-defined, therefore it is not possible to rule out particular areas as unsuitable within the proposed area to be cleared. Recent survey work for *Idiosoma* species by DBCA and the WA Museum combined with genetic analysis of samples from the Thundelarra and Karara areas has identified new trapdoor spider species in the region (DBCA, 2025), and as such the application area may provide habitat for other trapdoor spider species. However, a targeted trapdoor spider survey (Invertebrate Solutions, 2025) did not record any trapdoor spider burrows within the application area. Noting this, the proposed clearing is considered unlikely to have a significant impact upon trapdoor spiders or their habitat.

Southern Whiteface

Two subspecies are recognised: *Aphelocephala leucopsis leucopsis* (south-east southern Whiteface), found throughout south-eastern and central Australia and *A. l. castaneiventris* (south-west southern whiteface) found in central and southern Western Australia (DBCA, 2025). Southern whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both (DCCEEW, 2023). These areas are

usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains (Higgins & Peter 2002).

A fauna assessment (Umwelt, 2024) recorded two southern whiteface individuals moving through the application area. Noting this, DBCA (2025) advised that due to the extent of the clearing in relation to surrounding vegetation and the species ability to move through the area, the impact of clearing on southern whiteface is likely to be negligible to minor, assuming nesting is not occurring at the time of clearing. Southern whiteface breeding takes place from July to October throughout most of the species' range, however, the timing of breeding is affected by rainfall in arid regions and birds may breed outside of their usual season following sufficient rainfall or may not breed at all during drought (DBCA, 2025). Noting the proposed clearing period for this application, it is considered possible that clearing would be undertaken during the southern whiteface breeding season.

The applicant (2025) provided the following further information in regard to the potential for southern whiteface within the application area:

- Umwelt (2024) did not observe any nests during their survey. Their track logs indicate they covered the area, and given the vegetation, areas of nesting would be visible at a distance.
- given the proximity to an airstrip that is in regular use, an accommodation facility that is in regular use, and the availability of extensive areas of vegetation in which there is no disturbance, the area does not constitute habitat that is considered to be suitable for breeding.
- Southern whiteface prefer to nest in hollows which are unlikely to be sizeable enough in the mulga vegetation recorded within the application area and are much more likely to be present in vegetation surrounding nearby watercourses, which contains much larger trees.

Noting the above, it is considered that the likelihood of southern whiteface nesting occurring in the application area is low. As such, with the inclusion of a condition requiring the permit holder to undertake slow, directional clearing, it is considered that southern whiteface individuals will be able to flee the application area during clearing and the clearing will be unlikely to harm individuals. Furthermore, it is considered that while the application area may provide foraging or transient habitat for this species, given the extent of the clearing in relation to similar remaining habitat within the local area, the clearing is unlikely to impact significant habitat for the southern whiteface.

Conclusion

Based on the above assessment, the proposed clearing will result in removal of habitat for southern whiteface, however, impacts are unlikely to be significant. For the reasons set out above, it is considered that the impacts of the proposed clearing on fauna can be managed by undertaking slow, directional clearing to allow fauna to move into adjacent vegetation.

Conditions

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

- Slow, directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity will minimise impact to fauna individuals.

3.2.2. Biological values (flora) - Clearing Principle (a)

Assessment

Noting the habitat requirements, distribution of the recorded species and vegetation type and condition present within the application area, it was considered that the application area may comprise suitable habitat for the following conservation significant flora species recorded within the local area:

- *Calandrinia butcherensis* (Priority 1)
- *Angianthus microcephalus* (Priority 2)
- *Eremophila simulans* subsp. *megacalyx* (Priority 3)

Noting the flora survey (Umwelt, 2024) did not record the above species and was considered to be an adequate survey for their identification, it is considered that these species are unlikely to occur within the application area. However, Umwelt (2024) did record the following conservation significant flora species within the application area:

- *Gunniopsis divisa* (Priority 3): three individuals at two locations
- *Hemigenia tysonii* (Priority 3): recorded at two locations (number of individuals not recorded)

Gunniopsis divisa is known from 28 records from Mouroubra in the south to East Murchison to the north in loam and quartz soils, often along roadsides (Western Australian Herbarium, 1998-). The individuals identified within the

application area do not represent a range extension for this species. *Hemigenia tysonii* is known from 23 records from South Murchison to Weld Range in the south to Kumarina in the north. The individuals identified within the application area do not represent a range extension for this species.

