Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9520/1
Permit type:	Purpose permit
Applicant name:	Regional Power Corporation t/a Horizon Power
Application received:	14 December 2021
Application area:	70 hectares of native vegetation
Purpose of clearing:	Installing an overhead transmission power line
Method of clearing:	Mechanical clearing
Property:	Lot 40 on Deposited Plan 241646, Lot 42 on Deposited Plan 241586, Lot 98 on Deposited Plan 238434, Lot 1556 on Deposited Plan 70856, Crown Reserve 9700, Lot 100 on Deposited Plan 238025, Lot 104 on Plan 220785, and Unallocated Crown Land (PIN 1004424)
Location (LGA area/s):	Shire of East Pilbara
Localities (suburb/s):	Pardoo and Marble Bar

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single contiguous area (see Figure 1, Section 1.5). The clearing is for the construction of a 43 kilometre (km) overhead single circuit 66 kV transmission line including fire protection zone and access tracks. The clearing will consist of up to 70 hectares within a 296 hectare footprint.

The line will run from the end of Horizon Power's Goldsworthy line to Fortescue Metal Group's (FMG) borefields located in the Pilbara Bioregion of Western Australia. The new supply system will provide reliable power to FMG. Electrical infrastructure and will include 21-metre-high single steel poles, overhead cable, electrical substation and associated infrastructure. Areas of temporary clearing will include but not limited to laydown (equipment and offices), driving over vegetation, pole site construction and winch sites (Horizon Power, 2021).

1.3. Decision on application

Decision:	Granted
Decision date:	31 August 2022
Decision area:	70 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 no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix H.1), flora and fauna surveys (including Greater Bilby targeted survey) (GHD, 2021) and a Targeted Significant Flora and Vegetation Survey (Ecologia, 2016) provided as additional information by the applicant (see Appendix F), 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) and actions taken by the applicant which resulted in the avoidance and minimisation of the extent of the clearing area and the mitigation of the impacts of clearing (see Section 3.1 of this report).

The Delegated Officer has determined that the proposed clearing of 70 hectares of native vegetation, is unlikely to result in significant residual environmental impacts.

However, the proposed clearing may result in the following:

- impacts to greater bilby and other terrestrial fauna should they occur within the application area at the time of clearing, and
- the potential introduction and spread of weeds into adjacent native vegetation

After considering the available information, the Delegated Officer determined that the following requirements will be conditioned on the clearing permit to manage and address the potential impacts of clearing:

- avoid and minimise measures to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- pre-clearance surveys to identify greater bilby within the application area, and the relocation of any individuals recorded.

The Delegated Officer considered that the impacts of the proposed clearing are unlikely to have any long-term adverse impacts on the environmental values in the local area and that the abovementioned management practices will adequately mitigate any potential impacts.

