



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 6110/6
Permit Holder:	Pilbara Iron Company (Services) Pty Ltd
Duration of Permit:	4 October 2014 to 31 December 2024

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

- Clearing within the areas cross-hatched yellow in Figures 1-14 of Schedule 1, for the purpose of constructing town and camp infrastructure and associated works; and
- Clearing within the areas cross-hatched red in Figure 14 of Schedule 1 for the purposes of maintaining roads and access tracks, undertaking works associated with the monitoring bore network, and maintaining power infrastructure.

2. Land on which clearing is to be done

Clearing authorised under this Permit is to be undertaken within land tenure or rights administered under the *Mining Act 1904 (WA)*, *Mining Act 1978 (WA)*, *Land Act 1933 (WA)*, *Land Administration Act 1997 (WA)*, *Property Law Act 1969 (WA)*, *Transfer of Land Act 1893 (WA)*, *Strata Titles Act 1985 (WA)*, the *Rights in Water and Irrigation Act 1914 (WA)*, the *Water Corporation Act 1995 (WA)*, the *Water Agencies (Powers) Act 1984 (WA)* and the following State Agreement Acts –

- *Iron Ore (Hamersley Range) Agreement Act 1963*
 - *Iron Ore (Robe River) Agreement Act 1964*
 - *Iron Ore (Hamersley Range) Agreement Act 1968 (Paraburdoo)*
 - *Iron Ore (Mount Bruce) Agreement Act 1972*
 - *Iron Ore (Channar Joint Venture) Agreement Act 1987*
 - *Iron Ore (Hope Downs) Agreement Act 1992*
 - *Iron Ore (Yandicoogina) Agreement Act 1996*
- Karijini Drive Road reserve (Lot 106 on Plan 218877)

3. Area of Clearing

The Permit Holder must not clear more than 75.3 hectares of native vegetation within the areas cross-hatched yellow in Figures 1-14 of Schedule 1.

4. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

PART II – MANAGEMENT CONDITIONS

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

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

- avoid the clearing of native vegetation;
- minimise the amount of native vegetation to be cleared; and
- reduce the impact of clearing on any environmental value.

6. Weed control

When undertaking any clearing or other activity pursuant to this Permit, the Permit Holder must take the following steps to minimise the risk of the 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 *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 conduct clearing activities in a slow, progressive manner in one direction, to allow fauna to move into adjacent native vegetation ahead of the clearing activity.

8. Flora management

- (a) Prior to undertaking any clearing authorised under this Permit, the Permit Holder must engage a *botanist* to undertake a *targeted flora survey* of the area(s) to be cleared in accordance with *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* to identify possible occurrences of, and habitat suitable for, *threatened flora* listed under the *Biodiversity Conservation Act 2016* and *priority flora*.
- (b) Prior to undertaking any clearing authorised under this Permit, where an area has been identified in accordance with condition 8(a) as containing possible occurrences of, and habitat suitable for, *threatened flora* or *priority flora*, the Permit Holder shall engage a *botanist* to inspect that area for the presence of *threatened flora* and *priority flora*.
- (c) Where *threatened flora* or *priority flora* are identified in relation to condition 8(b) of this Permit, the Permit Holder shall ensure that:
 - (i) no clearing occurs within 50 metres of identified *threatened flora* or priority 1 flora, unless approved by the *CEO* in writing;
 - (ii) no clearing of identified *threatened flora* occurs unless approved under section 40 of the *Biodiversity Conservation Act 2016*;
 - (iii) no clearing occurs within 20 metres of identified priority 2, 3 and 4 flora, unless approved by the *CEO* in writing; and
 - (iv) no clearing of identified *priority flora* occurs unless approved by the *CEO* in writing.
- (d) Prior to undertaking any clearing authorised under this Permit, the Permit Holder must provide the results of the *targeted flora survey* in a report to the *CEO*.
- (e) If any *threatened flora* or *priority flora* are identified in relation to condition 8(b), the *targeted flora survey* report must include the following:
 - (i) the location of each *threatened flora* and *priority flora*, identified under conditions 8(a) or 8(b), either as the location of individual plants, or where this is not practical, the areal extent of the population and an estimate of the number of plants, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the species name of each *threatened flora* and *priority flora* species identified under conditions 8(a) or 8(b); and
 - (iii) the methodology used to survey the permit area.

9. Fauna management

- (a) Prior to undertaking any clearing authorised under this Permit, the Permit Holder shall engage a *fauna specialist* to undertake a *desktop study* of the area(s) to be cleared, to identify areas of habitat on which fauna listed in the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* have a specific dependence.
- (b) Prior to undertaking any clearing authorised under this Permit, where habitat areas are identified in accordance with condition 9(a), the Permit Holder shall engage a *fauna specialist* to undertake a *fauna survey* of the area(s) to be cleared, in accordance with *Technical Guidance – Terrestrial Fauna Surveys*.
- (c) Prior to undertaking any clearing, the Permit Holder shall provide the results of the *fauna survey* in a report to the *CEO*.

- (d) The *fauna survey* report must include the following:
 - (i) the findings of the *desktop study* undertaken in accordance with condition 9(a);
 - (ii) the location of the areas of habitat on which fauna have a specific dependence recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iii) the location of any fauna species, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iv) the name of each fauna species identified;
 - (v) the methodology, used to survey the Permit Area and to establish the areas of habitat on which fauna have a specific dependence;
 - (vi) the extent of the areas of habitat on which fauna have a specific dependence of the identified fauna shown on a map; and
 - (vii) a description of the areas of habitat on which fauna have a specific dependence of fauna found.
- (e) Prior to undertaking clearing authorised under this Permit, where areas are identified in accordance with condition 9(a), the Permit Holder must:
 - (i) avoid areas identified in accordance with condition 9(a); or
 - (ii) where the areas identified in accordance with condition 9(a) cannot be avoided, prepare, implement and adhere to a *Fauna Management Plan*, designed by a *fauna specialist*.
- (f) Prior to undertaking any clearing authorised under this Permit, where fauna is identified in accordance with condition 9(b), the Permit Holder must prepare, implement and adhere to a *Fauna Management Plan*, designed by a *fauna specialist*.
- (g) The *Fauna Management Plan* must include the following:
 - (i) a plan for managing the *impacts*;
 - (ii) a plan for managing any fauna identified in accordance with condition 9(b);
 - (iii) a table setting out the Permit Holder's commitments to the *Fauna Management Plan* requirements; and
 - (iv) a program for monitoring compliance with the Permit Holder's commitments.
- (h) Once the Permit Holder has developed a *Fauna Management Plan*, the Permit Holder must provide that *Fauna Management Plan* to the *CEO* for the *CEO*'s approval. The clearing to which the *Fauna Management Plan* relates, and the implementation of the *Fauna Management Plan* shall not take place until the Permit Holder receives approval from the *CEO*.
- (i) If it is necessary to modify the *Fauna Management Plan* approved by the *CEO*, then the Permit Holder must provide that modified *Fauna Management Plan* to the *CEO* for the *CEO*'s approval. The Permit Holder shall not implement the modified *Fauna Management Plan* until approval is received from the *CEO*.

10. Vegetation management

- (a) Where practicable the Permit Holder shall avoid clearing riparian vegetation.
- (b) Where a watercourse or wetland is to be impacted by clearing, the Permit Holder shall maintain the existing surface flow by use of culverts.

PART III – MONITORING, RECORD KEEPING AND REPORTING

11. Records to be kept

The Permit Holder must maintain the following records for activities done pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
 - (i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the date that the area was cleared;
 - (iii) the size of the area cleared (in hectares);
 - (iv) the actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 5; and
 - (v) the actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with condition 6.

- (b) In relation to flora management pursuant to condition 7 of this Permit:
 - (i) the name and location of each *threatened flora* and/or *priority flora* species recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) actions taken to demarcate each *threatened flora* and/or *priority flora* species recorded and their relevant *buffers*; and
 - (iii) actions taken to avoid the clearing of *threatened flora* and/or *priority flora* species and their relevant *buffers*.
- (c) In relation to fauna management pursuant to condition 8 of this Permit:
 - (i) the location of areas of habitat on which fauna have a specific dependence recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the name and location of any fauna species recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (iii) actions taken to demarcate and avoid each area of habitat on which fauna have a specific dependence recorded; and
 - ~~(iv)~~ a description and results of the fauna management activities undertaken in accordance with the *Fauna Management Plan* approved by the *CEO*.
- (d) In relation to vegetation management pursuant to condition 9 of this Permit:
 - (i) actions taken to avoid riparian vegetation; and
 - (ii) evidence of the installation of culverts to maintain existing flow.

11. Reporting

- (a) The Permit Holder must provide to the *CEO* on or before 30 June of each year, a written report:
 - (i) of records required under condition 10 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this Permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 31 December of each year.
- (c) Prior to 30 June 2024, the Permit Holder must provide to the *CEO* a written report of records required under condition 10 of this Permit where these records have not already been provided under condition 11(a) of this Permit.

DEFINITIONS

The following meanings are given to terms used in this Permit:

botanist: means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of two (2) years' work experience in Western Australian flora identification and undertaking surveys of flora native to the bioregion being inspected or surveyed, or who is approved by the *CEO* as a suitable botanist for the bioregion, and who holds a valid flora licence issued under the *Biodiversity Conservation Act 2016*;

buffer/s means 50 metres for *threatened flora*, and 20 metres for *priority flora*;

CEO means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

critical habitat means any part of the Permit Area comprising of the habitat of flora or fauna species and its population, that is critical for the health and long-term survival of the flora or fauna species and its population;

desktop study means a process of gathering contextual information on the area(s) to be cleared from existing surveys, literature, databases searches and spatial information undertaken by *fauna specialist* in accordance with *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*, Environmental Protection Authority, July 2020;

environmental specialist means a person who holds a tertiary qualification in environmental science or equivalent, and has a minimum of two (2) years' work experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the CEO as a suitable environmental specialist;

fauna management plan means a plan developed by the Permit Holder for the management of fauna at the site in accordance with condition 7 of this Permit;

fauna specialist: means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of two (2) years' work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the CEO as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the *Biodiversity Conservation Act 2016*;

fauna survey means a field-based investigation, including a review of established literature, of the biodiversity of fauna and/or fauna habitat of the permit area and where conservation significant fauna are identified in the permit area, also includes a fauna survey of surrounding areas to place the permit area into local context;

fill means material used to increase the ground level, or fill a hollow;

impacts means any impact of clearing on environmental values;

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;

priority flora means those plant taxa described as priority flora classes 1, 2, 3, or 4 in the *Department of Biodiversity, Conservation and Attractions Threatened and Priority Flora List for Western Australia* (as amended);

targeted flora survey means a field-based investigation, including a review of established literature, of the biodiversity of flora and vegetation of the permit area, focusing on habitat suitable for flora species that are being targeted and carried out during the optimal time to identify those species. Where target flora are identified in the permit area, the survey must also include a minimum of a 10 metre radius of the surrounding areas to place the permit area into local context;

Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment – means *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, Environmental Protection Authority, December 2016;

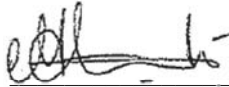
Technical Guidance – Terrestrial Fauna Surveys - means *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*, Environmental Protection Authority, July 2020;

threatened flora means those plant taxa listed as threatened flora under the *Biodiversity Conservation Act 2016*;

Wildlife Conservation (Specially Protected Fauna) Notice 2018 means those fauna taxa gazetted as threatened fauna pursuant to section 19(1) of the *Biodiversity Conservation Act 2016*; and

weed/s 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.



Meenu Vitarana

A/MANAGER

NATIVE VEGETATION REGULATION

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

19 October 2021

Schedule 1

The boundary of the areas authorised to be cleared is shown in Figures 1-14 below.