The applicant has committed to a condition on the permit prohibiting the clearing of *Gunniopsis divisa* and *Hemigenia tysonii* individuals, plus a 10 metre buffer around these individuals, within the red striped area on Figure 1 in Section 1.5, as this area is outside of the area in which clearing is required for the runway, and some discretion can be applied to this clearing. However, one location of *Gunniopsis divisa* (containing two individuals) and one location of *Hemigenia tysonii* (number of individuals not recorded) cannot be avoided for the runway expansion. Noting the number of records of each of these species and their distribution, it is considered that the proposed clearing is unlikely to impact upon the conservation status of these species.

Conclusion

Based on the above assessment, the proposed clearing will result in the clearing of Priority 3 *Gunniopsis divisa* and *Hemigenia tysonii* individuals, however, the proposed clearing is unlikely to impact upon the conservation status of these species.

It is considered that the impacts of the proposed clearing on *Gunniopsis divisa* and *Hemigenia tysonii* can be minimised through a flora management condition.

Conditions

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

- Clearing of identified individuals of *Gunniopsis divisa* and *Hemigenia tysonii*, and a 10-metre buffer surrounding these individuals, is prohibited in the area hatched red on Figure 1 of Schedule 1.

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

Assessment

The northern portion of the application area intercepts an area mapped as an inundation area of the seasonally flowing Roderick River. A flora and vegetation survey (Umwelt, 2024) considered that a portion of the vegetation within the application area, had slightly greater diversity, density and cover of mid and low shrubs and tussock grasses, reflecting slightly higher sheet flow and availability of surface water during heavy rainfall events, as water flows from the watercourse south of the application area, to Roderick River north of the application area, indicating the vegetation does have some association with these watercourses. Given the proposed clearing activities will not significantly change the extent of vegetation growing in association with this watercourse, as well as the seasonal nature of the watercourse, the clearing is considered unlikely to impact upon the water quality or ecology of this watercourse. Erosion management conditions described below will prevent erosion and any subsequent sedimentation occurring in these watercourses.

The mapped soils are susceptible to erosion. A condition requiring the permit holder to undertake the proposed development within three months of the clearing will limit the time in which bare soil is exposed to wind and water, preventing wind and water erosion from occurring.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to significantly impact ecological values or water quality within nearby watercourses and may result in some water and/or wind erosion, although impacts of this are unlikely to be significant subject to erosion management conditions.

Conditions

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

- The permit holder must commence activities related to the purpose of the clearing, no later than three (3) months after undertaking the authorised clearing activities to reduce the potential for erosion.

3.3. Relevant planning instruments and other matters

The proposed clearing area is located in the ex-pastoral Boolardy Station. A lease was granted by the Minister for Lands under the *Land Acquisition Act 1969* to CSIRO, with permitted uses that includes developing, operating, undertaking and decommissioning the SKA-1 Low project (AECOM, 2023).

The Shire of Murchison advised they are aware of the proposal and have no issue with the proposed native vegetation clearance (Shire of Murchison, 2025). The application area is zoned Pastoral and located within Special Control Atrea - Inner Zone - Australian Radio Quiet Zone under the Shire of Murchison Local Planning Scheme (DPLH, 2015). In this area, an application for planning approval is not required for radio-astronomy activities, including uses ancillary thereto (DPLH, 2015).

The north-eastern portion of the application area overlaps an area classified as 'Possibly contaminated - investigation required' under the *Contaminated Sites Act 2003* due to historical hydrocarbon spills. The applicant has been advised to contact DWER's Contaminated Sites branch regarding this classification.

End

Appendix A. Additional information provided by applicant

The applicant provided the following additional information following the departments acceptance of the application.