1.5. Site maps

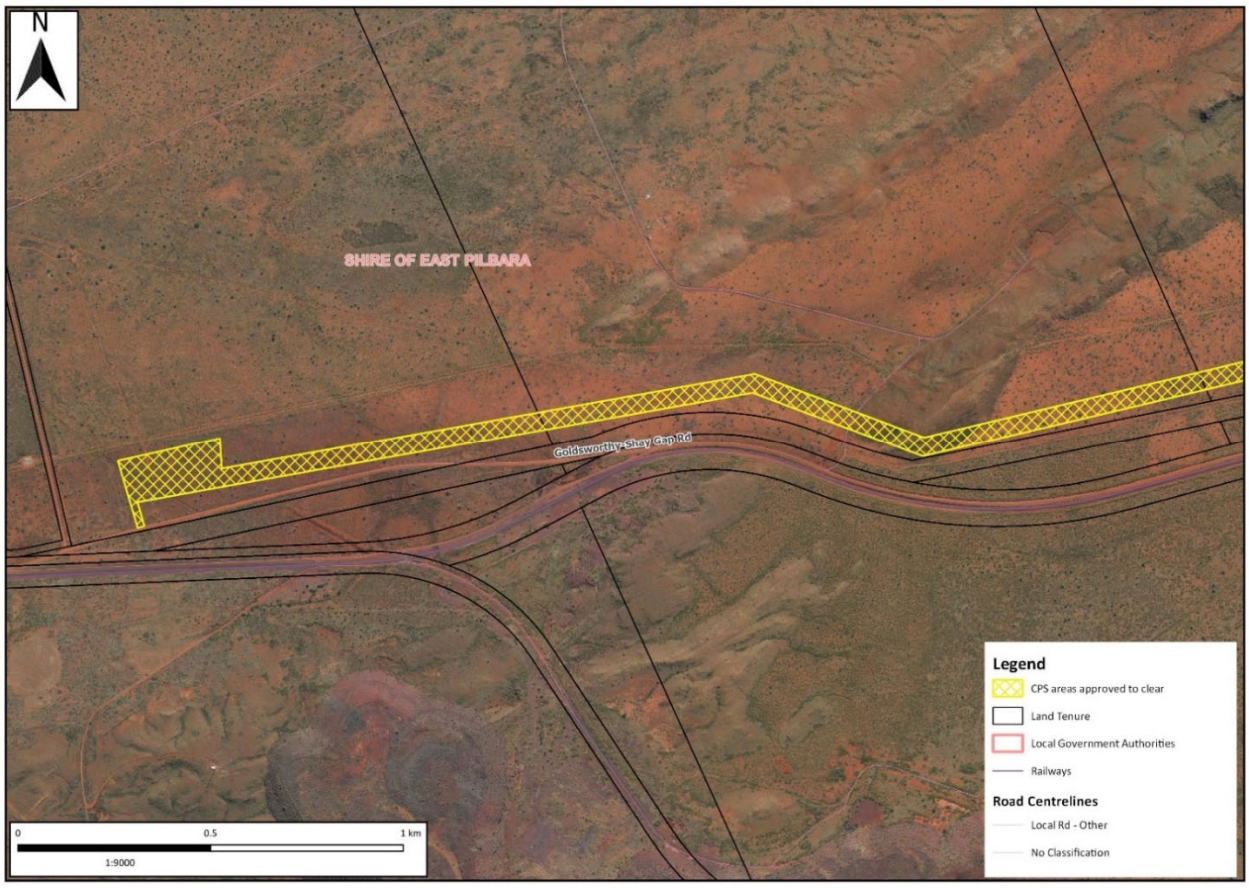


Figure 1 Map of the application area

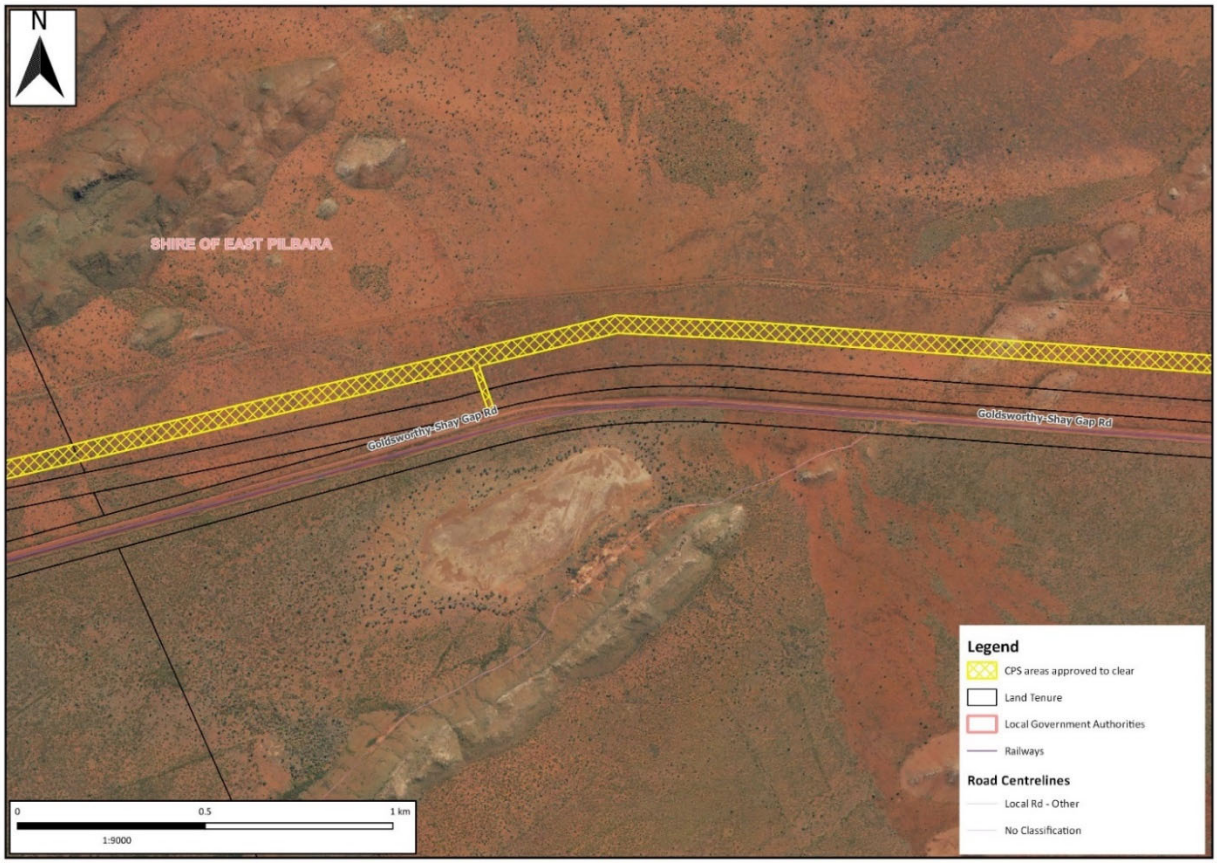


Figure 2 Map of the application area

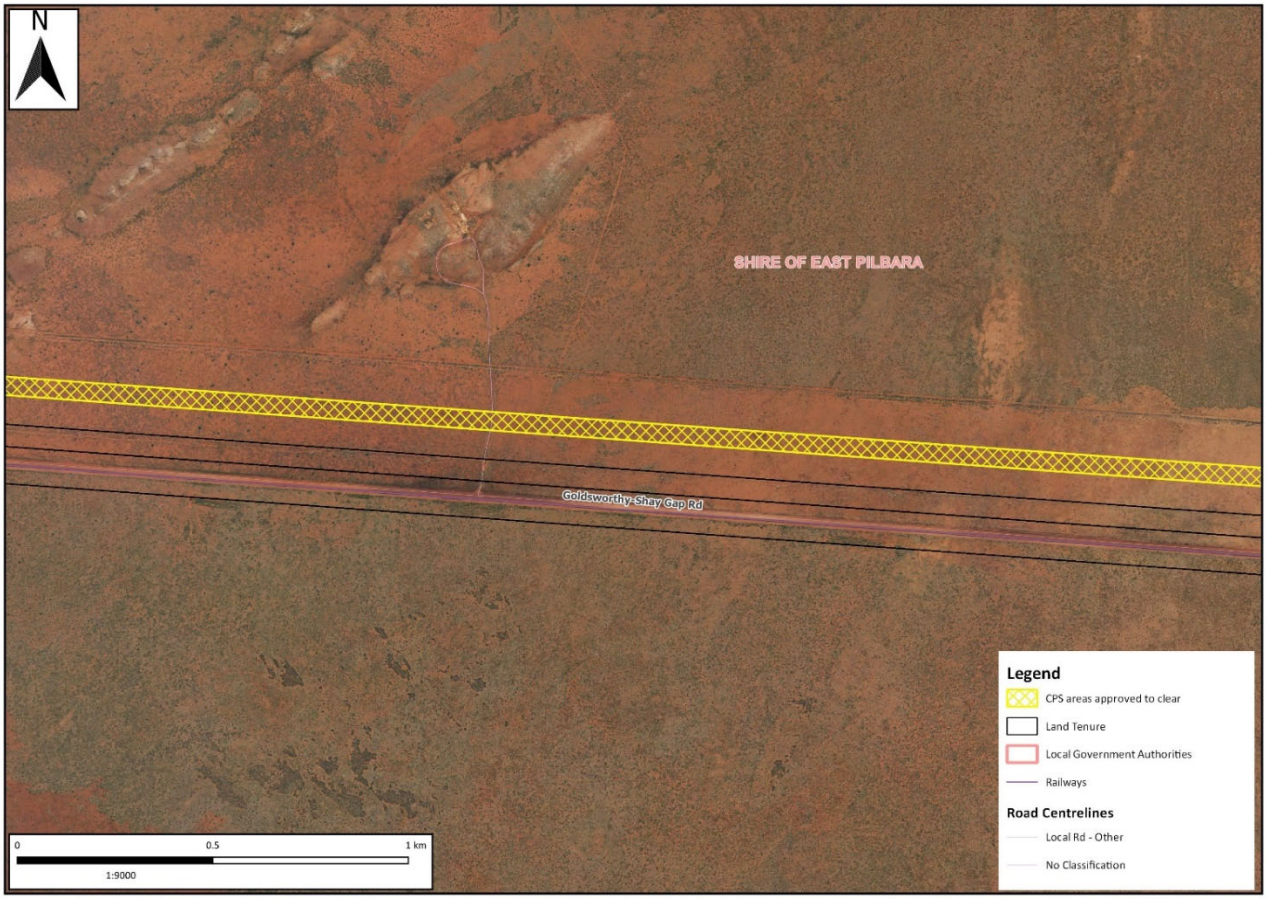


Figure 3 Map of the application area

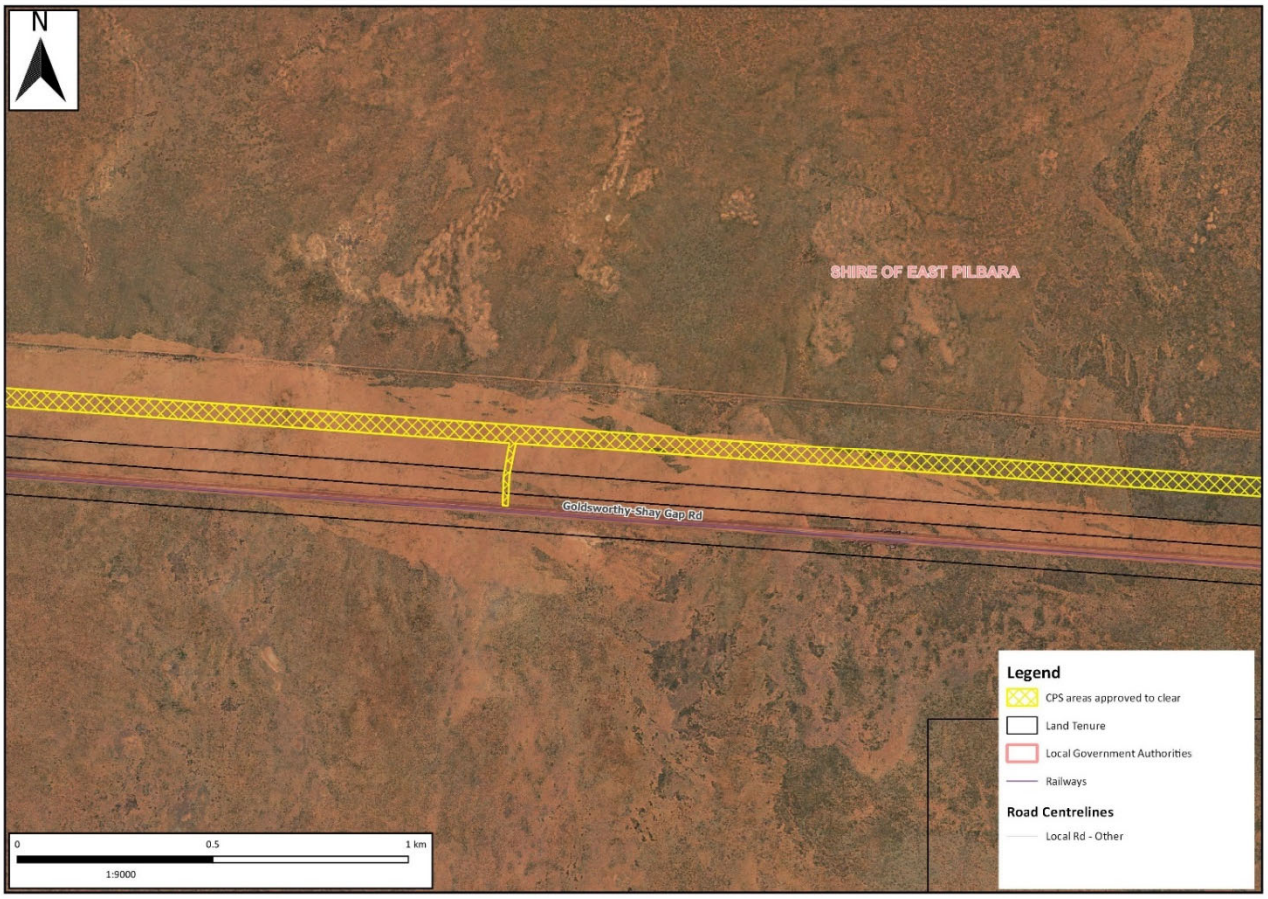


Figure 4 Map of the application area

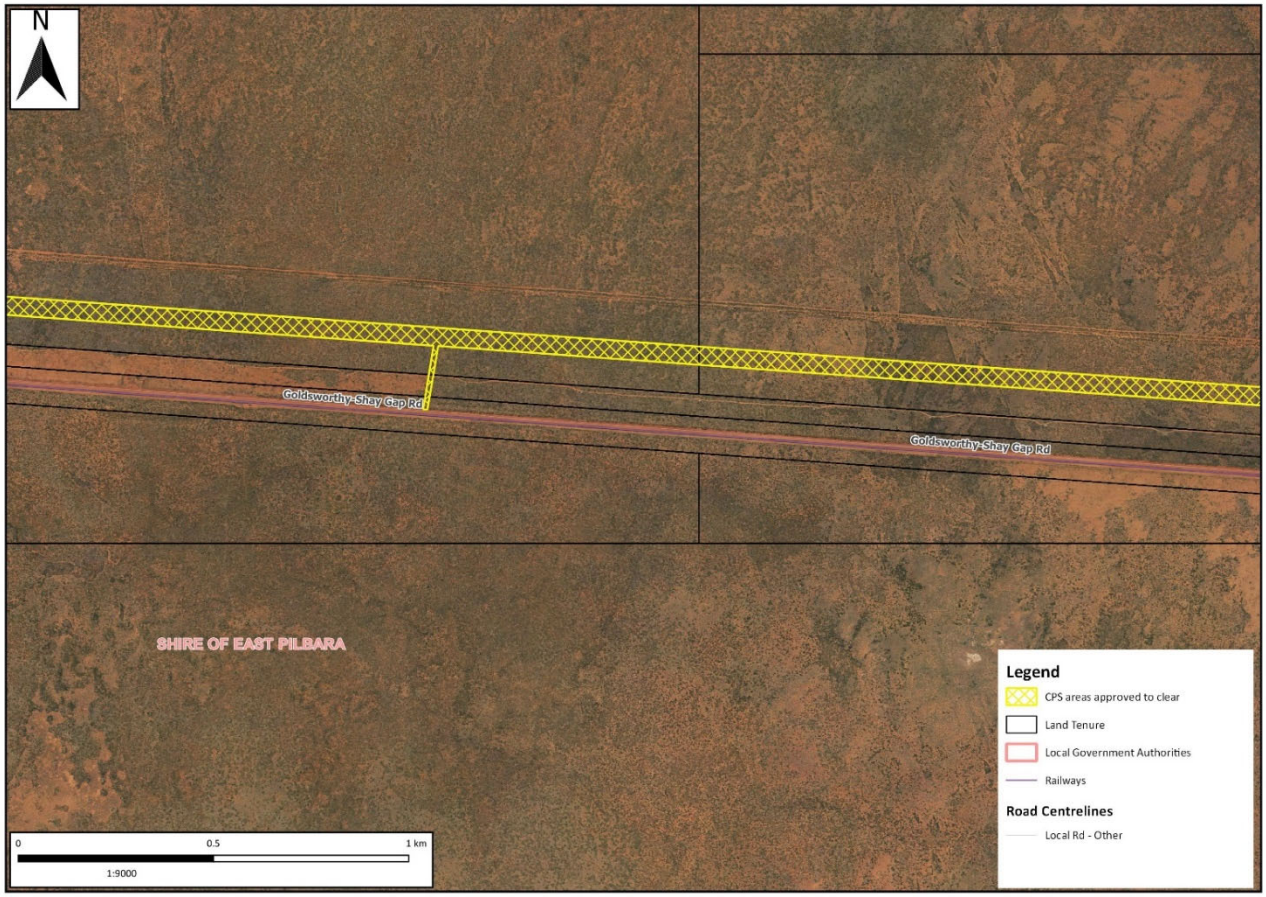


Figure 5 **Map of the application area**

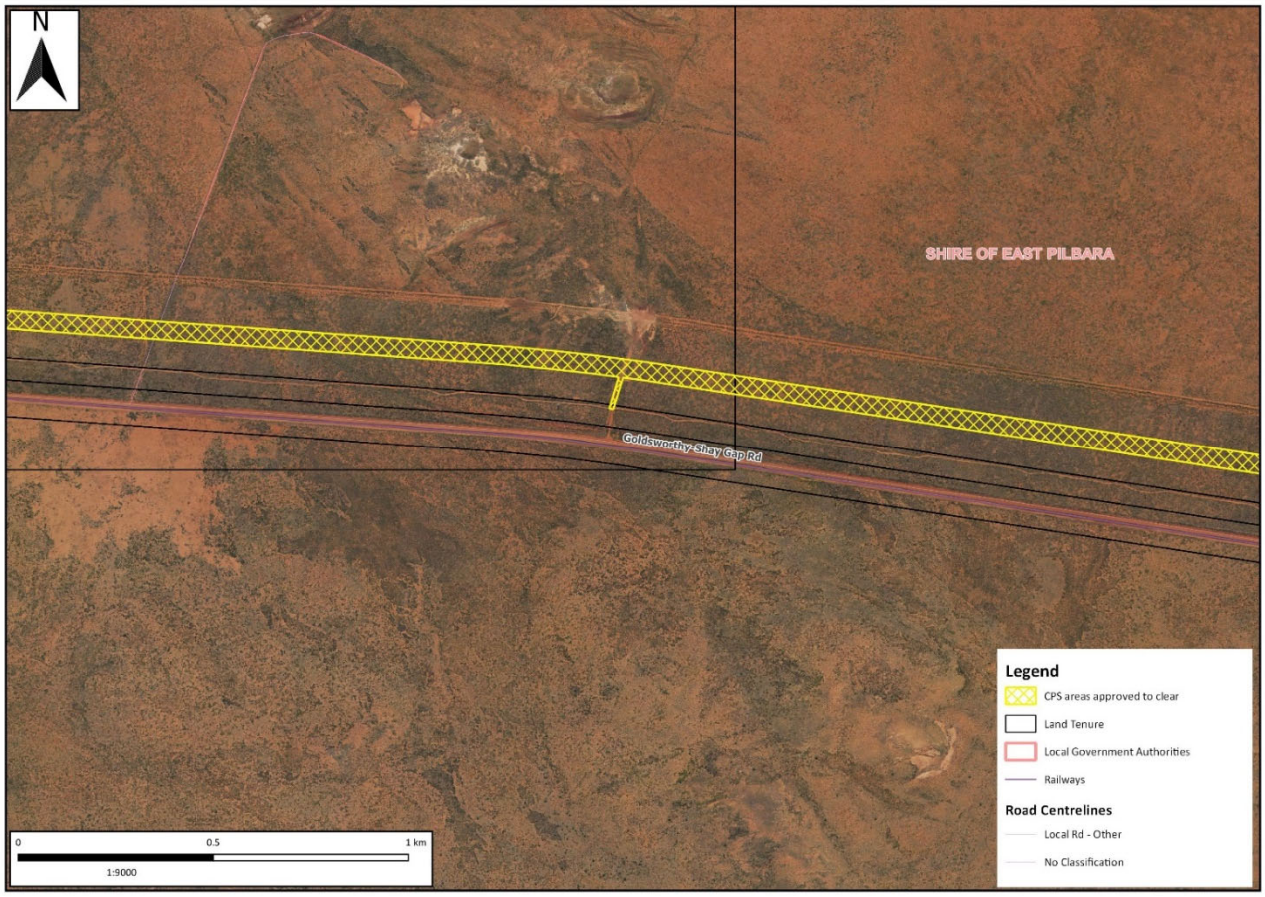


Figure 6 **Map of the application area**

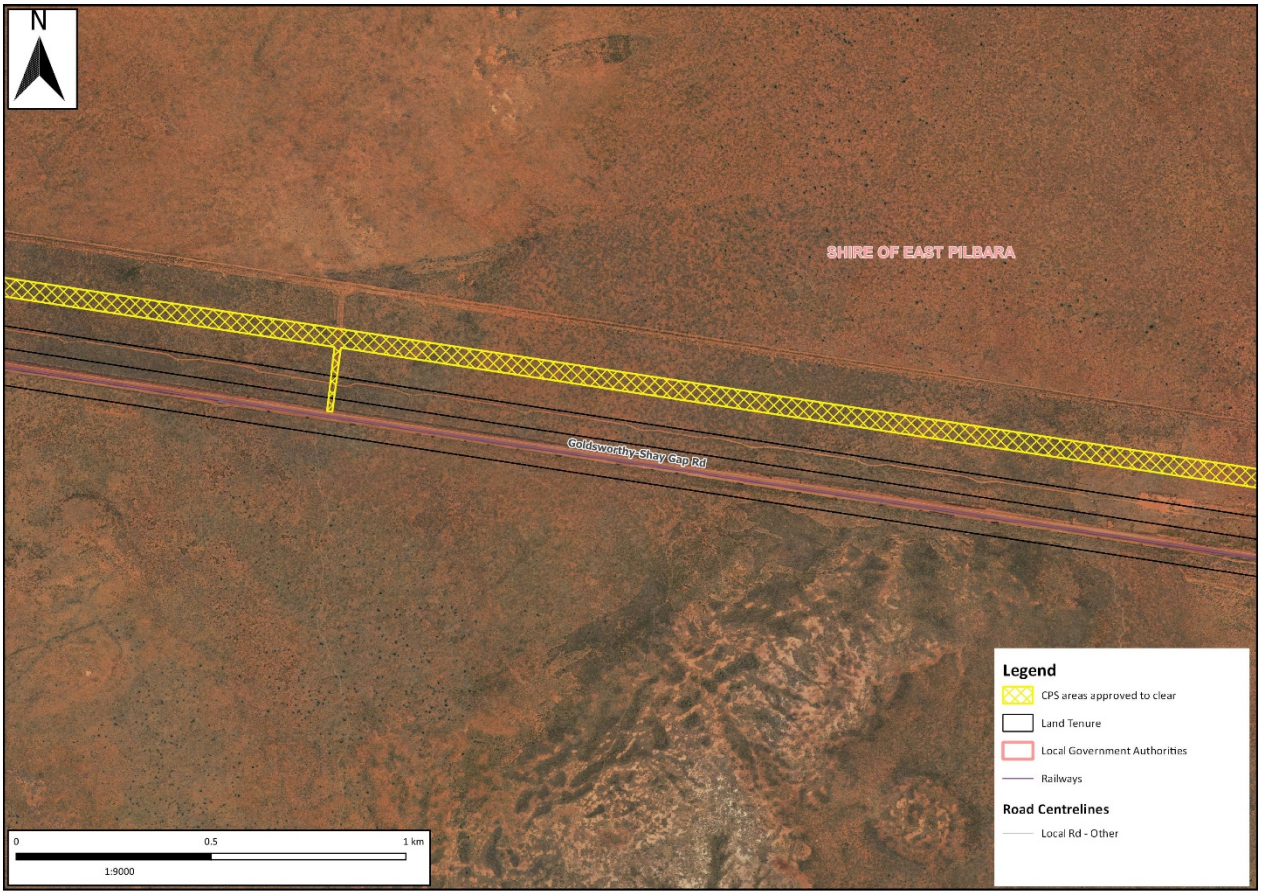


Figure 7 **Map of the application area**

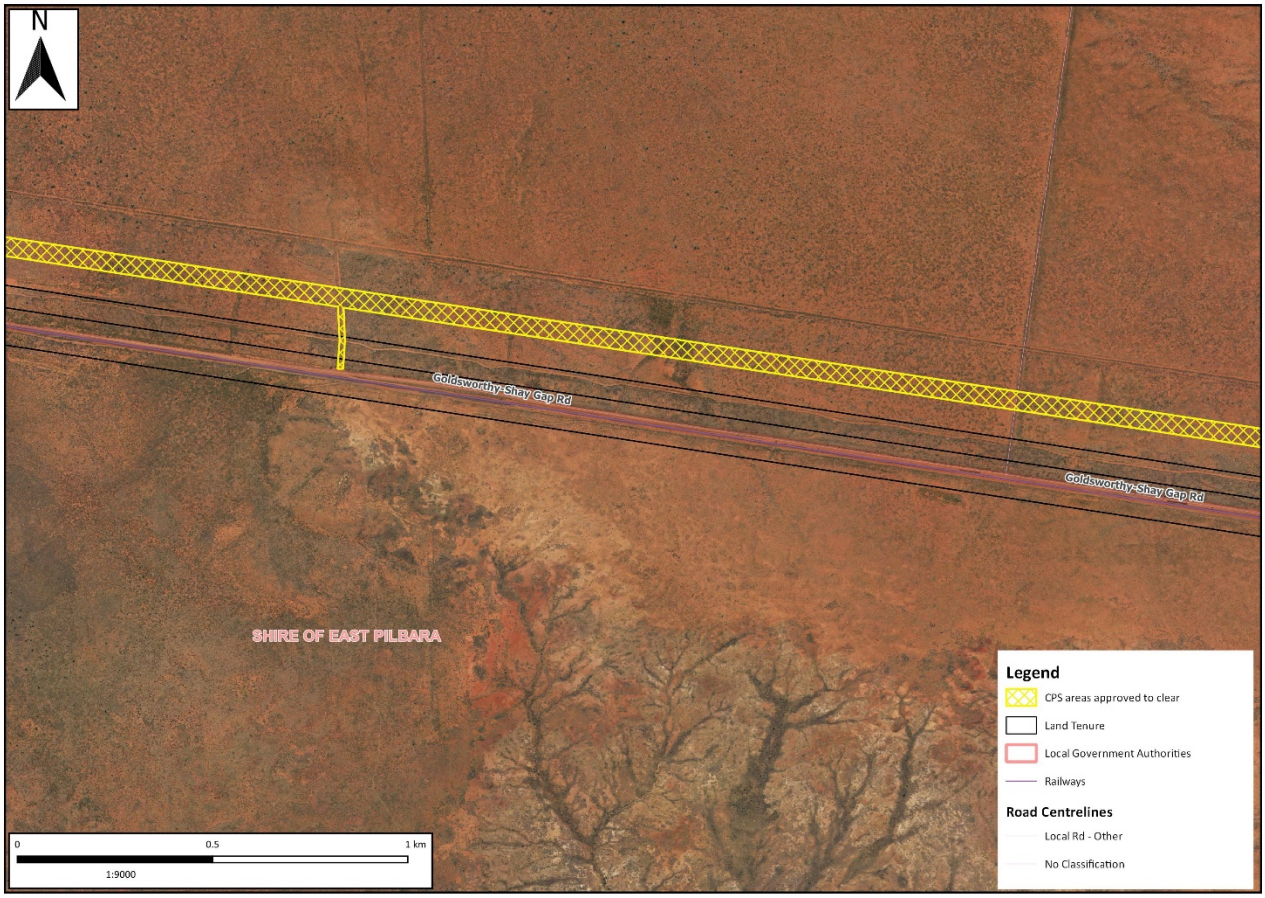


Figure 8 **Map of the application area**