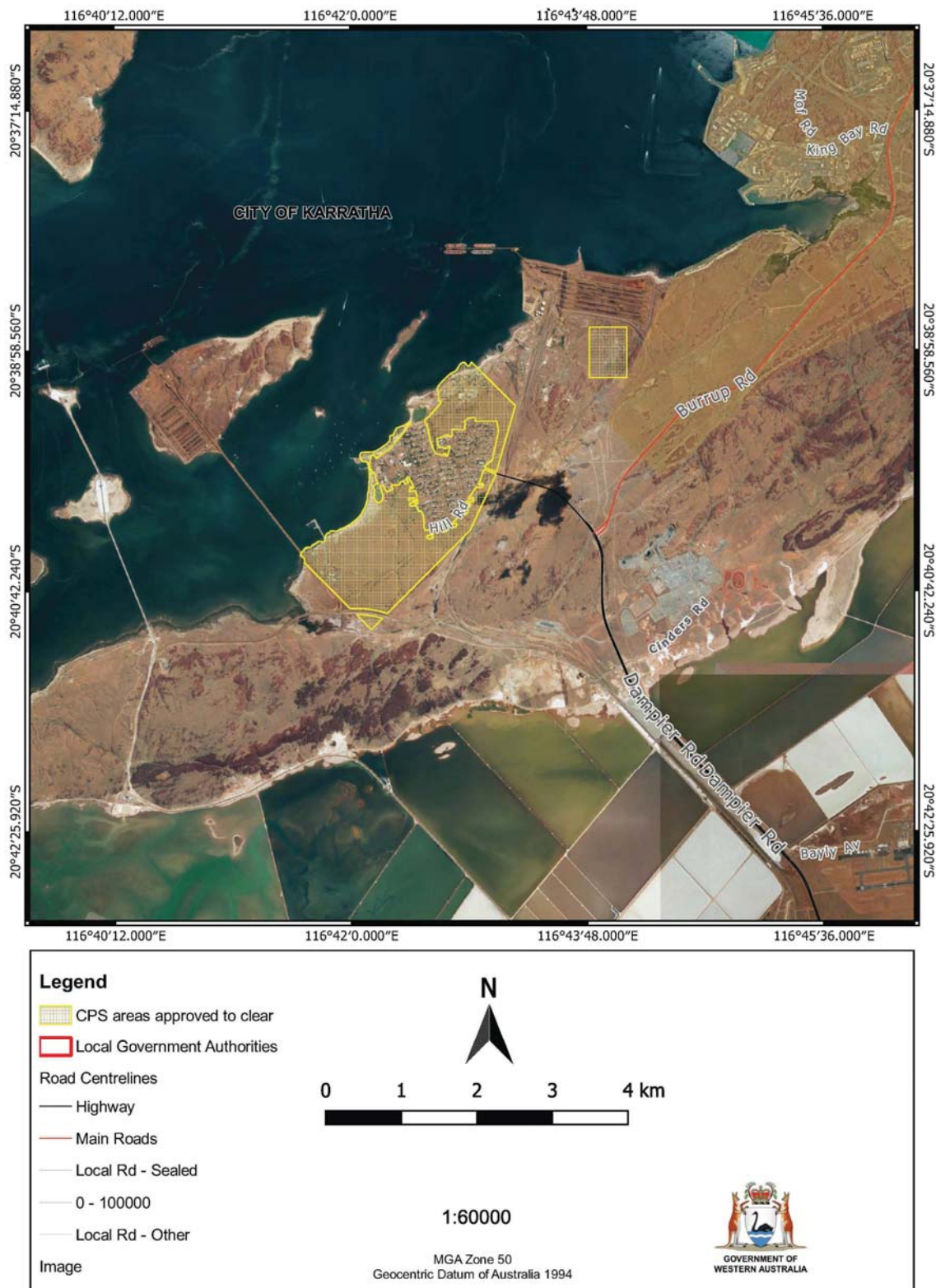


Figure 1: Map of the boundary of the areas within which clearing may occur

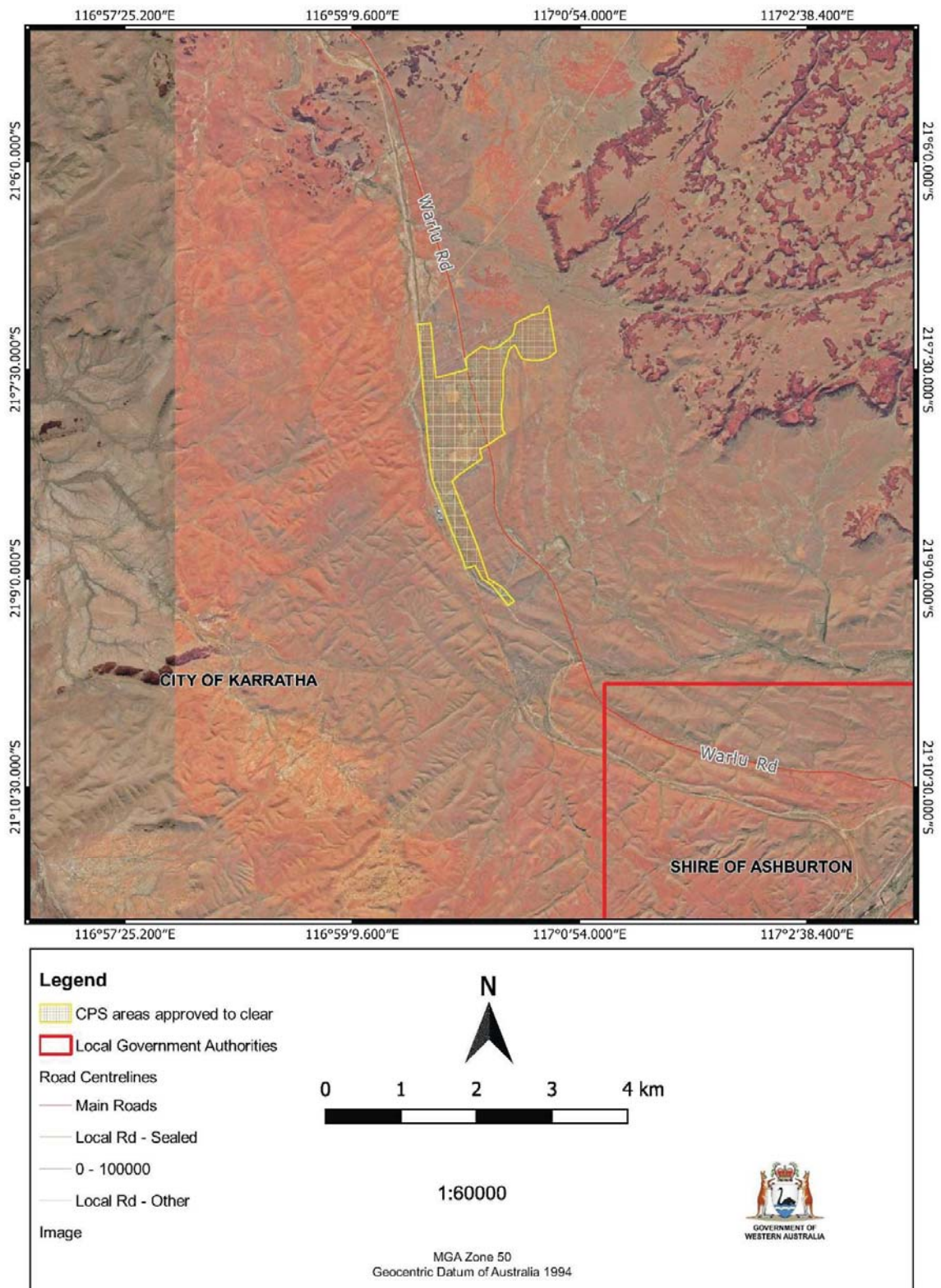


Figure 2: Map of the boundary of the areas within which clearing may occur

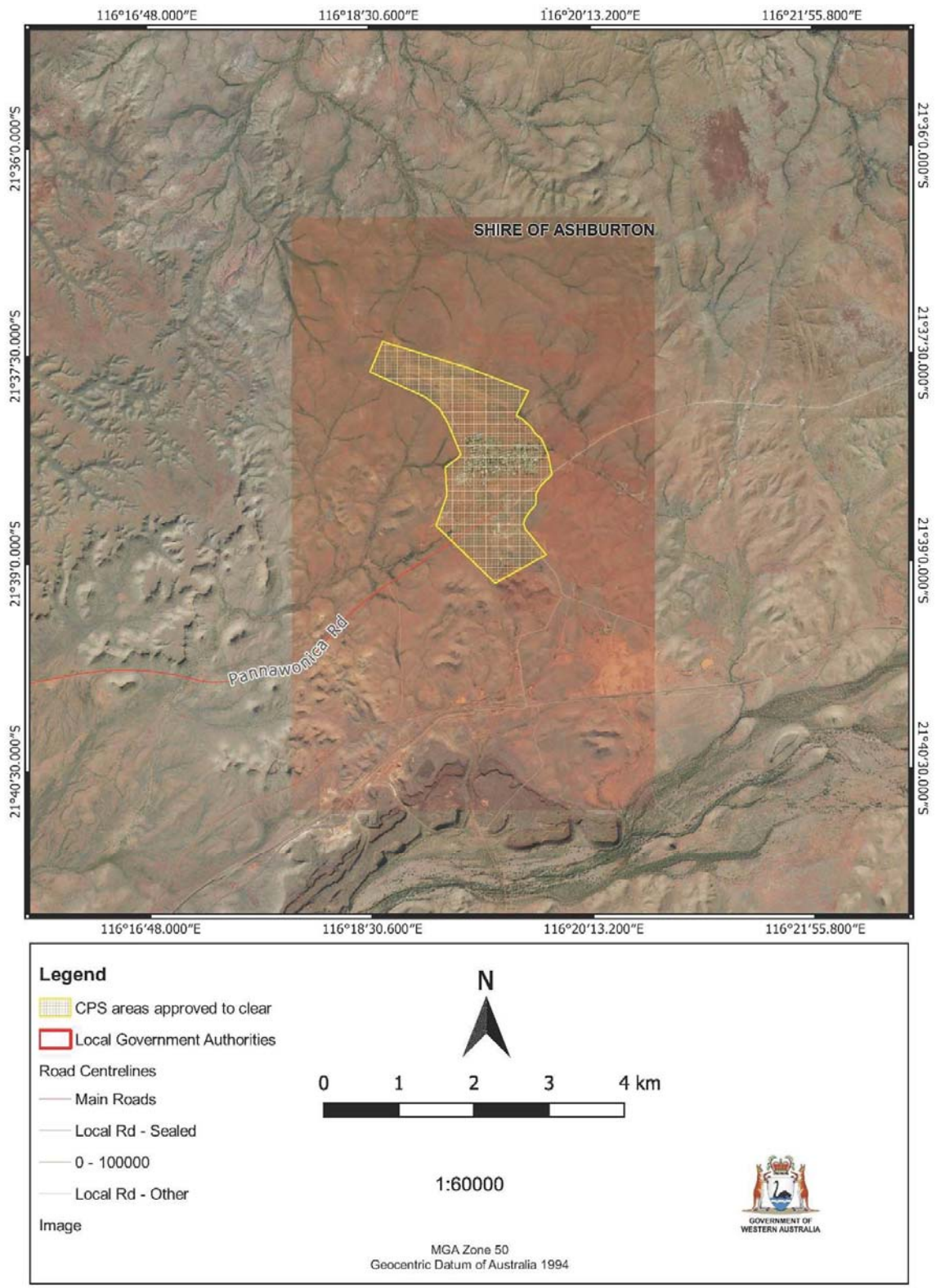


Figure 3: Map of the boundary of the areas within which clearing may occur

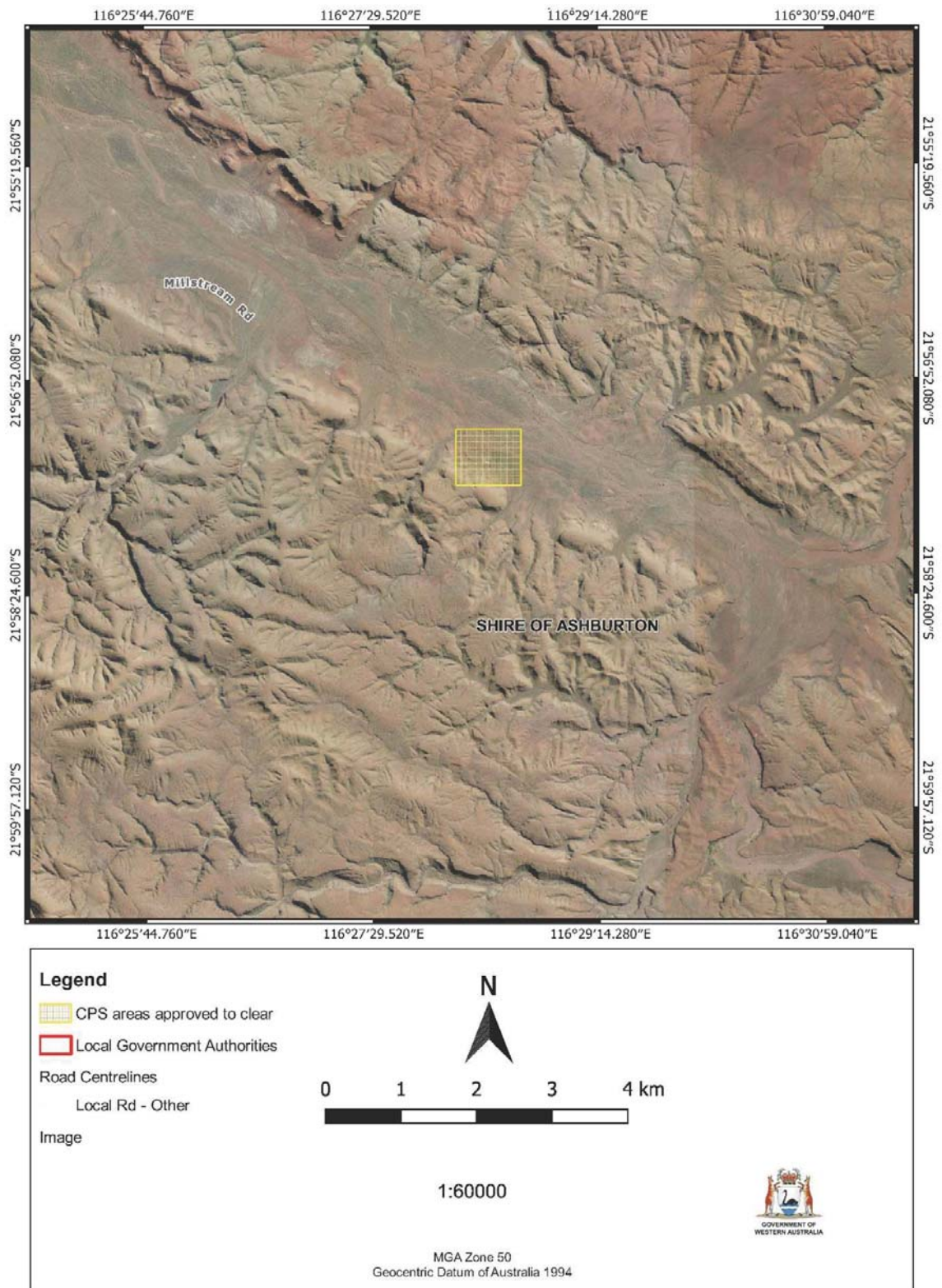


Figure 4: Map of the boundary of the areas within which clearing may occur

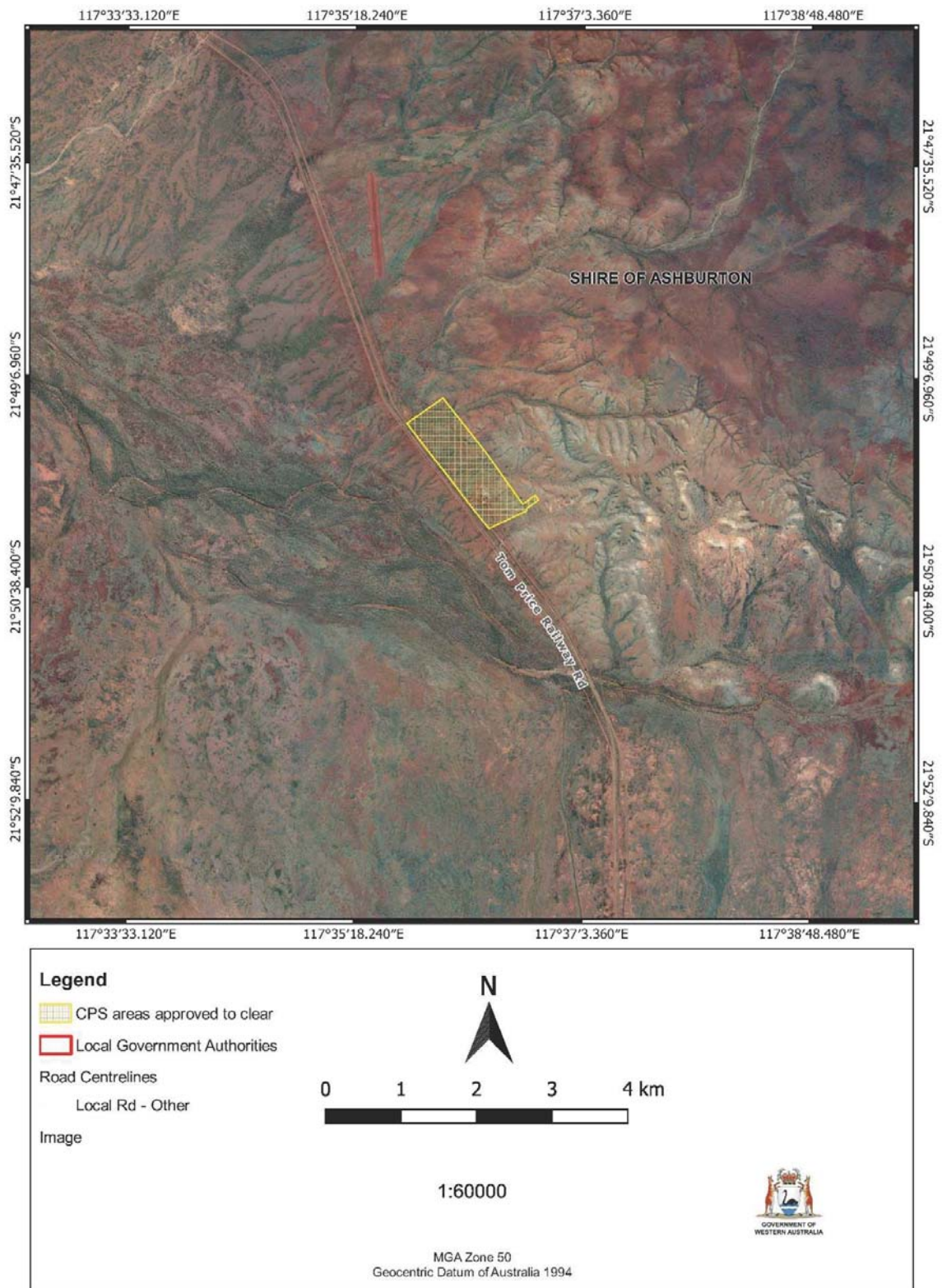


Figure 5: Map of the boundary of the areas within which clearing may occur

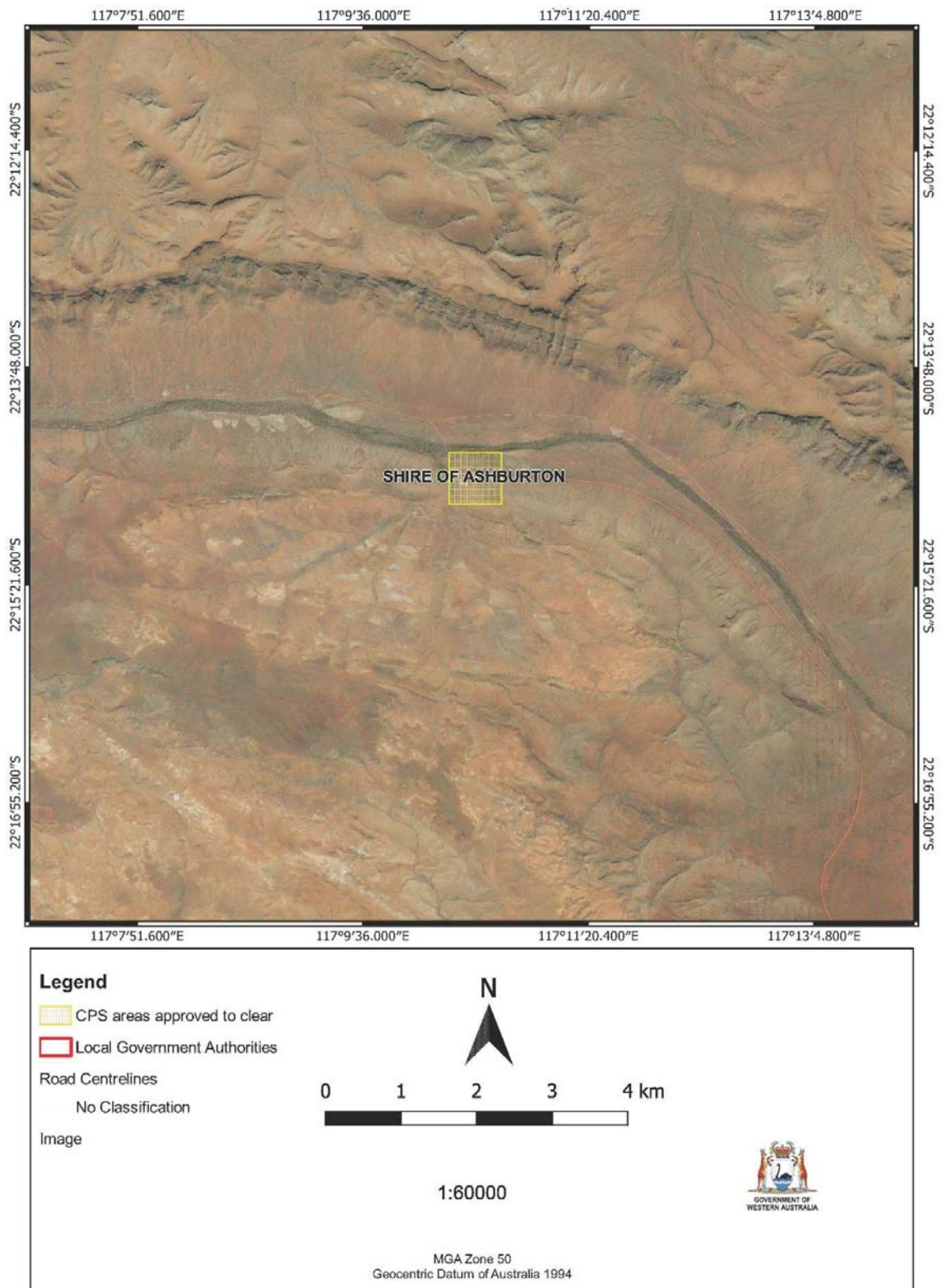


Figure 6: Map of the boundary of the areas within which clearing may occur

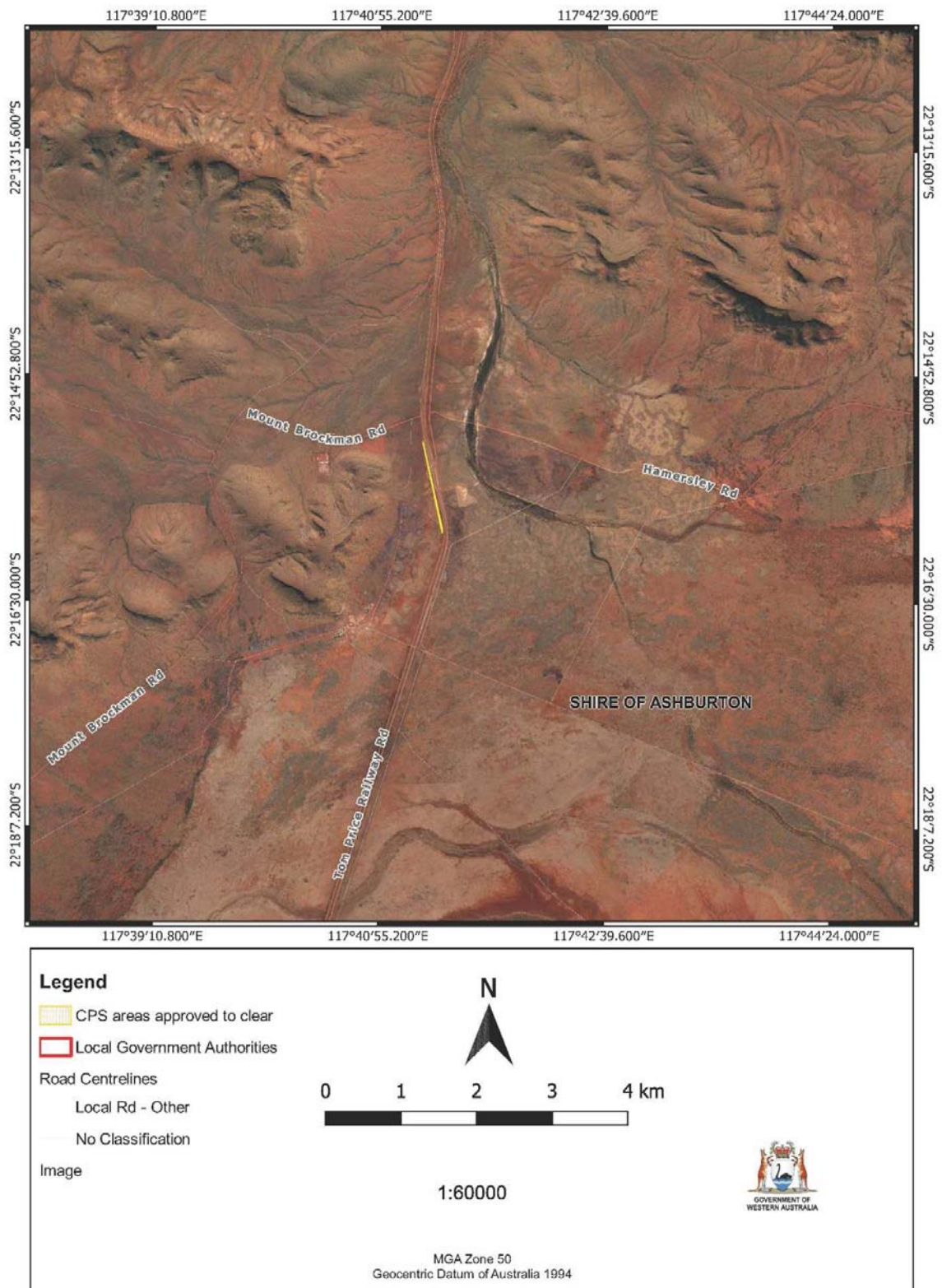


Figure 7: Map of the boundary of the areas within which clearing may occur

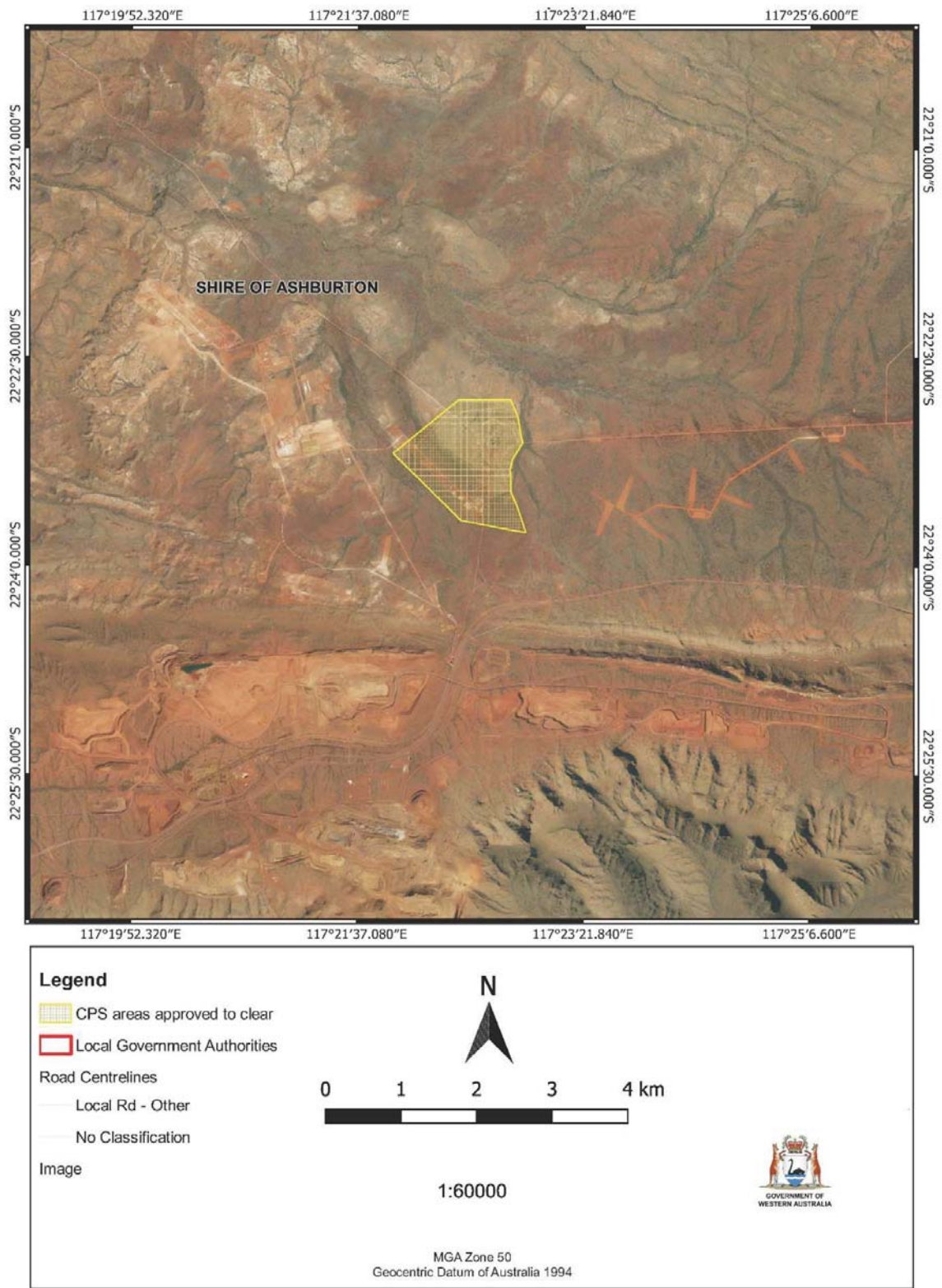


Figure 8: Map of the boundary of the areas within which clearing may occur

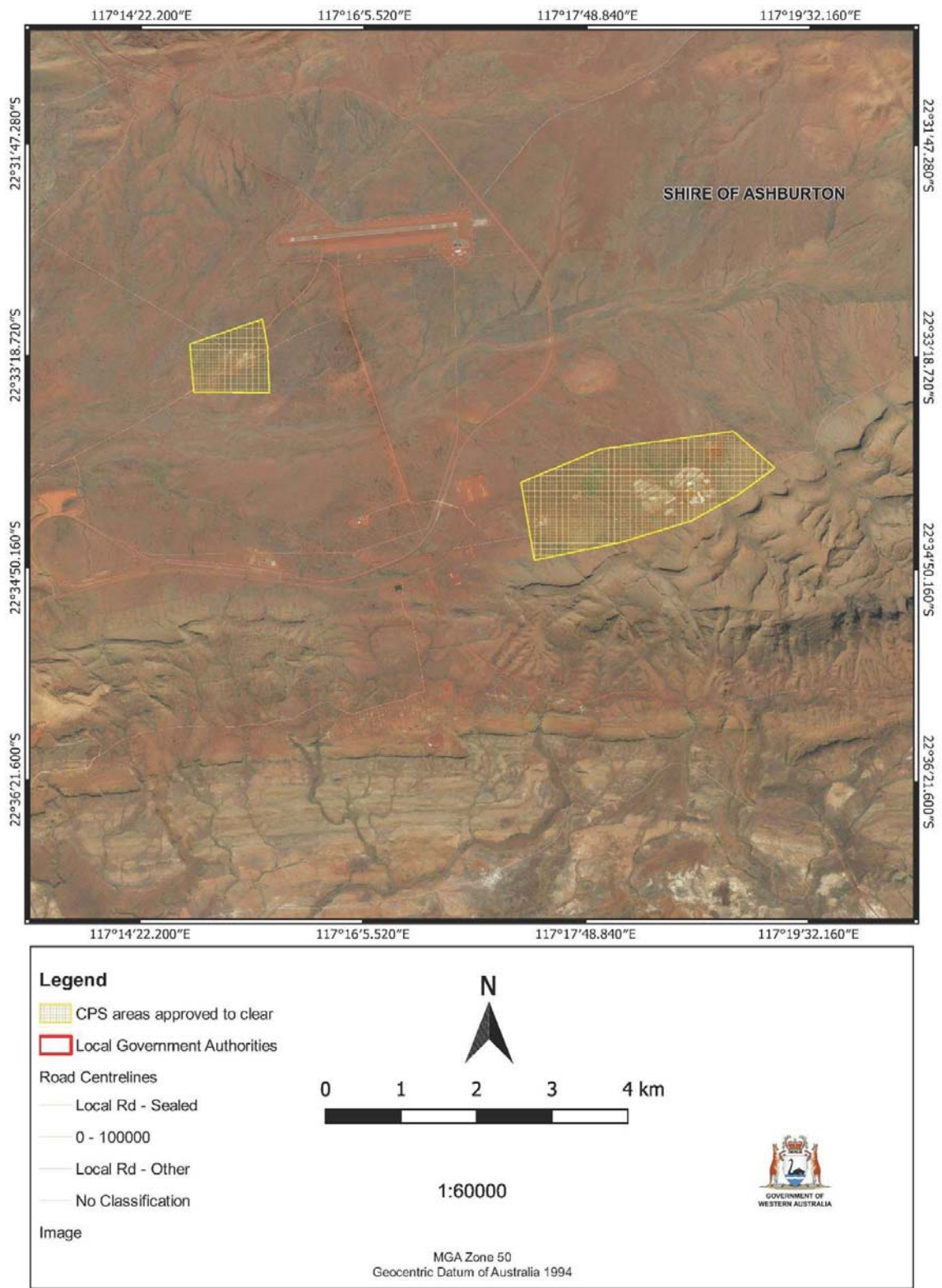


Figure 9: Map of the boundary of the areas within which clearing may occur

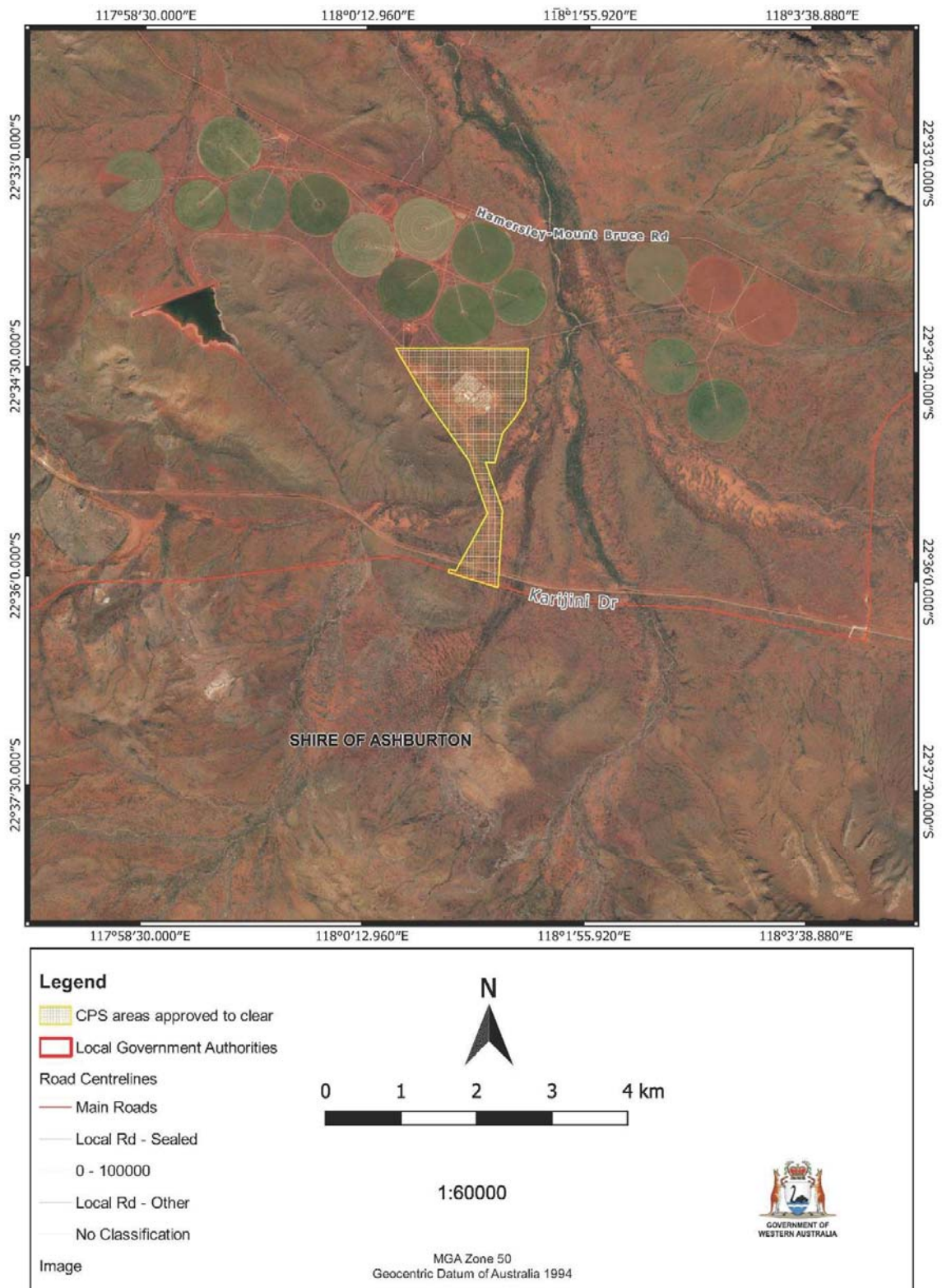


Figure 10: Map of the boundary of the areas within which clearing may occur

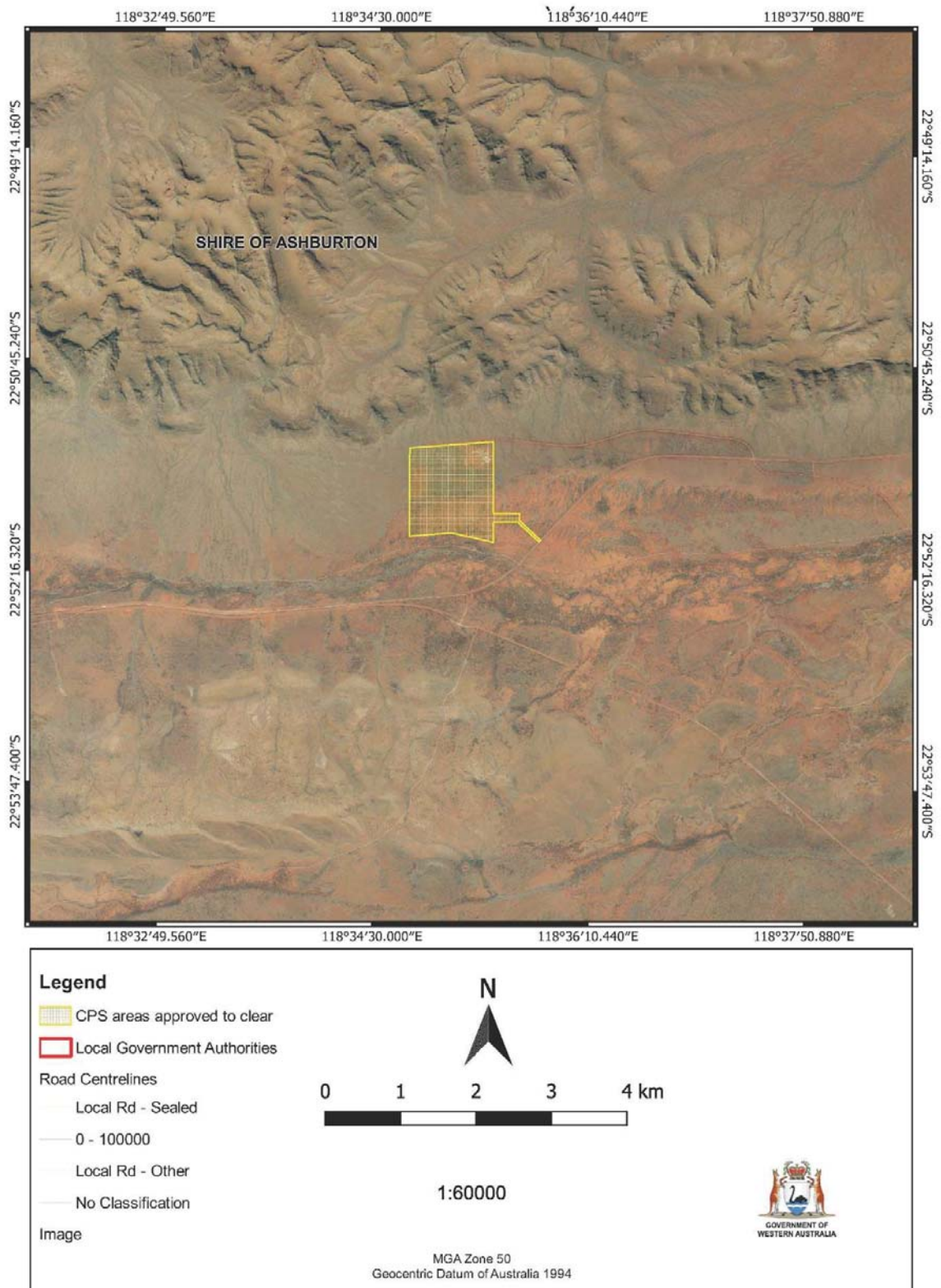


Figure 11: Map of the boundary of the areas within which clearing may occur

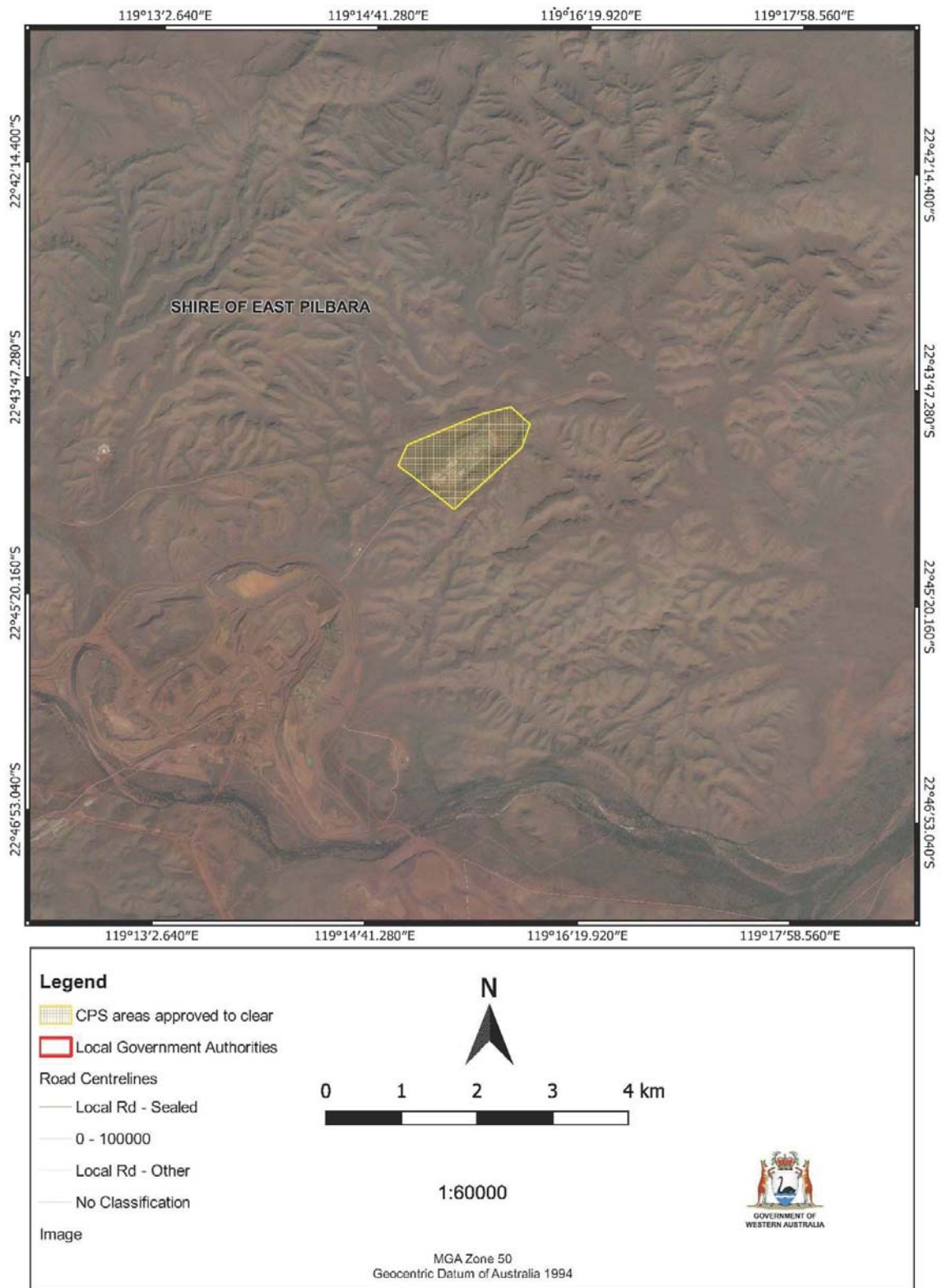


Figure 12: Map of the boundary of the areas within which clearing may occur

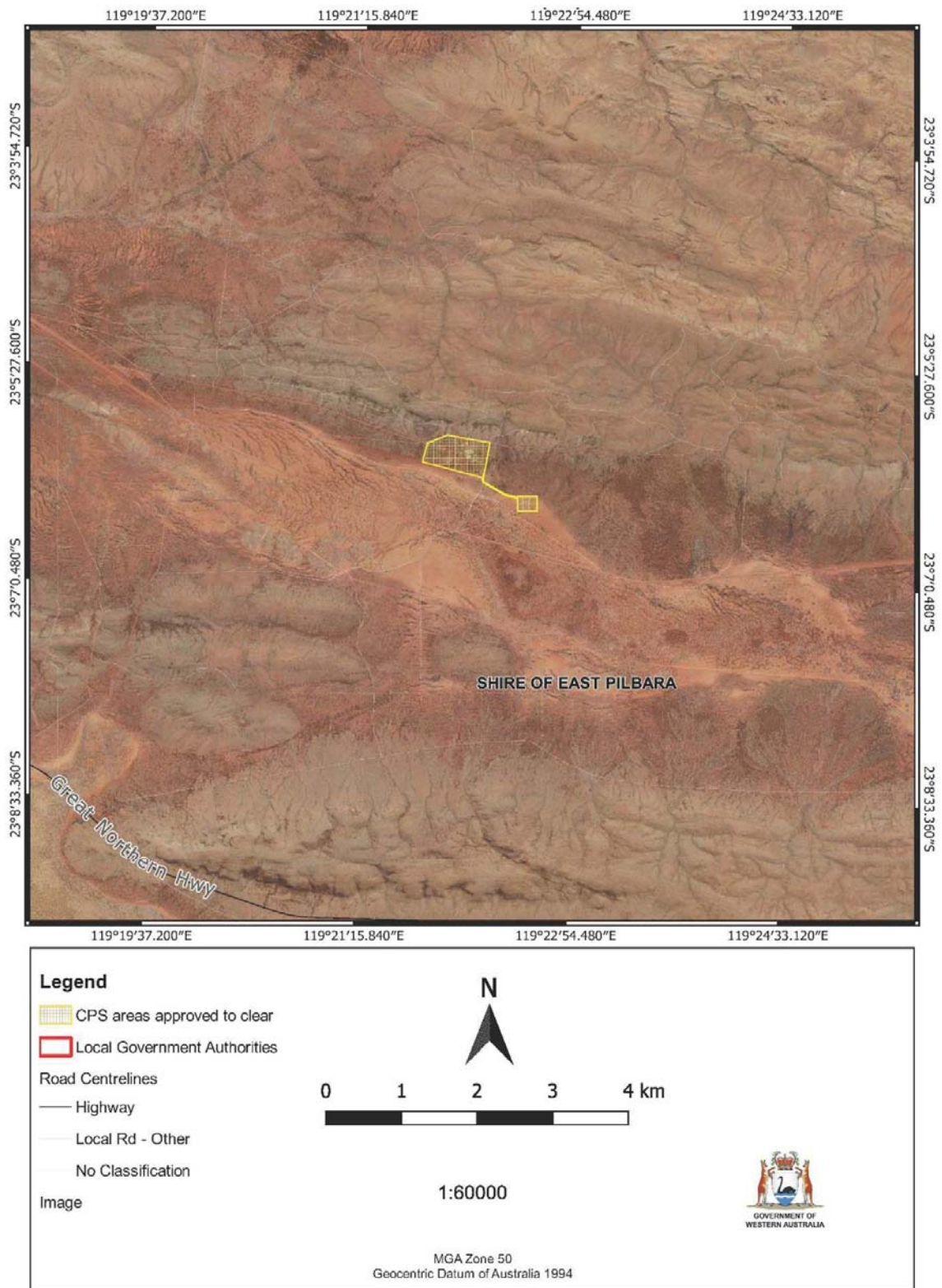


Figure 13: Map of the boundary of the areas within which clearing may occur

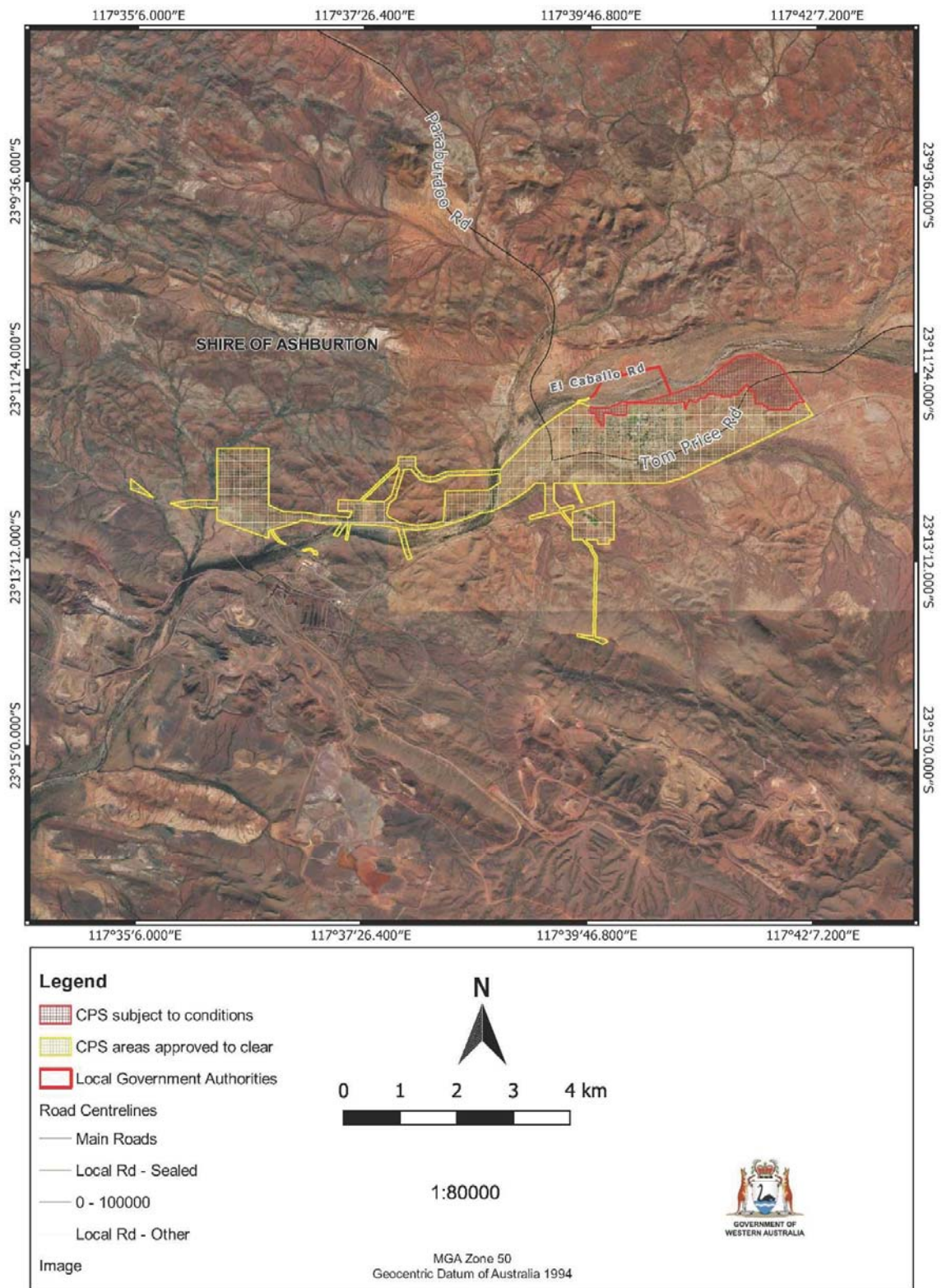