Summary of comments	Consideration of comment
Further considerations regarding necessity of clearing and detailed design drawings of runway upgrades (CSIRO, 2024b)	Considered in Section 3.1
Information regarding southern whiteface within the application area (CSIRO, 2025)	Considered in Section 3.2.1
Targeted Assessment for <i>Idiosoma</i> sp. for the Boolardy Airfield Upgrade (Invertebrate Solutions, 2025)	Considered in Section 3.2.1

Appendix B. Details of public submissions

One submission was received regarding this application (Submission, 2024). The issues raised in this submission are detailed below.

Summary of comments	Consideration of comment
No explanation is given as to why the existing airstrip is inadequate to cater for the increased flights needed to support the SKA project. What are the reasons and could other solutions be found?	Considered in Section 3.1
CSIRO state that the clearing extent has been determined based on a preliminary concept design and that refinement of the clearing requirements will be undertaken as the detailed design phases progresses. This could possibly lead to unnecessary clearing.	Considered in Section 3.1

Appendix C. Site characteristics

C.1. Site characteristics

Characteristic	Details
Local context	<p>The application area is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia, although the application area and vegetation in its vicinity does contain small areas of clearing for roads and an airstrip. It is surrounded by native vegetation.</p> <p>Aerial imagery indicates the local area (20-kilometre radius from the centre of the area proposed to be cleared) retains close to 100 per cent of the original native vegetation cover.</p>
Ecological linkage	No formal ecological linkages are mapped in the vicinity of the application area and noting the area is almost entirely vegetated, ecological linkages are not particularly applicable in this area.
Conservation areas	No formally reserved conservation areas are present within the local area (20 kilometre radius) of the application area.
Vegetation description	A vegetation survey (Umwelt, 2024) indicates the vegetation within the proposed clearing area consists of:

Characteristic	Details
	<ul style="list-style-type: none"> 44.19 hectares - Low open woodland to isolated trees of <i>Acacia pteraneura</i> and occasionally <i>Acacia caesaneura</i> (narrow phyllode variant), <i>Acacia incurvaneura</i> and <i>Acacia craspedocarpa</i>, over occasional tall sparse shrubland of mixed species including <i>Acacia tetragonophylla</i>, <i>Acacia ramulosa</i> var. <i>linophylla</i> and <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i>, over mid open to sparse shrubland of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> and occasionally <i>Eremophila galeata</i> and <i>Acacia kempeana</i>, over low isolated shrubs of mixed species including <i>Solanum lasiophyllum</i>, <i>Senna artemisioides</i> subsp. <i>helmsii</i>, <i>Senna</i> sp. Meekatharra (E. Bailey 1-26), <i>Ptilotus obovatus</i> var. <i>obovatus</i> and <i>Eremophila spuria</i>, over occasional low isolated chenopod shrubs of mixed species including <i>Sclerolaena densiflora</i>, <i>Salsola australis</i>, <i>Maireana villosa</i> and <i>Sclerolaena gardneri</i>, over low isolated clumps of tussock grasses of mixed species including <i>Aristida contorta</i> and <i>Monachather paradoxus</i>, on red-brown sandy clay loam or clay loam on flat plains 17.54 hectares - cleared <p>Representative photos and maps are available in Appendix F.</p> <p>This is consistent mapped vegetation type:</p> <ul style="list-style-type: none"> Beard 29, which is described as sparse low woodland; mulga, discontinuous in scattered groups (Shepherd et al, 2001) <p>The mapped vegetation type retains approximately 99.9 per cent of the original extent (Government of Western Australia, 2019a).</p>
Vegetation condition	<p>A vegetation survey (Umwelt, 2024) indicates the vegetation (other than cleared areas) within the proposed clearing area is in Very Good to Poor (Trudgen, 1991) condition, described as:</p> <ul style="list-style-type: none"> 34.72 hectares - 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. 7.74 hectares - 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. 1.73 hectares - 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. <p>The full Trudgen (1991) condition rating scale is provided in Appendix E. Representative photos and mapping are available in Appendix F.</p>
Climate	<p>The Murchison region is characterised by an arid climate with bimodal rainfall (summer and winter) and an annual precipitation around 200 millimetres (mm) (Beard, 2015). The region experiences a large variation in monthly precipitation from year to year, correlating to the climatic conditions of that particular year, with influences from both remnants of cyclonic/tropical low activity extending from the Pilbara and Kimberley Region (typical from December to March), and winter precipitation extending inland from the southern coastal regions (typical from June to August).</p>
Topography	<p>Contour information suggests the application area is relatively flat, with an elevation of approximately 320 m AHD.</p>
Soil description	<p>The soil is mapped as Yanganoo system (272Yg), described as almost flat hardpan wash plains, with or without small wanderrie banks and weak grooving; supporting mulga shrublands and wanderrie grasses on banks.</p>