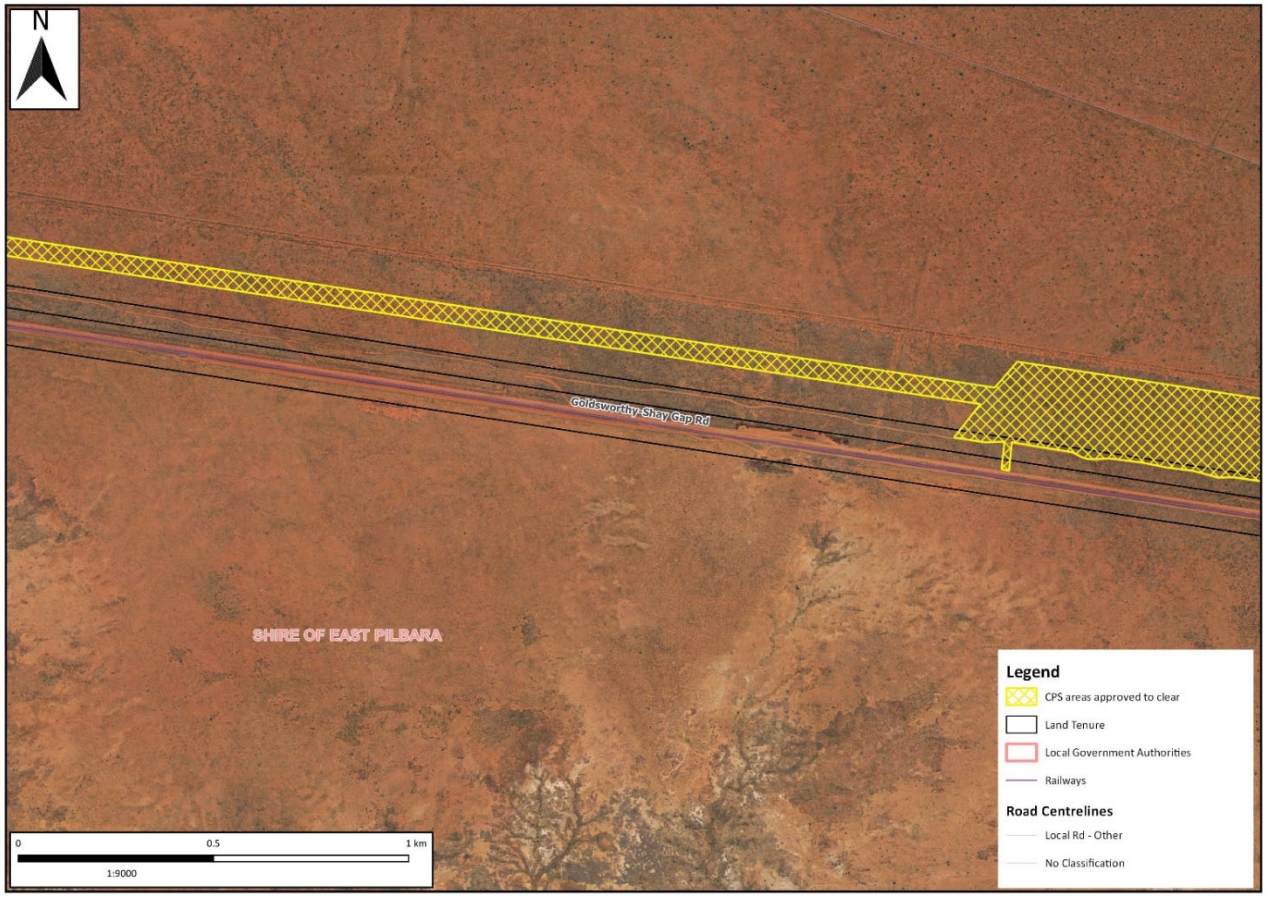


Figure 9 **Map of the application area**

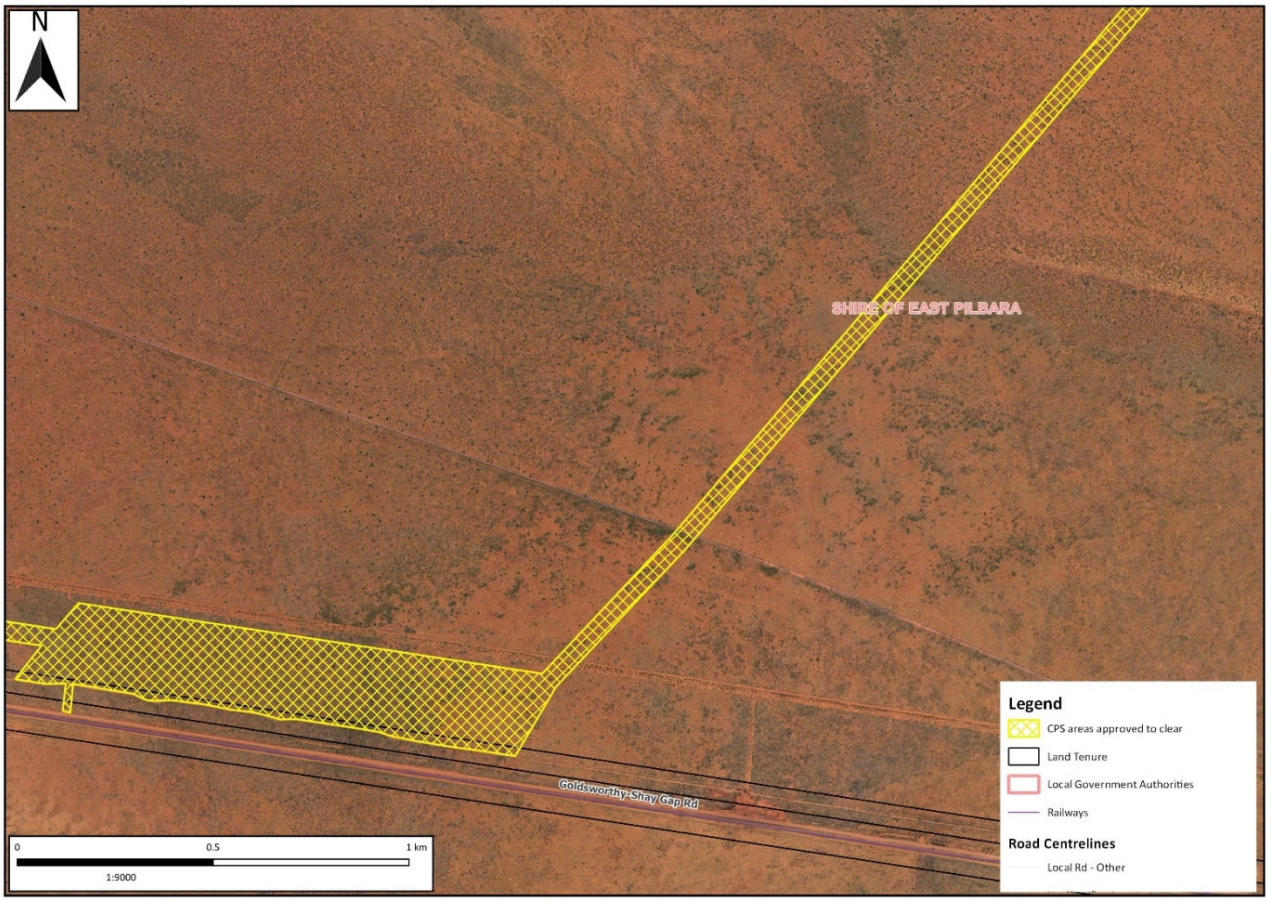


Figure 10 **Map of the application area**

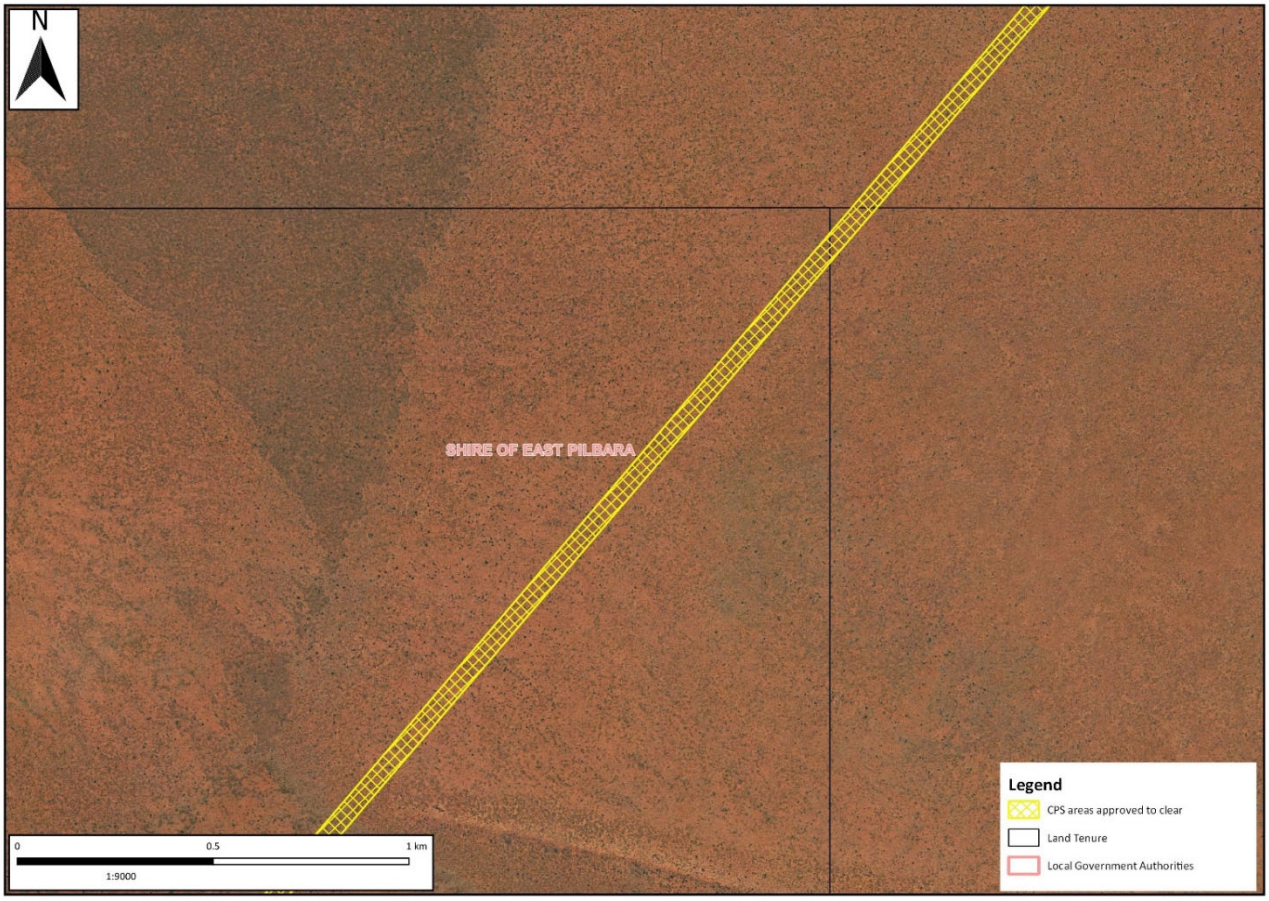


Figure 11 Map of the application area

Figure 12 Map of the application area

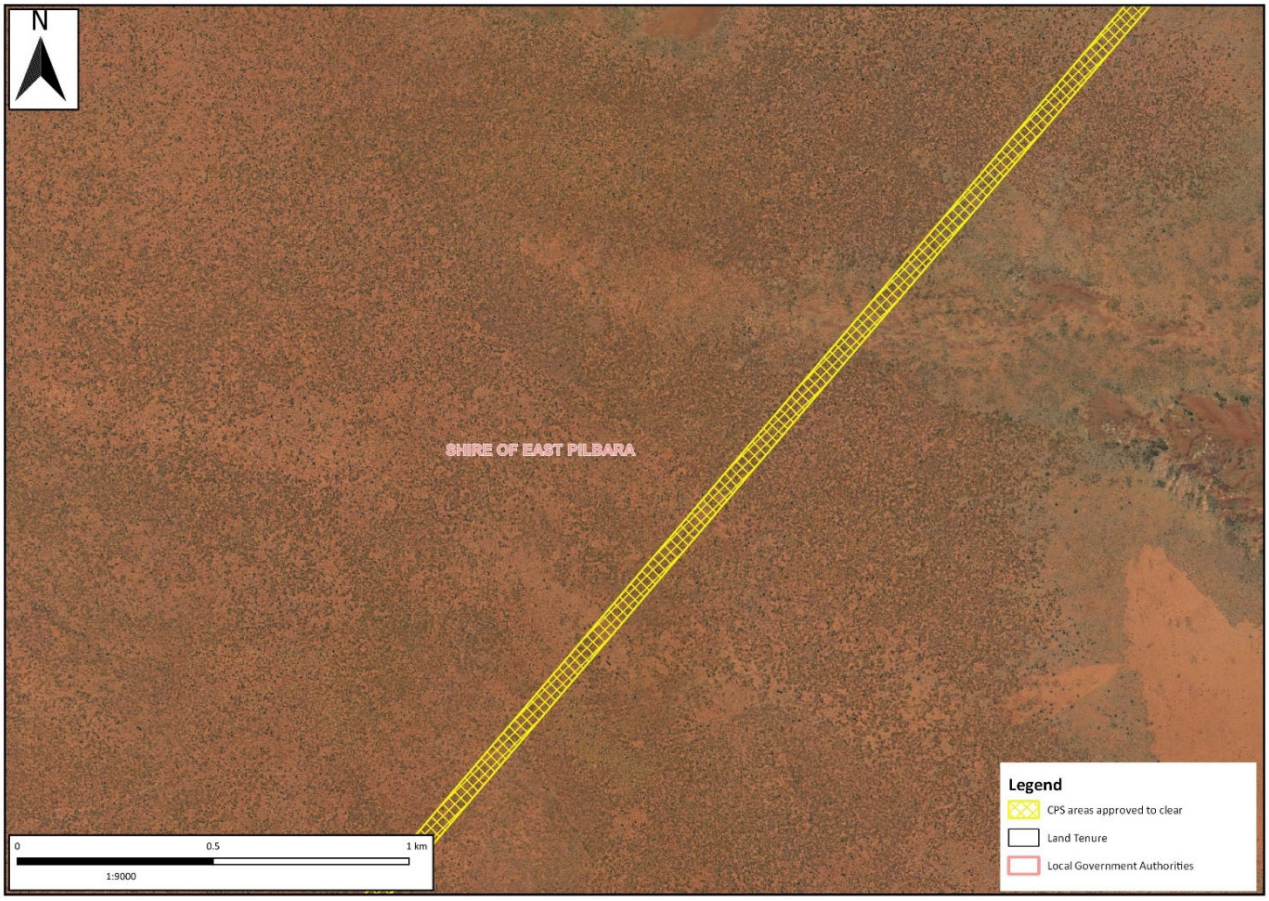


Figure 13 Map of the application area

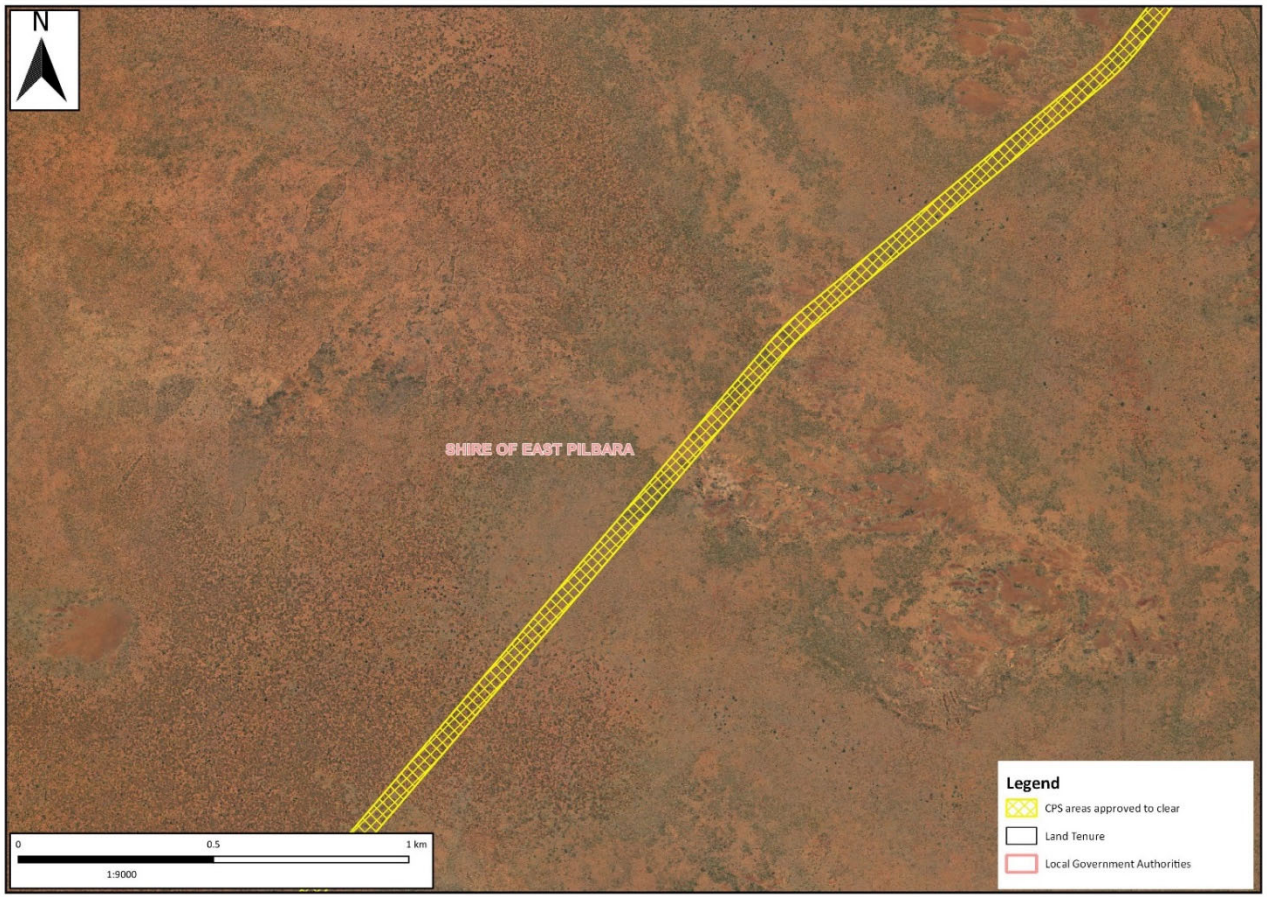


Figure 14 Map of the application area

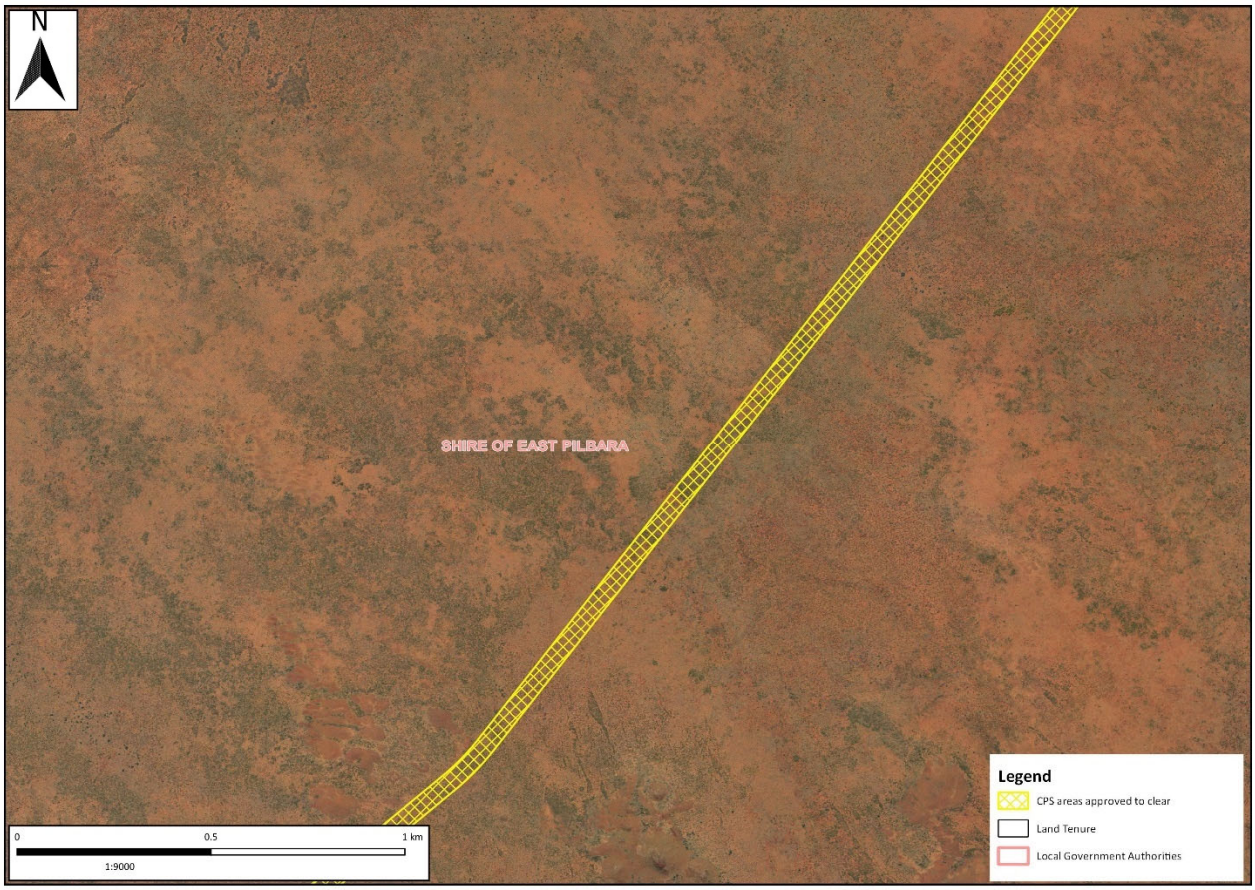


Figure 15 Map of the application area

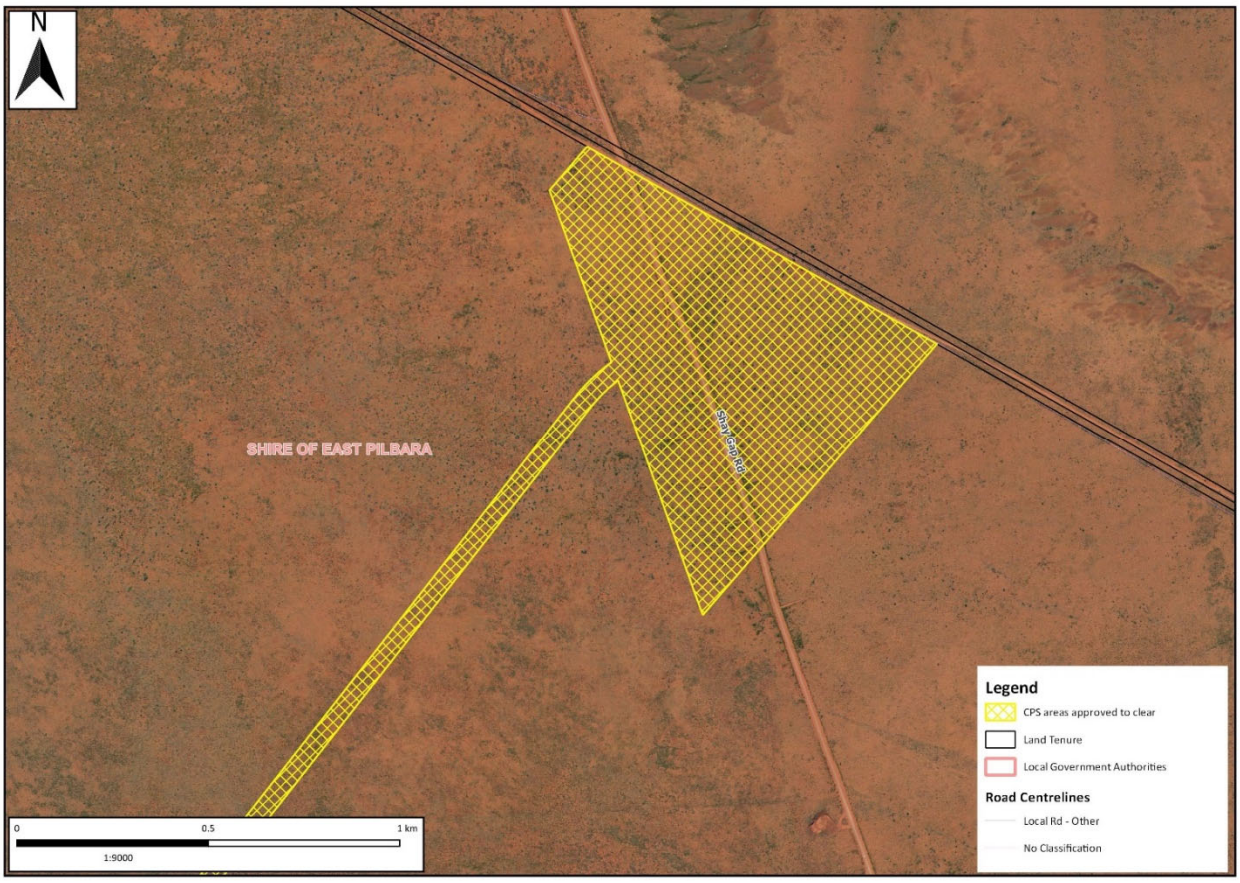


Figure 16 Map of the application area

The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