Figure 14: Map of the boundary of the areas within which clearing may occur



1. Application details

1.1. Permit application details

Permit application No.: 6110/6
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Pilbara Iron Company (Services) Pty Ltd
Application received date: 27 August 2020

1.3. Property details

Property: Clearing authorised under this Permit is to be undertaken within land tenure or rights administered under the *Mining Act 1904 (WA)*, *Mining Act 1978 (WA)*, *Land Act 1933 (WA)*, *Land Administration Act 1997 (WA)*, *Property Law Act 1969 (WA)*, *Transfer of Land Act 1893 (WA)*, *Strata Titles Act 1985 (WA)*, the *Rights in Water and Irrigation Act 1914 (WA)*, the *Water Corporation Act 1995 (WA)*, the *Water Agencies (Powers) Act 1984 (WA)* or the following State Agreement Acts –

- *Iron Ore (Hamersley Range) Agreement Act 1963*
- *Iron Ore (Robe River) Agreement Act 1964*
- *Iron Ore (Hamersley Range) Agreement Act 1968 (Paraburdoo)*
- *Iron Ore (Mount Bruce) Agreement Act 1972*
- *Iron Ore (Channar Joint Venture) Agreement Act 1987*
- *Iron Ore (Hope Downs) Agreement Act 1992*
- *Iron Ore (Yandicoogina) Agreement Act 1996*
- Karijini Drive Road reserve (Lot 106 on Plan 218877)

Local Government Authority: Shire of Ashburton
Shire of East Pilbara
City of Karratha

Localities: Maitland
Dampier
Juna Downs
Newman
Mount Sheila
Rocklea
Fortescue
Burrup
Chichester
Paraburdoo
Pannawonica
Hamersley Range
Cooya Pooya
Dampier Archipelago

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