Characteristic	Details
Land degradation risk	The Yanganoo land system is susceptible to accelerated erosion when severely degraded, but much more susceptible to degradation and water starvation arising from inappropriately maintained roads and tracks (Curry et. al. 1994).
Waterbodies	The northern portion of the application area intercepts an area mapped as an inundation area of the seasonally flowing Roderick River. The Roderick River channel is located approximately 250 m north of the application area and tributaries of this River are mapped 950 m southwest of the application area.
Hydrogeography	<p>The application area is within the Gascoyne Groundwater Area proclaimed under the RIWI Act.</p> <p>The Roderick, Murchison and Sanford Rivers and Elgalgera/Gordon Creek have been mapped from a national assessment as high to moderate potential terrestrial groundwater dependent ecosystems (GDEs), with associated floodplains and hardpan wash plain areas (including the application area) being mapped as low potential terrestrial GDEs (meaning the ecosystem is considered to have a low potential of being groundwater dependent).</p> <p>Hydrogeology: Surficial Sediments - Shallow Aquifers (Surficial sediments lithology)</p> <p>Groundwater salinity: 1000-3000 mg/L TDS (brackish/moderately saline)</p>
Flora	<p>There are records of 3 Priority flora species within the local area (20 kilometre radius from the application area), two of which are found on the same soil and vegetation type as the application area (Western Australian Herbarium, 1998-). The closest of these to the application area is Priority 2 species <i>Angianthus microcephalus</i> approximately 185 metres northwest of the application area.</p> <p>A flora survey (Umwelt, 2024) recorded the following conservation significant flora species within the application area:</p> <ul style="list-style-type: none"> • <i>Gunniopsis divisa</i> (Priority 3): three individuals at two locations • <i>Hemigenia tysonii</i> (Priority 3): recorded at two locations (number of individuals not recorded)
Ecological communities	No conservation significant ecological communities have been recorded within the local area, nor were found in the flora and vegetation survey (Umwelt, 2024).
Fauna	<p>One Threatened fauna species and one Priority fauna species have been recorded within the local area, the closest record of which to the application area is threatened species <i>Egernia stokesii badia</i> (western spiny-tailed skink) approximately 280 metres east of the application area. However, this record is noted to have an accuracy of 10 km, and the location description states that it occurs at the CSIRO Murchison Radio-astronomy Observatory (approximately 30 km north-northeast of the Survey Area) (DBCA, 2023d); therefore, the coordinates of this record are considered to be erroneous, with the actual location likely occurring further northeast.</p> <p>A basic fauna assessment (Umwelt, 2024) did not record any state Threatened or Priority fauna within the application area. However, two Southern Whiteface (<i>Aphelocephala leucopsis</i>) individuals were recorded within the application area by Umwelt (2024). Southern whiteface are listed as Vulnerable under the EPBC Act and the species is currently being considered to be included as Vulnerable under the BC Act.</p> <p>A targeted survey for <i>Idiosoma</i> species (Invertebrate Solutions, 2025), did not record any active or inactive burrows of <i>Idiosoma</i> species within the application area.</p>

C.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*					
Murchison	28,120,586.77	28,044,823.42	99.73	2,185,987.96	7.77
Vegetation complex					
Beard vegetation association 29 *	7,903,991.45	7,898,973.24	99.94	496,367.56	6.28
Beard vegetation association 29 * in Murchison region	2,956,382.06	2,955,695.34	99.98	93,019.80	3.15