2 Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Aboriginal Heritage Act 1972*

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The applicant has selected the location of access tracks based on pre-existing tracks and disturbed areas from the existing transmission line to the south. It is noted that the existing transmission line in the area is privately owned and not accessible to Horizon Power. No feasible alternatives to the installation of an overhead transmission resulting in a lesser environmental impact were identified (Horizon Power, 2021).

The applicant has indicated that FMG intend on developing a worker's camp and processing facility in the most northern section of the application area. Areas of temporary disturbance that has planned future use by FMG will not be rehabilitated (Horizon Power, 2021).

To facilitate the rehabilitation of vegetation in areas of temporary disturbance, Horizon Power have indicated that they will strip and stockpile topsoil at the commencement of construction. The applicant will undertake rehabilitation in a staged approach, commencing rehabilitation as areas of construction are completed. Ground levels will be recontoured to natural condition where appropriate and soil compaction removed prior to the respread of topsoil. Clearing of vegetation will only be undertaken where absolutely necessary for the installation of structures. Existing access tracks will be utilised by vehicles and machinery wherever possible. Due to the low-lying nature of the vegetation, it is expected that vegetation between the poles (excluding permanent access tracks) will require minimal vegetation maintenance. Areas between poles and along access tracks will be narrow and linear in nature and it is expected to regenerate with no long-term impact to fauna habitat. It is noted that a higher clearing allowance has been requested to accommodate design and operational flexibility should ground issues (including heritage finds) be encountered in the field. It is expected that actual clearing will be significantly less than requested (Horizon Power, 2021).