75.3		Mechanical Removal	Building or structure

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 19 October 2021

Reasons for Decision: The clearing permit amendment application was received on 27 August 2020 and has been assessed against the clearing principles, planning instruments, and other matters in accordance with section 51O of the *Environmental Protection Act 1986*. It has been concluded that the assessment against the clearing principles is unchanged since the assessment for clearing permit CPS 6110/5 and that the proposed clearing is at variance to principle (f), may be at variance to principles (a), (b), (c) and (i), and is not likely to be at variance to any of the remaining clearing principles.

The Delegated Officer took into consideration that the proposed amendment relates only to increasing the overall clearing footprint by 2.3 hectares and increasing the total area authorised to be cleared under the permit to 75.3 hectares to allow clearing within the additional 2.3-hectare area. A review of current environmental information indicated that the additional area was unlikely to contain environmental values in addition to those present within the existing permit area.

A review of current environmental information identified that the environmental values present within the permit area also remain largely unchanged from the previous assessments of the permit. The Delegated Officer considered that the permit area may comprise suitable and significant habitat for conservation significant flora and fauna species, but determined that the existing permit conditions to undertake pre-clearing surveys and avoid and manage impacts to any individuals or critical habitat identified remain adequate to mitigate potential impacts to conservation significant flora and fauna species. The Delegated Officer also considered that vegetation within the permit area may be growing in association with a watercourse and that the proposed clearing had the potential to result in short-term impacts to water quality. The Delegated Officer determined that the existing permit condition to avoid clearing of riparian vegetation in the first instance was sufficient to mitigate impacts to the environmental values and quality of these riparian communities. The Delegated Officer considered these findings to be unchanged from the previous assessments of the permit.

The assessment identified that a portion of the existing permit area intersects the Paraburdoo Water Reserve Wellhead Protection Zone, which was not identified during previous assessments of the permit. The Delegated Officer considered that clearing within the Paraburdoo Water Reserve Wellhead Protection Zone may represent a significant risk to water quality and public health if extensive clearing is to occur within the Wellhead Protection Zone or clearing is undertaken for a purpose that is not a compatible land use. The Delegated Officer determined that an additional condition, limiting the purpose of clearing authorised within the Paraburdoo Water Reserve Wellhead Protection Zone to only compatible land uses, was suitable to mitigate the potential impacts to water quality.