*Government of Western Australia (2019a)

C.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix G.1), and biological survey information (Umwelt, 2024), 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 Florabase records	Number of records in local area	Are surveys adequate to identify? [Y, N, N/A]
<i>Calandrinia butcherensis</i>	P1	Y	Y	Y	15.8	12	1	Y
<i>Angianthus microcephalus</i>	P2	Y	Y	N	0.2	17	1	Y
<i>Eremophila simulans</i> subsp. <i>megacalyx</i>	P3	Y	Y	Y	0.7	11	3	Y

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

C.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix G.1), and biological survey information (Umwelt, 2024), 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 records in local area	Are surveys adequate to identify? [Y, N, N/A]
<i>Egernia stokesii badia</i> (western spiny-tailed skink)	VU	N	Y	0.3 (likely erroneous) then 18.5	2	Y
<i>Idiosoma clypeatum</i> (northern shield-backed trapdoor spider)	P3	Y	Y	16.2	3	N

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

Appendix D. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<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> The area proposed to be cleared contains conservation significant flora and habitat for southern whiteface.</p>	May be at variance	Yes <i>Refer to Sections 3.2.1 and 3.2.2 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> The application area contains habitat for southern whiteface, however, this habitat is widespread. The application area is not likely to provide significant habitat for this species, with breeding habitat for southern whiteface unlikely to be present.</p>	At variance	Yes <i>Refer to Section 3.2.1 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> The area proposed to be cleared is unlikely to contain threatened flora species listed under the BC Act.</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> The area proposed to be cleared does not contain species indicative of a threatened ecological community.</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 extents of the mapped vegetation type and native vegetation in the local area are 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.</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> Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of conservation areas.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <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> The application area is mapped within as an inundation area of the seasonally flowing Roderick River. Vegetation is considered to be growing in association with this watercourse.</p>	At variance	Yes <i>Refer to Section 3.2.3 above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (g):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</p> <p><u>Assessment:</u></p> <p>The mapped soils are susceptible to erosion. An erosion management condition is expected to mitigate impacts of the clearing to soils from erosion.</p>	May be at variance	Yes <i>Refer to Section 3.2.3 above.</i>
<p><u>Principle (i):</u> “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.”</p> <p><u>Assessment:</u> Although the northern portion of the application area is within an inundation area of the Roderick River, noting the seasonally flowing nature of this watercourse and that the proposed clearing activities will not significantly change the extent of vegetation growing in association with this watercourse, the clearing is considered unlikely to impact upon surface water quality. Erosion management measures conditioned on the permit will reduce the risk of impacts to surface water quality.</p> <p>Noting that no Public Drinking Water Sources Areas are recorded within 20 kilometres of the application area and the nature of the vegetation present, the proposed clearing is unlikely to significantly impact groundwater quality.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.3 above.</i>
<p><u>Principle (j):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment:</u></p> <p>Noting the topographic contours and vegetation remaining in the surrounding area, the proposed clearing is considered unlikely to contribute to increased incidence or intensity of flooding.</p> <p>Given the proposed end land use and that the applicant plans to manage drainage as part of this development, the proposed clearing is unlikely to contribute to waterlogging.</p>	Not likely to be at variance	No

Appendix E. 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 (1991).

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.

Condition	Description
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 F. Biological survey information excerpts and photographs of the vegetation