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

3.2. Assessment of impacts on environmental values

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

The assessment identified that the clearing may pose a risk to the environmental values of biological diversity, fauna habitat and that these required further consideration. 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.

The local area is defined as within a radius of 50 kilometres of the application area.

3.2.1. Environmental value: biological values (diversity, fauna) – Clearing Principles (a and b)

Assessment

A single-season detailed and targeted flora and vegetation survey and basic and targeted fauna survey for the Borefields Network Connection survey area, which included the application area, was undertaken by GHD in June 2021, including a desktop review, fauna likelihood analysis, and a field assessment which involved a fauna habitat assessment and targeted searches for greater bilby (*Macrotis lagotis*) (GHD, 2021). The fauna survey identified four broad fauna habitats within the study area:

- Low *Acacia stelliceps* shrubland over *Triodia* hummock and tussock grassland on red sandy loam soil on flat plain
- *Eucalyptus* mallee over *Acacia* sp and *Melaleuca* sp open shrubland over hummock grassland on red sandy loam soil on plain to low rise between low rocky hills
- *Acacia* and *Grevillea* over hummock grassland on rocky low hills and slopes
- *Eucalyptus victrix* scattered trees over *Acacia* open shrubland over hummock grassland on red brown sandy loam on water gaining area on upper part of drainage flats.

The survey area is part of a larger continuous area sandplain and flat drainage system that extends throughout the surrounding area. The habitats within the survey area have a high degree of habitat connectivity with surrounding vegetation having similar or better condition vegetation (GHD, 2021).

With consideration of the site characteristics, the findings of the reconnaissance fauna survey (GHD, 2021), relevant datasets, and the habitat preferences and distribution of the identified species, 6 conservation significant fauna species recorded in the local area have the potential to occur within the area under application (GHD, 2021).

The application area is located along existing tracks, power lines and railway line and areas already authorized to be cleared for a different purpose (water pipeline to the FMG borefields) within the landscape. Impacts are not expected to be significant given the extent to be cleared within an extensive local and regional extent.

Fauna Habitat and Suitability

The following conservation significant fauna species (state listing shown below) have been identified as potentially occurring within the application area:

- greater bilby (*Macrotis lagotis*) (vulnerable)
- spectacled hare-wallaby (mainland) (*Lagorchestes conspicillatus leichardti*) (priority four)
- peregrine falcon (*Falco peregrinus*) (other specially protected fauna)
- grey falcon (*Falco hypoleucos*) (vulnerable)
- brush-tailed mulgara (*Dasycercus blythi*) (priority four)
- Northern short-tailed mouse, Lakeland Downs mouse, kerakenga (*Leggadina lakedownensis*) (priority four)

This assumption is based on the habitat requirements, distribution, mapped vegetation types and condition of the vegetation.

Greater bilby

The greater bilby is known from numerous records within the local area, the closest of which is 100 metres from the application area. Greater Bilby largely occupies three major vegetation types; open tussock grassland on uplands and hills, mulga woodland or shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas (Department of the Environment and Energy, 2016). The distribution of the greater bilby is highly fragmented in Western Australia (Pavey, 2006).

Secondary recent evidence of the Greater Bilby activity (foraging holes, burrows, scat) was recorded within the survey area (GHD, 2021). Greater Bilby have been well-recorded in the area and suitable habitat is present within the application area. As this species is a mobile species and may occupy various areas overtime (based on previous records) it its considered likely that the species may occur, particularly in areas immediately west and further east of Shay Gap Road given the proximity of known records, high mobility of the species and habitat suitability of the application area (GHD, 2021).

Spectacled hare-wallaby

The spectacled hare-wallaby has numerous records within the local area of which the closest is 1.7 kilometres from the application area. This species exists in patchily distributed populations within the Pilbara and Kimberley regions (Winter et al., 2016). This species occupies a wide variety of habitat types including open forests, open woodland, tall shrublands, tussock grasslands and hummock grasslands. In the drier southern parts of its range (Western Australia) it commonly occupies spinifex (*Triodia* sp.) sandplains interspersed with low shrubs and a diversity of soft grasses, sedges, or forb species (Winter et al., 2016).

While this species has not been recorded within the application area, it may transiently occur on site given the proximity of known records, high mobility of the species and habitat suitability of the application area.

Peregrine falcon, grey falcon

These species are all known from records in the local area and Grey Falcon was recorded at three locations, most likely the same two individuals (adult and juvenile) within the application area (GHD, 2021). Suitable breeding habitat for these species is not being cleared within the application area, however the vegetation within the application area provides suitable foraging habitat for these species and they may occur on an occasional basis.

The local area contains extensive areas of native vegetation which are likely to provide habitat of similar foraging value for these species. Noting the lack of suitable breeding habitat within the application area for these species, and that they are highly mobile and have large home ranges, the proposed clearing is not likely to impact on significant habitat for these species.

brush-tailed mulgara (*Dasycercus blythi*) and Lakeland Downs mouse (*Leggadina lakedownensis*)

The brush-tailed mulgara (*Dasycercus blythi*) (Priority 4) is a carnivorous marsupial associated with *Triodia* spinifex grasslands with medium to dense cover, while the crest-tailed mulgara typically occurs on sand dunes with a sparse cover of vegetation or in sparse herb lands and grasslands bordering salt lakes (CALM, 2002b). The species utilises extensive burrow systems with multiple entrances on sand dunes, typically at the base of grass clumps or bushes (CALM, 2002b). The Lakeland Downs mouse (*Leggadina lakedownensis*) (Priority 4) occupies *Acacia* shrublands and low shrubs on deep sandy soils (CALM, 2002a). The species is nocturnal, residing in burrows during the day and foraging on invertebrates and plant material at night (CALM, 2002a). It is considered that the shrubland and hummock grassland habitats within the application area may provide suitable habitat for these species. Although the application area may provide suitable habitat for these species, it is acknowledged that no evidence of burrows or significant habitat resources for these species were noted during the fauna survey (GHD, 2021). Further, the Acacia shrubland and hummock grassland habitats within the application area are highly represented in the local area and area adjacent to expansive tracts of native vegetation that are likely to contain similar quality habitats. The application is also adjacent to the existing and future approved infrastructure, which is likely to be subject to ongoing disturbance including noise, dust and wind exposure from use of the road and railway. Given the extent of the proposed clearing, the ongoing disturbance from use of adjacent existing infrastructure, and the extent of similar habitat types adjacent to the application area, it is not considered likely that the clearing proposed will result in impacts to locally or regionally significant habitat for the brush-tailed mulgara or Lakeland Downs mouse.

Conclusion

Based on the above assessment, the proposed clearing is unlikely to impact on significant habitat for any conservation listed fauna species. However, the proposed clearing may result in fauna fatalities should they occur within the application area at the time of clearing. Impacts to fauna are not expected to be significant given the small extent of vegetation to be cleared within an extensive local and regional extent and the fact that the clearing areas are concentrated along existing infrastructure. Conducting clearing in a slow, progressive manner from one direction to the other will allow any fauna present to move into adjacent native vegetation ahead of the clearing activity.

Conditions

To address the above impacts and reduce any potential risks to fauna, the clearing permit contains conditions that require the applicant to undertake the following management measures:

- slow, directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity
- identify, remove (if present), and relocate (if necessary) greater bilby from the application area to an area of suitable habitat

3.2.2. Environmental value: land resource – Clearing Principles (g)

The application area is mapped as Nita and Capricorn soil systems. The Nita soil system is prone to wind erosion if vegetation cover is removed. Based on the above, the proposed clearing is likely to cause appreciable land degradation in the form of wind erosion.

Outcome

To address the above impact, the clearing permit contains a condition that require the applicant to undertake the following management measure:

- Staged clearing

3.3. Relevant planning instruments and other matters

The proposed activities occur within the proclaimed Pilbara groundwater and surface water areas and are subject to licensing requirements under the *Rights in Water and Irrigation Act 1914 Act (RiWI)*. The proponent has a current 5C licence to take water (GWL175700(5) an entitlement of 20,000,000Kl for the purpose dust suppression for earthworks and construction purposes on mining tenement L45/320 which covers the clearing application area.

There are no minor creeks that run through application area therefore it is unlikely that a permit to modify banks will be required.