In considering the above, the Delegated Officer determined that the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values remains unchanged from the original assessments and can be found in the Decision Reports prepared for Clearing Permits CPS 6110/1 and CPS 6110/2, with the exception of impacts to the Paraburdoo Water Reserve Wellhead Protection Zone. Noting the above, the Delegated Officer considered that, given the nature of the proposed amendments, the existing conditions under Clearing Permit CPS 6110/5 and an additional condition pertaining to the purpose of clearing within the Paraburdoo Water Reserve are sufficient to limit the impacts of the proposed clearing. The Delegated Officer determined that the proposed clearing can be managed to be environmentally acceptable with the existing avoid and minimise, weed control, flora management, fauna management, and vegetation management conditions.

2. Site Information

Clearing Description

The proposed amendment to CPS 6110/5 is for the purpose of increasing the overall clearing footprint by 2.3 hectares and increasing the total clearing area to 75.3 hectares to allow clearing within the additional 2.3-hectare area. CPS 6110/5 allowed for the clearing of up to 73 hectares of native vegetation within various properties, road reserves and unallocated Crown land, within the Shires of Ashburton, City of Karratha and Shire of East Pilbara, for the purpose of constructing town and camp infrastructure and associated works.

The Permit Holder originally applied to amend Clearing Permit CPS 6110/5 in order to increase the overall clearing footprint by 2.3 hectares and increase the total area of clearing to 88 hectares. The clearing permit amendment application was revised during the assessment process after reconsideration of the clearing required, resulting in a reduction in the total amount of clearing requested from 88 hectares to 75.3 hectares (see Section 3 for further details).

Records indicate that four hectares of clearing has been undertaken to date under CPS 6110/5.

Vegetation Description

The application area is mapped as Beard vegetation associations:

- 117: Hummock grasslands, grass steppe; soft spinifex;
- 152: Hummock grasslands, grass steppe; soft & hard spinifex soft spinifex;
- 173: Hummock grasslands, low tree steppe; snappy gum over soft spinifex & *Triodia brizoides*;
- 607: Hummock grasslands, low tree steppe; snappy gum & bloodwood over soft spinifex & *Triodia wiseana*;
- 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*;
- 565: Hummock grasslands, low tree steppe; bloodwood over soft spinifex;
- 29: Sparse low woodland; mulga, discontinuous in scattered groups;
- 18: Low woodland; mulga (*Acacia aneura*);
- 567: Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii*; and

- 181: Shrublands; mulga & snakewood scrub (Shepherd et al, 2001)

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)

To

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery 1994)

The condition of the vegetation was determined via aerial imagery, previous environmental assessments undertaken by the former Department of Mines and Petroleum and the former Department of Environment Regulation, and flora survey's undertaken by Mattiske Consulting Pty Ltd (2011) and Rio Tinto (2017) (Mattiske Consulting Pty Ltd, 2011; Rio Tinto, 2017).

Soil Type

The soil types within the application area are mapped as the following systems:

- Granitic System (256Gr), described as rugged granitic hills supporting shrubby hard and soft spinifex grasslands,
- Ruth System (289Rt), described as hills and ridges of volcanic and other rocks supporting shrubby hard spinifex and occasionally soft spinifex grasslands,
- Capricorn System (289Cp), described as rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs,
- Rocklea System (282Rk), described as basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs,
- Urandy System (285Uy), described as stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands,
- Newman System (285Ne), described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands,
- Boolgeeda System (284Bg), described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands,
- Calcrete System (285Ca), described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands,
- Table System (285Ta), described as low calcrete plateaux, mesas and lower plains supporting mulga and cassia shrublands and minor spinifex grasslands,
- Jurrwarrina System (285Ju), described as hardpan plains and alluvial tracts supporting mulga shrublands with tussock and spinifex grasses,
- Wannamunna System (285Wn), described as hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands and occasionally eucalypt woodlands,
- Marandoo System (285Md), described as basalt hills and restricted stony plains supporting grassy mulga shrublands, and
- River System (285Ri), described as narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex (DPIRD, 2021).

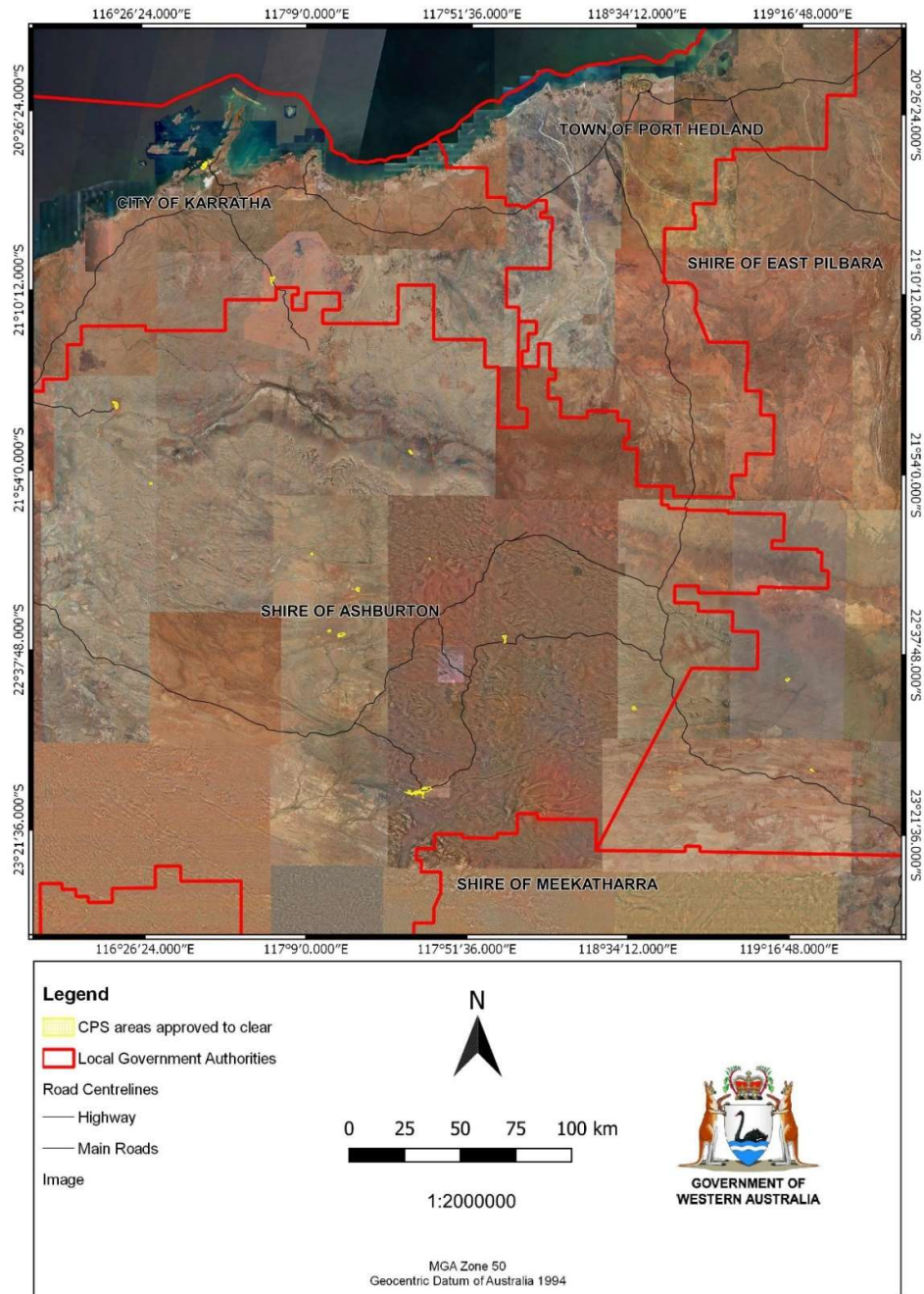


Figure 1: The areas crosshatched yellow indicate the areas authorised to be cleared under the granted clearing permit.

3. Avoidance and minimisation measures

The Permit Holder originally applied to amend Clearing Permit CPS 6110/5 in order to increase the overall clearing footprint by 2.3 hectares and increase the total area of clearing to 88 hectares (Pilbara Iron, 2020). During the assessment process, the Permit Holder revised the amendment after reconsideration of the clearing required for constructing town and camp infrastructure and associated works, and reduced the total clearing requested from 88 hectares to 75.3 hectares (Rio Tinto, 2021b).

The Permit Holder advised that the additional 2.3-hectare area at Figure 14 (refer clearing permit figures) is required to accommodate a new services corridor running parallel to the existing road from the existing Paraburdoo plant to a new construction camp (Rio Tinto, 2021b). The Permit Holder advised that clearing of native vegetation within this area is required to facilitate road maintenance and upgrades, and the installation of underground fibre optic cables (Rio Tinto, 2021b). The Permit Holder considered installation of the fibre optic cable within the existing road alignment to minimise the clearing required, however it was determined that this was not practicable as it would significantly interrupt mining operations along the existing road during the installation and ongoing maintenance of the cable (Rio Tinto, 2021b). The Permit Holder advised that the installation of underground fibre optic cables would be undertaken through underground boring and cable pulling where possible, to limit surface ground disturbance (Rio Tinto, 2021b).

The remaining avoidance and minimisation measures implemented by the Permit Holder are unchanged and can be found in the Decision Report prepared for Clearing Permits CPS 6110/1 and CPS 6110/2.

4. Assessment of application against clearing principles

The existing clearing footprint for CPS 6110/5 is comprised of 14 existing town and campsite areas (depicted on Figures 1-14 of the clearing permit) within the Shire of Ashburton, City of Karratha, and Shire of East Pilbara in the Pilbara Bioregion. The proposed amendment to CPS 6110/5 is for the purpose of increasing the overall clearing footprint by 2.3 hectares at Figure 14 and increasing the total clearing area to 75.3 hectares to allow clearing within the additional 2.3-hectare area.

Assessment relating to additional area

The additional 2.3-hectare area at Figure 14 is located at the south-western extent of the existing permit area at Paraburdoo (Figure 2). According to available databases, the additional area is mapped within Beard vegetation association 567 and is considered to comprise hummock grasslands and shrub steppe including *Acacia aneura* (mulga) and *Acacia inaequilatera* (kanji) over soft spinifex and *Triodia basedowii*. This is consistent with the mapped vegetation type for the majority of the existing permit area at Figure 14. The additional area is also mapped within the River, Marandoo and Newman soil systems, which is consistent with the existing permit area at Figure 14. As the mapped soil and vegetation types within the additional area are consistent with the existing permit area at Figure 14, it is considered that the habitat values of the additional area are also aligned with those present in the existing permit area. A review of current environmental information indicates that the additional area provides suitable and potentially significant habitat for eight threatened or priority flora species and nine conservation significant fauna species, being the same species that have the potential to occur within the greater permit area at Figure 14. The additional 2.3-hectare area is not considered likely to comprise part of, or be necessary for the maintenance of, a threatened or priority ecological community and clearing within this area is not considered likely to impact on the environmental values of a conservation area, given the distance and separation from the nearest conservation significant ecological community (approximately 90 kilometres) and conservation area (approximately 40 kilometres). In regard to water resources, a review of current environmental information indicates that the additional 2.3-hectare area intersects a non-perennial tributary of the Ashburton River, which extends into the existing permit area at Figure 14. The potential for impacts to the non-perennial tributary, surface and groundwater, land degradation, and flooding is considered consistent with the assessment for the greater permit area at Figure 14, noting the additional 2.3-hectare area does not intersect land or water resources in addition to those of the existing permit area. Given the above and a review of current environmental information, the additional 2.3-hectare area is not considered to contain environmental values in addition to those present within the existing permit area at Figure 14.

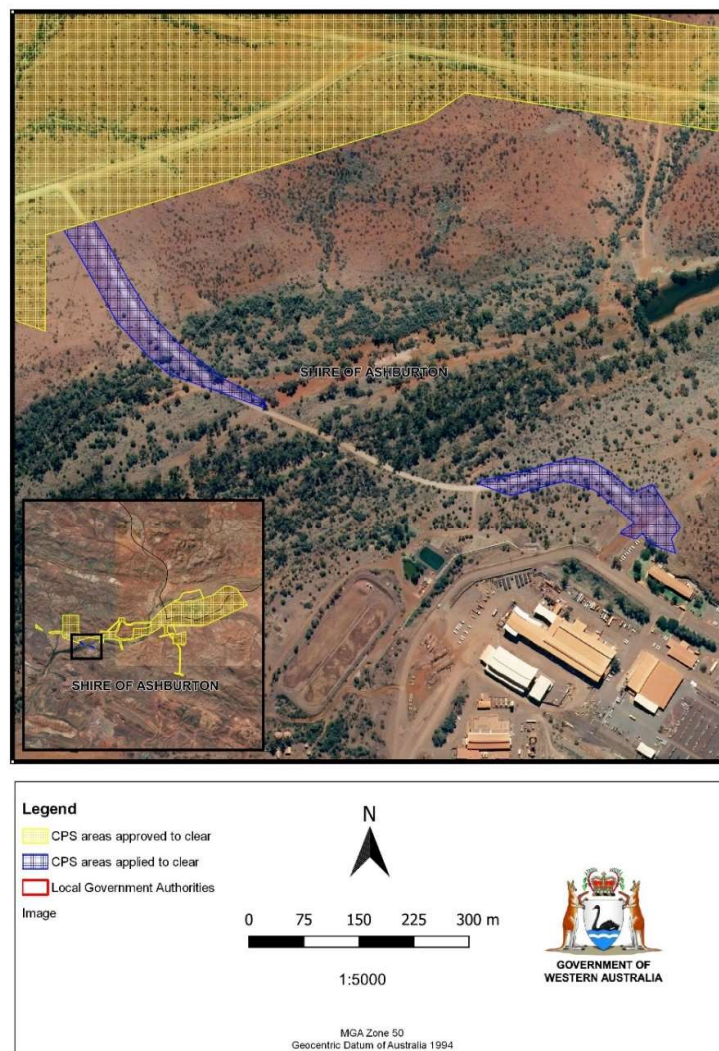


Figure 2. The area crosshatched blue indicates the additional 2.3-hectare area to be included in the amended permit, the area crosshatched yellow indicates the existing permit area approved under Clearing Permit CPS 6110/5.