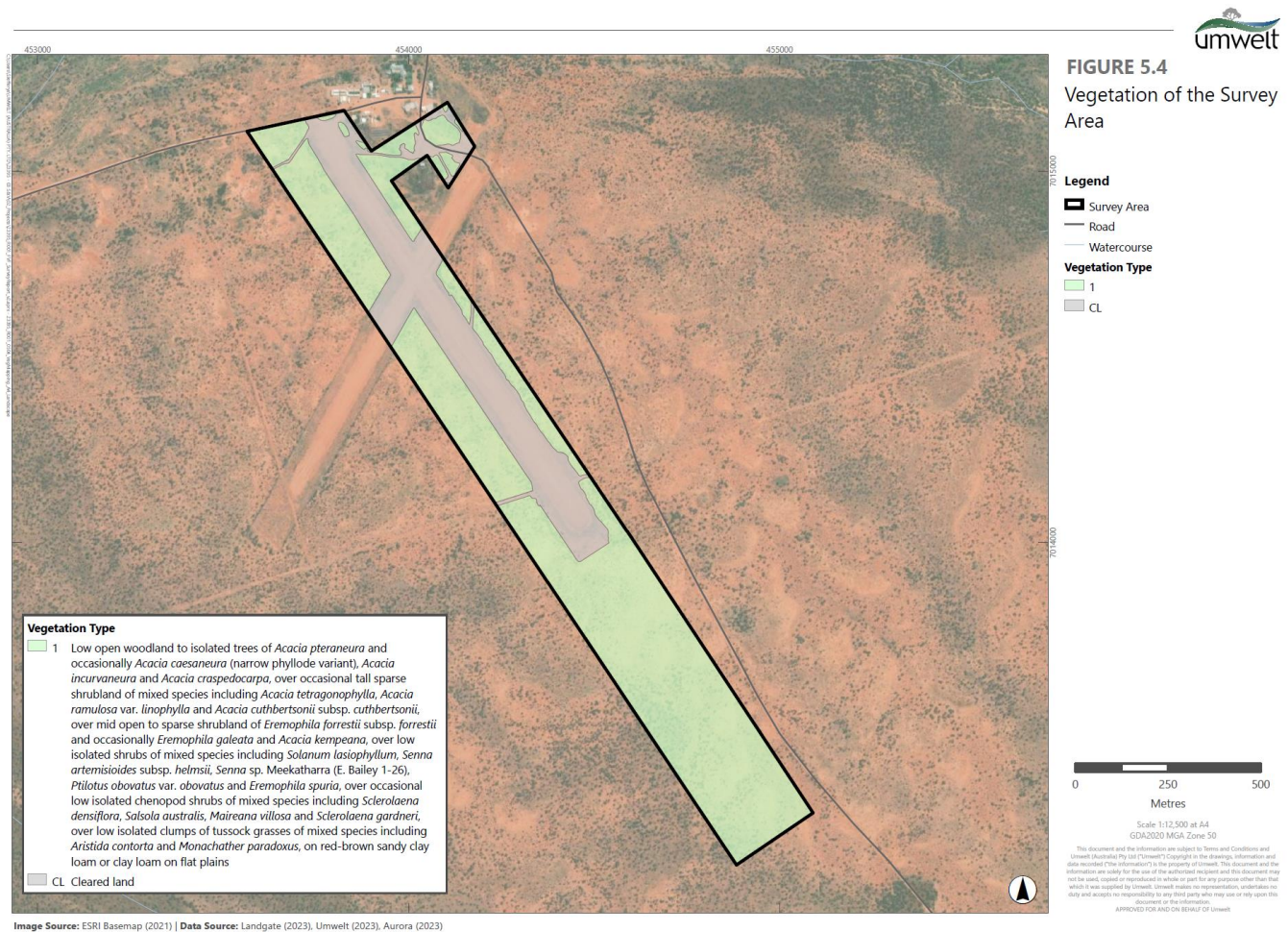


Figure F-1. Vegetation types mapped within application area (Umwelt, 2024)

FIGURE 5.5

Vegetation Condition of the Survey Area

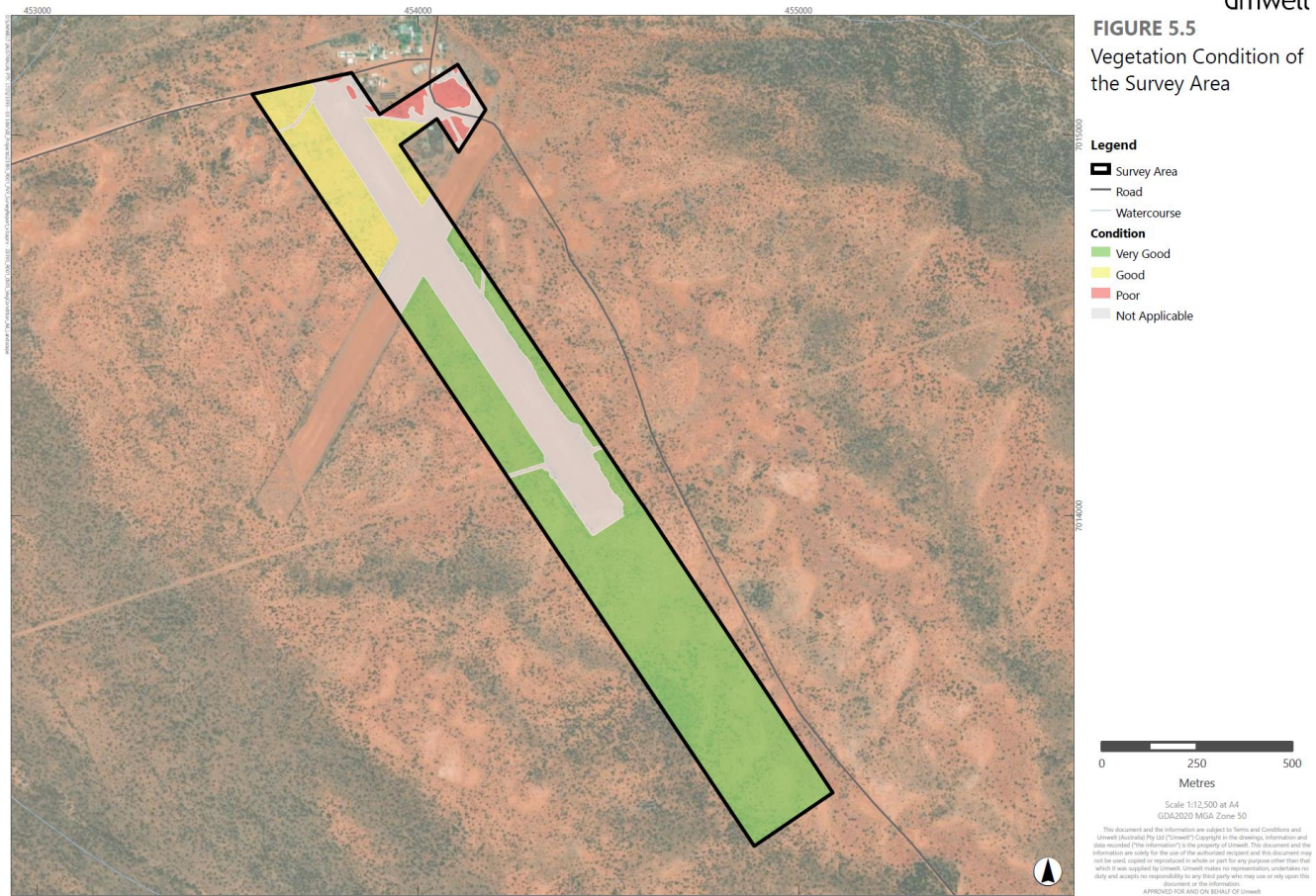


Image Source: ESRI Basemap (2021) | Data Source: Landgate (2023), Umwelt (2023), Aurora (2023)

Figure F-2. Vegetation condition mapped within application area (Umwelt, 2024)**Figure F-3.** Photograph of vegetation within application area (Umwelt, 2024)



Figure F-4. Photograph of vegetation within application area (Umwelt, 2024)



Figure F-5. Photograph of vegetation within application area (Umwelt, 2024)



Figure F-6. Photograph of vegetation within application area (Umwelt, 2024)



Figure F-7. Photograph of vegetation within application area (Umwelt, 2024)



Figure F-8. Photograph of vegetation within application area (Umwelt, 2024)



Figure F-9. Photograph of vegetation within application area (Umwelt, 2024)

Appendix G. Sources of information

G.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)
- 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 Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- 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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