Assessment relating to current environmental information

A review of current environmental information indicates that the environmental values present within the existing permit area remain largely unchanged from the previous assessments of the permit. Noting that the environmental values of the additional 2.3-hectare area at Figure 14 are considered to be consistent with the existing permit area at Paraburdoo (see assessment above), the assessment below includes consideration of current environmental information pertaining to both the existing permit area and the additional 2.3-hectare area to be included in the amended permit.

Conservation significant flora

In regards to conservation significant flora, noting that biological surveys undertaken for the areas under the permit are dated between 2004 and 2017 and that surveys have not been conducted for the entire permit area, a desktop review of current databases was undertaken for the local area (a 50-kilometre radius from each clearing area). The desktop assessment identified a total of 134 threatened or priority flora species within the local area, comprising 34 Priority 1 (P1) flora, 21 Priority 2 (P2) flora, 66 Priority 3 (P3) flora, 10 Priority 4 (P4) flora, and three threatened flora (Western Australian Herbarium, 1998-). Of these species, 87 were considered during the previous assessments of the permit according to available records. According to available databases, there have been new records of three of these species within the local area since the previous assessment of the permit was undertaken in 2019. The remaining 47 species identified in the desktop assessment were not considered during the previous assessments of the permit, according to available records. Based on a review of current environmental information, site characteristics, conservation status, habitat preferences, and the distribution and extent of existing records, 20 conservation significant flora species recorded in the local area have the potential to occur within the permit area and impacts to individuals resulting from the proposed clearing may represent a significant impact to continuation of the species (see Appendix A).

The previous assessments of Clearing Permit CPS 6110 also determined that the permit area may provide suitable and significant habitat for threatened and priority flora species. To mitigate this risk, the existing permit includes a flora management condition requiring a botanist to conduct a targeted flora survey of the areas proposed to be cleared prior to undertaking any clearing authorised under the permit. Where threatened or priority flora species are identified within the permit area during the targeted flora survey, all individuals must be demarcated and no clearing of individuals or their relevant buffers (20 to 50 metres) is permitted, unless otherwise approved by DWER. The Permit Holder has undertaken flora surveys of the areas that have already been cleared under previous versions of the permit, in accordance with this condition, and no conservation significant flora have been identified within the permit area to date (Rio Tinto, 2021a). Given the existing flora management condition, it is not considered likely that the proposed amendments to CPS 6110/5 or the clearing proposed under CPS 6110/6 represents a significant risk to the 20 conservation significant flora species identified above, as all individuals identified during the pre-clearing flora surveys will be avoided and buffers will be maintained to mitigate indirect impacts to populations. Given the above, the Delegated Officer determined that the assessment of impacts to flora species remains unchanged from the previous assessments of the permit and that the existing permit conditions are still adequate to mitigate any potential impacts to conservation significant flora.

Conservation significant fauna

In regards to fauna, a desktop assessment identified that a total of 108 conservation significant fauna species have been recorded within the local area, including 35 threatened fauna species, 27 priority fauna species, 42 fauna species protected under international agreement, three other specially protected fauna species, and one extinct species (DBCA, 2007-). According to available databases, there have been new records of six of these species within the local area since the previous assessment of the permit was undertaken in 2019. With consideration of the site characteristics, relevant data sets and the habitat preferences and distribution of the aforementioned species, 61 conservation significant fauna species recorded in the local area have the potential to occur within the permit area (see Appendix B). Of these species, it was considered that suitable habitat for 34 species is only present within the permit area at Figure 1 in Dampier and does not occur within any other permit area, including 30 species of migratory waterbird, three species of marine turtle and *Mormopterus cobourgianus* (north-western free-tailed bat). This is due to the fact that the permit area at Figure 1 includes coastal dune vegetation and sandy beaches that may be suitable as foraging, roosting and nesting habitat for these species. A further three species of subterranean fauna have the potential to occur within the permit area at Figure 4 only, in association with the Stygofaunal Community of the Bungaroo Aquifer priority ecological community (PEC), and are not likely to occur within any other permit area. Suitable habitat for the remaining 24 species includes woodland or shrubland over spinifex (*Triodia* spp.) grassland and may occur in various permit areas. If significant habitat resources are present within the permit area, for example nesting habitat for migratory bird species or marine turtles, roost sites for bat species, or *Pseudomys chapmani* (western pebble-mound mouse) pebble mounds, the proposed clearing may represent a significant impact to fauna species.

The previous assessments of Clearing Permit CPS 6110 also determined that the permit area may provide suitable and significant habitat for conservation significant fauna species. To mitigate this risk, the existing permit includes a fauna management condition requiring a fauna specialist to undertake a fauna survey of the areas proposed to be cleared to identify areas of habitat on which threatened and priority fauna have a specific dependence, prior to undertaking any clearing authorised under the permit. Where conservation significant fauna or areas of habitat on which these fauna have a specific dependence are identified within the permit area, clearing of this habitat must be avoided in the first instance. Where clearing of areas of habitat on which threatened fauna have a specific dependence cannot be avoided, the Permit Holder must develop and implement a Fauna Management Plan including provisions for managing impacts to fauna habitat and managing any individuals identified during the fauna survey. The Fauna Management Plan must be approved by DWER, prior to being implemented by the Permit Holder. The Permit Holder has undertaken fauna surveys of the areas that have already been cleared under previous versions of the permit, in accordance with this condition, and no conservation significant fauna or areas of habitat on which threatened fauna have a specific dependence have been identified within the permit area to date (Rio Tinto, 2021a). Given the existing fauna management condition, it is not considered likely that the proposed amendments to CPS 6110/5 or the clearing proposed under CPS 6110/6 represents a significant risk to the 61 conservation significant fauna species above. It is also acknowledged that the local area is extensively vegetated and that the mapped vegetation associations within the permit area are well-represented in the local area (see Appendix C). Therefore, it is considered that suitable habitat for the above species is not limited to the permit area and it is expected that individuals present within the permit area at the time of clearing will be able to disperse into adjacent suitable habitat. Given the above, the Delegated Officer determined that the assessment of impacts to fauna species remains unchanged from the previous assessments of the permit and that the existing permit conditions are still adequate to mitigate any potential impacts to conservation significant fauna.

Ecological communities

A review of current environmental information indicates that the existing clearing footprint at Figure 4 intersects an occurrence of the Stygofaunal Community of the Bungaroo Aquifer Priority 1 PEC, which was not identified in previous assessments of the clearing permit. The Department of Biodiversity, Conservation and Attractions (DBCAs) describes the Stygofaunal Community of the Bungaroo Aquifer PEC as a unique assemblage of aquatic subterranean fauna including eels, snails and other stygofauna (DBCAs, 2021). Stygofauna are defined as animals that live permanently underground in water, typically occurring several metres underground in habitats ranging from tiny spaces between sand grains to pools and streams in caves (DBCAs, 2015). According to available databases, the Stygofaunal Community of the Bungaroo Aquifer PEC includes significant habitat for a number of conservation significant subterranean fauna species including *Ophisternon candidum* (the blind cave eel), *Nedsia hurlberti*, and *Nedsia sculptilis*. DBCAs states that the biggest threat to the Stygofaunal Community of the Bungaroo Aquifer PEC is groundwater drawdown through mining processes (DBCAs, 2021). Clearing Permit CPS 6110/5 allows for clearing for the purpose of constructing town and camp infrastructure and undertaking associated works only and does not relate to clearing required for mining processes. It is not anticipated that the maintenance of infrastructure or associated works will require groundwater abstraction or will result in direct impacts to the underground Stygofaunal Community of the Bungaroo Aquifer PEC. The Permit Holder has confirmed that future works at Figure 4 will involve surface works only, including clearing to facilitate maintenance of the existing camp infrastructure and decommissioning or rehabilitating the camp area in the future (Rio Tinto, 2021b). The Permit Holder has also confirmed that no threatening processes specific to the Stygofaunal Community of the Bungaroo Aquifer PEC (i.e., groundwater drawdown or mining processes) will result from the clearing proposed under CPS 6110/6 and that no indirect impacts, such as changes to surface water flow or infiltration, are proposed (Rio Tinto, 2021b). Given the nature of the proposed clearing, the Delegated Officer determined that the proposed amendments to CPS 6110/5 and the clearing proposed under CPS 6110/6 were unlikely to result in significant impacts to the Stygofaunal Community of the Bungaroo Aquifer PEC.

Outside of the Stygofaunal Community of the Bungaroo Aquifer PEC, the closest PEC is an occurrence of the Brockman Iron cracking clay communities of the Hamersley Range (Brockman Iron cracking clay communities) PEC approximately 100 metres west of Figure 7. The closest state-listed threatened ecological community (TEC) is an occurrence of the Themeda grasslands on cracking clays (Hamersley Station, Pilbara) (Themeda grasslands) TEC approximately 2.3 kilometres south of Figure 7. Impacts to both the Brockman Iron cracking clay communities PEC and the Themeda grasslands TEC were considered during previous assessments of the permit, during which the Permit Holder committed to maintaining the 100-metre buffer between any works at Figure 7 and the Brockman Iron cracking clay communities PEC to mitigate indirect impacts. Given the above and the distance and separation from the nearest state-listed TEC, the Delegated Officer determined that the assessment of impacts to TECs and PECs remains unchanged from the previous assessments of the permit and that the proposed amendments to CPS 6110/5 and the clearing proposed under CPS 6110/6 were unlikely to result in significant impacts to these communities.

Conservation areas and significant remnant vegetation

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The extent of native vegetation in the Pilbara Bioregion and the mapped vegetation types within the application area remain consistent with the national objectives and targets for biodiversity conservation in Australia (see Appendix C). The Delegated Officer considers that the permit area does not occur within an extensively cleared landscape and impacts to significant remnant vegetation remain unchanged from the previous assessments of the permit.

The closest conservation areas to the permit area remain Karijini National Park approximately 200 metres west of Figure 11 and one kilometre south of Figure 10, Murujuga National Park approximately 1.2 kilometres south-east of Figure 1, and Millstream Chichester National Park approximately 1.6 kilometres south-east of Figure 2. The Delegated Officer determined that, given the distance and separation from the closest conservation areas and the extensively vegetated local area, the proposed amendments to CPS 6110/5 and the clearing proposed under CPS 6110/6 are unlikely to result in significant impacts to the environmental values of local conservation areas and that the assessment of impacts to conservation areas remains unchanged.

Land and water resources

In regard to water resources, it is acknowledged that the permit area at Figure 6 is adjacent to a major tributary of the Ashburton River and that the remaining permit areas intersect various non-perennial minor tributaries of Duck Creek and the Maitland, Robe, Fortescue, and Ashburton rivers. The permit areas are also mapped within the Pilbara Surface Water Area and the Pilbara Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). Regarding groundwater, groundwater salinity within the permit area is mapped as 500 to 3000 milligrams per litre total dissolved solids and it is not anticipated that clearing for the maintenance of infrastructure or associated works will require groundwater abstraction or result in direct or indirect impacts to groundwater resources. The previous assessments of the permit acknowledge that the permit area is likely to include vegetation growing in, or in association with, an environment associated with a watercourse and that the proposed clearing has the potential to result in short-term impacts to surface water quality through turbidity and sedimentation resulting from the removal of riparian vegetation. To mitigate this risk, the existing permit includes a vegetation management condition, requiring the Permit Holder to avoid the clearing of riparian vegetation in the first instance. Where the clearing of riparian vegetation cannot be avoided, the Permit Holder is required to maintain the existing surface flow of the watercourse by use of culverts. Given the above and the existing vegetation management condition, the Delegated Officer determined that the proposed amendments to CPS 6110/5 and the clearing proposed under CPS 6110/6 are unlikely to result in significant impacts to the environmental values of the associated watercourses or result in significant impacts to surface or groundwater resources, and that the assessment of these impacts remains unchanged from previous assessments of the permit.

The desktop assessment also identified that the permit area intersects five Public Drinking Water Source Areas proclaimed under the *Country Areas Water Supply Act 1947* (CAWSA), including the Harding Dam Catchment Area (P1), the Pannawonica Water Reserve (Priority not assigned), the Bungaroo Creek Water Reserve (P1), the Millstream Water Reserve (P2), and the Paraburdoo Water Reserve (P1), which were not identified in previous assessments of the clearing permit. Advice received from DWER's Water Source Protection Planning Branch (Water Source Protection) indicated that the existing permit area that intersects the Harding Dam Catchment Area at Figure 2, the Pannawonica Water Reserve at Figure 3, the Bungaroo Creek Water Reserve at Figure 4, and the Millstream Water Reserve at Figure 5 and Figure 7, is located outside of the Wellhead Protection Zones (WHPZs) for these resources (DWER, 2021b). Water Source Protection advised that the proposal does not represent a significant risk to water quality in these areas, given clearing activities and associated works are undertaken in accordance with best management practices outlined in the relevant Water Quality Protection Notes (WQPN) (DWER, 2021b; see *Planning instruments and other relevant matters*). However, Water Source Protection advised that the existing permit area at Figure 14 is located within the Paraburdoo Water Reserve WHPZ and may represent a significant risk to water quality and public health if extensive clearing is to occur within the WHPZ or clearing is undertaken for a purpose that is not a compatible land use within the WHPZs of Priority 1 PDWSAs as per WQPN 25, for example constructing infrastructure or on-site wastewater treatment systems (DWER, 2021b). In response to the advice received from Water Source Protection, the Permit Holder advised that future works within the Paraburdoo Water Reserve at Figure 14 would be limited to activities that are compatible land uses outlined in WQPN 25, including clearing for the purpose of maintaining the existing roads and access tracks, works associated with the existing monitoring bore network and maintaining power infrastructure (Rio Tinto, 2021). The Delegated Officer determined to include an additional condition on the amended permit, ensuring clearing undertaken within the Paraburdoo Water Reserve was limited to clearing for the purposes maintaining the existing roads and access tracks, works associated with the existing monitoring bore network and maintaining power infrastructure. The Delegated Officer considered that this additional condition was sufficient to mitigate potential impacts to water quality and human health resulting from the proposed clearing and to ensure that works within the Paraburdoo Water Reserve WHPZ were limited to the compatible land uses outlined in WQPN 25.

In regard to land resources, a desktop assessment identified no new environmental information that would significantly alter the previous assessment of the permit. The mapped soil types within the permit area are not susceptible to land degradation, with the exception of the River System (285Ri) which may be susceptible to erosion when surface vegetation is removed (Van Vreeswyk et al., 2004). The River System is described as narrow, seasonally active flood plains and major river channels and is only mapped within a portion of the permit area at Figure 14 that intersects non-perennial tributaries of the Ashburton River. As the vegetation within the River System is growing in association with tributaries of the Ashburton River, this vegetation would be considered riparian and would be subject to the vegetation management condition described above. Given the existing vegetation management condition, it is considered that the removal of surface vegetation within the River System will be minimal and unlikely to lead to appreciable land degradation. Further, the purpose of the proposed clearing is to construct town and camp infrastructure and undertake associated works such as maintaining access roads and power infrastructure, and it is not considered likely that cleared areas will be exposed to weathering for long periods of time. Mean annual rainfall in the permit area is also low (approximately 300 to 500 millimetres) and topographic contours in the surrounding area do not indicate the proposed clearing is

likely to contribute to increased flooding or waterlogging. Given the above, the Delegated Officer determined that the proposed amendments to CPS 6110/5 and the clearing proposed under CPS 6110/6 are unlikely to result in appreciable land degradation or cause, or exacerbate, the incidence or intensity of flooding or waterlogging in the local area, and that the assessment of these impacts remains unchanged from previous assessments of the permit.

Planning instruments and other relevant matters

The amendment application was advertised on the Department of Water and Environmental Regulation's website on 18 September 2020, inviting submissions from the public within a 21-day period. No submissions were received in relation to this application.

The Shires of Ashburton and East Pilbara, and City of Karratha were invited to provide comments on the proposed amendment to CPS 6100/5. To date, no response has been received from any Local Government Authority.

A review of the annual reports submitted to the Department of Water and Environmental Regulation (DWER) was conducted for previous versions of CPS 6110/5. It was determined following this investigation that a total of four hectares of clearing has been undertaken to date under CPS 6110/5 (Table 1; Rio Tinto, 2021a).

Table 1. Clearing undertaken to date under Clearing Permit CPS 6110/5 (Rio Tinto, 2021a).

Item	Area/Period of Clearing
Clearing completed during the report period (ha)	1.80
Date(s) during the report period when clearing was undertaken	1 January – 31 December 2020
Clearing completed in previous report periods (ha)	2.22
Total clearing conducted under the permit (ha)	4.0
Total approved clearing under the permit (ha)	73

As discussed above, it is acknowledged that the permit area intersects five PDWSAs proclaimed under CAWSA, including the Harding Dam Catchment Area at Figure 2, the Pannawonica Water Reserve at Figure 3, the Bungaroo Creek Water Reserve at Figure 4, the Millstream Water Reserve at Figure 5 and Figure 7, and the Paraburdoo Water Reserve at Figure 14. Water Source Protection advised that, while undertaking the clearing and associated works under CPS 6110/6, the Permit Holder should follow best management practices outlined in the following WQPNs:

- [WQPN 56: Tanks for fuel and chemical storage near sensitive water resources](#),
- [WQPN 83: Infrastructure corridors near sensitive water resources](#),
- [WQPN 6: Vegetation buffers to sensitive water resources](#),
- [WQPN 10: Contaminant spills – emergency response plan](#), and
- [WQPN 65: Toxic and hazardous substances](#) (DWER, 2021b).

Water Source Protection also advised that all activities undertaken within the PDWSAs should be consistent with [WQPN 25: Land use compatibility tables for public drinking water source areas](#), which includes conditions for construction and mining camps within P1 PDWSAs (DWER, 2021b).

As discussed above, the permit areas are also mapped within the Pilbara Surface Water Area and the Pilbara Groundwater Area proclaimed under the RIWI Act. DWER's Water Licensing – North West Region (North West Region) advised, that while undertaking the clearing and associated works under CPS 6110/6, the Permit Holder should follow best management practices outlined in [WQPN 83: Infrastructure corridors near sensitive water resources](#) (DWER, 2021a). In particular, the North West Region advised that the number of waterway crossings should be minimised, with the least practical interference with the natural flow and aquatic ecology of the waterway. Interference to waterway flow regimes and aquatic environments can be reduced by the use of bridges rather than fords, buried pipe-work or box culverts. Infrastructure corridors that cross waterways should:

- Replicate the natural cross-sectional area and shape of the waterway so that flows are not constrained or upstream flooding risk increased.
- Follow the natural ground contours where practical.
- Be scheduled to avoid storm events and during low flow periods.
- Be well signposted to prevent or lessen the risk of disturbance.
- Ensure summary information on waterway crossing hydraulics and backwater impacts is provided with the development submission.
- Avoid alteration of the natural waterway bed and banks, otherwise a bed and banks permit would need to be applied for as required by the Rights in Water and Irrigation Act 1914
- Incorporate construction measures to minimise the risk of erosion of stream banks.
- Avoid crossings at waterway bends and ensure they are made at 90 degrees to the flow channel
- Avoid crossing of meandering or dynamic waterways, especially where there is a high risk of meander progression and increased channel erosion (DWER, 2021a).

The North West Region also advised that the Pilbara Surface Water Area and the Pilbara Groundwater Area are subject to licensing requirements under the RIWI Act, including the requirement to obtain a Bed and Banks permit to obstruct, interfere, or destroy the bed or banks of a watercourse (DWER, 2021a). The North West Region advised that a section 17 Bed and Banks permit under the RIWI Act would not be required for maintenance works conducted on mining tenure, given the works do not involve the taking or diversion of water (DWER, 2021a). The North West Region advised that maintenance works within the bed or banks of a watercourse on any other tenure type will require a Bed and Banks permit under the RIWI Act and that the use of groundwater or surface water will require a 5C license under the RIWI Act (DWER, 2021a).

The additional 2.3-hectare area at Figure 14 does not intersect any areas classified under the *Contaminated Sites Act 2003*. The existing permit area intersects six sites classified under the *Contaminated Sites Act 2003*. DWER's Contaminated Sites Branch

(Contaminated Sites) did not advise of any concerns relating to the proposed amendments to CPS 6110/5 or the clearing proposed under CPS 6110/6 (DWER, 2020).

The permit area intersects several Aboriginal Sites of Significance. 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

The remaining assessment against planning instruments and other matters is unchanged and can be found in the Decision Reports prepared for Clearing Permits CPS 6110/1 and CPS 6110/2.

Appendix A. Flora analysis table

With consideration for the site information set out above, relevant current datasets (see Appendix D), past biological survey information (Mattiske Consulting Pty Ltd, 2011; Rio Tinto, 2017), and the extent and distribution of existing records, 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 in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Aluta quadrata</i>	T	Y	Y	Y		17	N
<i>Arthropodium vanleeuwenii</i>	2	Y	Y	Y		6	N
<i>Eragrostis</i> sp. Mt Robinson (S. van Leeuwen 4109)	1	Y	Y	Y		10	N
<i>Eremophila</i> sp. Mt Channar Range (C. Keating & M.E. Trudgen CK 408)	1	Y	Y	Y		2	N
<i>Eremophila</i> sp. Snowy Mountain (S. van Leeuwen 3737)	1	Y	Y	Y		1	N
<i>Eremophila</i> sp. West Angelas (S. van Leeuwen 4068)	1	Y	Y	Y		6	N
<i>Eucalyptus lucens</i>	1	Y	Y	Y		6	N
<i>Goodenia pedicellata</i>	1	Y	Y	Y		11	N
<i>Helichrysum oligochaetum</i>	1	Y	Y	Y		10	N
<i>Hibiscus campanulatus</i>	1	Y	Y	Y		19	N
<i>Hibiscus</i> sp. Mt Brockman (E. Thoma ET 1354)	1	Y	Y	Y		13	N
<i>Scaevola</i> sp. Hamersley Range basalts (S. van Leeuwen 3675)	2	Y	Y	Y		12	N
<i>Seringia exastia</i>	T	Y	Y	Y		92	N
<i>Synostemon hamersleyensis</i>	1	Y	Y	Y		6	N
<i>Tetradlea butcheriana</i>	1	Y	Y	Y		6	N
<i>Thryptomene wittveri</i>	T	Y	Y	Y		4	N
<i>Trianthema</i> sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)	2	Y	Y	Y		12	N
<i>Triodia mallota</i>	1	Y	Y	Y		4	N
<i>Triodia</i> sp. Silvergrass (P.-L. de Kock BES 00808)	1	Y	Y	Y		14	N
<i>Xerochrysum boreale</i>	3	Y	Y	Y		3	N

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

Appendix B. Fauna analysis table

With consideration for the site information set out above, relevant current datasets (see Appendix D), past biological survey information (Mattiske Consulting Pty Ltd, 2011; Rio Tinto, 2017), and the extent and distribution of existing records, 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 in local area (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Amytomis striatus striatus</i> (Striated grasswren)	P4	Y	Y		16	N
<i>Calidris canutus</i> (Red knot)	EN	Y	Y		19	N
<i>Calidris ferruginea</i> (Curlew Sandpiper)	CR	Y	Y		44	N
<i>Calidris tenuirostris</i> (Great knot)	CR	Y	Y		70	N
<i>Charadrius leschenaultia</i> (Greater sand plover)	VU	Y	Y		140	N
<i>Charadrius mongolus</i> (Lesser Sand Plover)	EN	Y	Y		45	N
<i>Chelonia mydas</i> (Green turtle)	VU	Y	Y		405	N
<i>Dasyercus blythi</i> (Brush-tailed mulgara)	P4	Y	Y		6	N
<i>Dasyurus hallucatus</i> (Northern quoll)	EN	Y	Y		3015	N
<i>Elanus scriptus</i> (Letter-winged kite)	P4	Y	Y		8	N
<i>Eretmochelys imbricata</i> (Hawksbill turtle)	VU	Y	Y		544	N
<i>Falco peregrinus</i> (Grey falcon)	OS	Y	Y		105	N
<i>Lagorchestes conspicillatus leichardti</i> (Spectacled hare-wallaby)	P4	Y	Y		8	N
<i>Leggadina lakedownensis</i> (Lakeland Downs mouse)	P4	Y	Y		364	N
<i>Leiopotherapon aheneus</i> (Fortescue grunter)	P4	Y	Y		86	N
<i>Liasis olivaceus barroni</i> (Pilbara olive python)	VU	Y	Y		217	N
<i>Macroderma gigas</i> (Ghost bat)	VU	Y	Y		532	N
<i>Macrotis lagotis</i> (Bilby)	VU	Y	Y		36	N
Migratory waterbirds (24 species)	MI	Y	Y		-	N
<i>Natator depressus</i> (Flatback turtle)	VU	Y	Y		2279	N
<i>Nedsia hurlberti</i> (freshwater amphipod)	VU	Y	Y		30	N
<i>Nedsia sculptilis</i> (freshwater amphipod)	VU	Y	Y		12	N
<i>Notoscincus butleri</i> (Lined soil-crevice skink)	P4	Y	Y		365	N
<i>Numenius madagascariensis</i> (Eastern curlew)	CR	Y	Y		161	N
<i>Ophisternon candidum</i> (Blind cave eel)	VU	Y	Y		10	N
<i>Pseudomys chapmani</i> (Western pebble-mound mouse)	P4	Y	Y		997	N
<i>Rhinonicteris aurantia</i> (Pilbara) (Pilbara leaf-nosed bat)	VU	Y	Y		1990	N
<i>Sternula nereis nereis</i> (Fairy tern)	VU	Y	Y		65	N
<i>Tringa brevipes</i> (Grey-tailed tattler)	P4	Y	Y		299	N

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority, EX: extinct, MI: migratory species; CD: Species of special conservation interest (conservation dependent fauna).

Appendix C. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all managed land (ha)	Current proportion (%) of 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
Beard Vegetation Association					
18	19,890,666.60	19,842,830.40	99.76	1,317,179.00	6.62
29	7,903,991.45	7,898,973.24	99.94	496,367.56	6.28
82	2,565,901.28	2,553,206.19	99.51	295,377.96	11.51
117	897,107.77	883,704.60	98.51	129,205.67	14.4
152	306,407.02	306,306.40	99.97	12,971.32	4.23
173	1,753,104.09	1,748,260.83	99.72	238,705.37	13.62
181	1,697,291.35	1,695,240.74	99.88	278,890.98	16.43
565	143,438.92	143,427.36	99.99	-	-
567	777,506.85	774,895.91	99.66	197,317.79	25.38
607	120,789.19	120,599.81	99.84	15,509.10	12.84
609	74,186.11	72,765.18	98.08	-	-
Beard Vegetation Association within IBRA Bioregion					
18 (Pilbara)	676,556.72	671,843.35	99.30	170,297.48	25.17
29 (Pilbara)	1,133,219.76	1,131,712.01	99.87	106,259.86	9.39
82 (Pilbara)	2,563,583.23	2,550,888.14	99.50	295,377.96	11.52
117 (Pilbara)	82,705.78	78,096.64	94.43	17,600.29	21.28
152 (Pilbara)	177,945.83	177,845.21	99.94	12,971.32	7.29
173 (Pilbara)	1,752,520.89	1,747,677.63	99.72	238,705.37	13.62
181 (Pilbara)	65,090.45	63,204.50	97.10	4,957.36	7.62
565 (Pilbara)	108,956.73	108,945.16	99.99	-	-
567 (Pilbara)	776,823.96	774,213.03	99.66	197,317.79	25.4
607 (Pilbara)	120,789.19	120,599.81	99.84	15,509.10	12.84
609 (Pilbara)	74,186.11	72,765.18	98.08	-	-

*Government of Western Australia (2019)

Appendix D. References

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- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
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- 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
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- 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)