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

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. The proposed clearing area runs between the Goldsworthy-Shay Gap Road and an existing overhead transmission line for approximately 28 km in east-west direction, after which it branches off in a north-easternly direction along the North Star Magnetite Water Corridor (Ministerial Statement 993) for approximately 15 km towards the borefields. Spatial data indicates the local area (50-kilometre radius from the centre of the area proposed to be cleared) retains approximately 96.82 per cent of the original native vegetation cover.
Ecological linkage	No TEC or State-listed PEC within the survey area or desktop study area (GHD, 2021). One environmentally sensitive area, ESA no. 7214 (De Grey River) is located within the desktop study area approximately 24 km north of the application area.
Conservation areas	The nearest DBCA managed reserve the Eighty Mile Beach Marine Park, approximately 27 km northwest of the application area.
Vegetation description	Photographs, aerial photography and a survey included in the Targeted Significant Flora and Vegetation Survey for the FMG Iron Bridge (Aust) Pty Ltd for the North Star water corridor Ecologia, 2016) indicated that the vegetation within the north south section of the proposed clearing area consists of Hummock grasslands, shrub steppe; *Acacia pachycarpa* over soft spinifex. The Vegetation survey (GHD, 2021) of the east-west section of the application indicate the vegetation within the proposed clearing area consists of four vegetation types aligning with broad landforms were identified and described in the survey area, not including cleared areas for tracks: • VT01 – *Corymbia flavescens* and *Corymbia zygophylla* isolated trees over *Acacia tumida* var. *pilbarensis, Acacia ancistrocarpa* and *Grevillea wickhamii* subsp. *hispidula* open shrubland to sparse shrubland on red brown sandplain • VT02 – *Eucalyptus odontocarpa* isolated mallee over *Acacia tumida* var. *pilbarensis, Acacia ancistrocarpa* and *Grevillea wickhamii* subsp. *hispidula* open shrubland to sparse shrubland on red brown sandplain to low rise between low rocky hills • VT03 – *Corymbia opaca* scattered trees and *Eucalyptus odontocarpa* scattered mallee over *Acacia tumida* var. *pilbarensis, Acacia pruinosa* and *Acacia orthocarpa* open shrubland to sparse shrubland on red brown sandy loam on granite and quartz rocky low hills and slopes. Scattered *Melaleuca glomerata* are present through vegetation type. • VT04 – *Eucalyptus victrix, Corymbia opaca* and *Corymbia zygophylla* scattered trees over *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* open shrubland on red brown sandy loam on water gaining area on upper part of drainage flats. Scattered *Melaleuca glomerata* are present through vegetation type. The full survey descriptions and maps are available in Appendix F. This is consistent with the mapped vegetation types: • 101, which is described as Hummock grasslands, shrub steppe; Acacia pachycarpa over soft spinifex • 117, which is described as Hummock grasslands, grass steppe; soft spinifex • 93, which is described as Hummock grasslands, shrub steppe; kanji over soft spinifex

Characteristic	Details
	The mapped vegetation types retain approximately 96.82 per cent of the original extent (Government of Western Australia, 2019).
Vegetation condition	Vegetation survey (GHD, 2021) and (ecologia, 2016) indicate the vegetation within the proposed clearing area is in Excellent to Very Good (Trudgen, 1991) condition, described as: • 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. The full Trudgen (1991) condition rating scale is provided in Appendix E. The full survey descriptions and mapping are available in Appendix F.
Climate and landform	Mean maximum temperature of the area ranges from 40.8°C in December to 30.2°C in July, and the mean minimum temperature ranges from 33.7°C in December to 24.1°C in July. The mean annual rainfall is 316.9 mm (BoM 2021).
Soil description	The soil is mapped as *Nita and Capricorn*. Nita Sandplains supporting shrubby spinifex grasslands with occasional trees Quaternary eolian sand Depositional surfaces; level eolian sandplains and occasional linear dunes, isolated low hills and occasional stony or gravelly rises; no organised drainage features. Relief up to 15 m. Capricorn Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs Lower Proterozoic sandstone, greywacke, dolomite and shale. Erosional surfaces, ranges and hills with steep rocky upper slopes, more gently sloping stony footslopes, restricted stony lower plains and valleys; moderately spaced tributary drainage patterns. Relief up to 180 m
Land degradation risk	The Nita soil systems are prone to wind erosion if vegetation cover is removed.
Waterbodies	The desktop assessment and aerial imagery indicated that transects one minor non-perennial watercourse of the De Grey River system. One nationally important wetland, De Grey River, is located within approximately 11 km of the survey area. No Internationally (Ramsar) important wetlands are located within 20 km of the survey area.
Hydrogeography	The proposed clearing sites are within the Canning-Kimberley Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914*.
Flora	According to available datasets, there are records of 15 conservation significant (flora species (14 priority and 1 threatened species) within the local area (50 km radius). Of these, only one priority flora species may occur in the application area based on soil and vegetation type. Neither the vegetation survey (GHD, 2021) or the targeted significant flora and vegetation survey (ecologia, 2016) identified any EPBC Act or BC Act listed flora or priority flora listed by the DBCA within the application area.
Ecological communities	No TEC or State-listed PEC within the survey areas or desktop study area.
Fauna	According to available datasets, there are records of 59 conservation listed fauna species within the local area. Of these species, 2 are specially protected, 13 are marine species and 26 are migratory (mainly shore birds). A likelihood of analysis of the remaining species identified six species that may occur within the application area based on habitat suitability, as presented in section A.3 below Two significant fauna species were recorded during the survey (GHD, 2021): – Grey Falcon (*Falco hypoleucos*) listed as Vulnerable under the EPBC Act and BC Act.

Characteristic	Details
	– Greater Bilby (*Macrotis lagotis*) (secondary evidence) listed as Vulnerable under the BC Act and EPBC Act. The Grey Falcon was recorded at three locations, most likely the same two individuals (adult and juvenile). No other conservation listed fauna species listed under the EPBC Act and / or BC Act were recorded within the survey area.

A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Pilbara	17,808,657.04	17,731,764.88	99.57	1,801,714.98	10.12
Great Sandy Desert	29,538,799.43	29,535,810.52	99.99	1,020,661.82	3.46
Vegetation complex					
101	961510.35	961464.59	100.00	19904.57	2.07
117	550284.56	545218.37	99.08	18509.93	3.36
93	3043221.56	3039567.56	99.88	59536.96	1.96
Local area					
50km radius	1,110,041.30	1,074,712.45	96.82	-	-

*Government of Western Australia (2019)

A.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Dasycercus blythi (brush-tailed mulgara)	P4	Y	Y	21.93	21	Y
Falco hypoleucos (Grey falcon)	VU	Y	Y	3.63	3	Y
Falco peregrinus (Peregrine falcon)	OS	Y	Y	11.39	12	Y
Lagorchestes conspicillatus leichardti (Spectacled hare-wallaby (mainland))	P4	Y	Y	22.23	9	Y
Leggadina lakedownensis (Northern short-tailed mouse, Lakeland Downs mouse, kerakenga)	P4	Y	Y	28.23	14	Y
Macrotis lagotis (Bilby, dalgyte, ninu)	VU	Y	Y	13.99	9	Y

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		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The proposed clearing areas are not likely to contain locally or regionally significant flora or assemblages of plants and animals. The application areas: • have been confined to areas that are adjacent to impacted areas or previously disturbed and open areas • provides habitat for conservation significant fauna which has not been deemed significant in the local context • does not contain locally or regionally significant flora or assemblages of plants • does not resemble habitat for threatened or priority flora; and • does not contain native vegetation which represents a TEC or PEC.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The proposed clearing area provides habitat for conservation significant fauna. Noting the extent of native vegetation within the local area relative to the extent of vegetation proposed to be cleared, the application area is not likely to represent significant habitat for these species. The proposed mitigation measures would reduce the risk of any potential impacts on fauna species within the application area.	May be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The application area is unlikely to contain habitat for threatened flora species listed under the BC Act	Not likely to be at variance	No
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."* Assessment: The proposed clearing area does not contain species composition indicative of a TEC listed under the BC Act or EPBC Act. There are no known TEC's within the local area (GIS Database; GHD, 2021).	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The 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).	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
As shown in Appendix A, the mapped vegetation type, Bioregion and local area all retain much greater than the 30 per cent threshold. Therefore, the application area is not within an extensively cleared area.		
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: Given no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact on- or off-site hydrology and water quality.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Mapping indicates that the application area contains sandy soils, which have an increased risk of wind erosion. Staged clearing condition will mitigate this risk.	May be at variance	Yes Refer to Section 3.2.2, above.
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: Given no water courses are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality.	Not likely to be at variance	No
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The mapped soils, topographic contours and semi-arid climate in the surrounding area does not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.	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, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993

Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

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

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix F. Biological survey information excerpts

FMG Borefields Network Connection, Flora and fauna survey, GHD (2021)

Key findings

Flora and vegetation

Four vegetation types aligning with broad landforms were identified and described in the survey area, not including cleared areas for tracks.

Vegetation type	Vegetation Type Description	Extent (ha)	Sampling sites	Photograph
VT01	*Corymbia flavescens* and *Corymbia zygophylla* isolated trees over *Acacia tumida* var. *pilbarensis, Acacia ancistrocarpa* and *Grevillea wickhamii* subsp. *hispidula* open shrubland to sparse shrubland over *Acacia stellaticeps* and *Jacksonia acicularis* open shrubland over *Triodia schinzii* and *Triodia ?pungens* open hummock grassland over *Eriachne lanata, Eriachne ?obtusa* and *Eragrostis desertorum* open tussock grassland over *Bonamia erecta, Ptilotus astrolasius* and *Centipeda* sp.sparse forbland on red brown sandplain.	123.04	Bore_01, Bore_02, Bore_03	
VT02	*Eucalyptus odontocarpa* isolated mallee over *Acacia tumida* var. *pilbarensis, Acacia ancistrocarpa* and *Grevillea wickhamii* subsp. *hispidula* open shrubland to sparse shrubland over *Corchorus sidoides, Dodonaea coriacea* and *Jacksonia acicularis* open shrubland over *Triodia schinzii* and *Triodia ?pungens* open hummock grassland over *Eriachne ?obtusa* open tussock grassland over *Bonamia erecta, Ptilotus astrolasius* and *Centipeda* sp.sparse forbland on red brown sandplain to low rise between low rocky hills.	2.35	Bore_04	

Vegetation type	Vegetation Type Description	Extent (ha)	Sampling sites	Photograph
VT03	*Corymbia opaca* scattered trees and *Eucalyptus odontocarpa* scattered mallee over *Acacia tumida* var. *pilbarensis, Acacia pruinosa* and *Acacia orthocarpa* open shrubland to sparse shrubland over *Acacia spondylophylla* and *Corchorus incanus* open shrubland over *Triodia ?pungens* open hummock grassland over *Aristida holathera* var. *holathera* and *Eriachne ?obtusa* open tussock grassland over *Trigastrotheca molluginea, Trianthema pilosum* and *Bonamia erecta.* sparse forbland on red brown sandy loam on granite and quartz rocky low hills and slopes.	2.37	Bore_05, Bore_08	
VT04	*Eucalyptus victrix, Corymbia opaca* and *Corymbia zygophylla* scattered trees over *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* open shrubland over *Corchorus sidoides, Tephrosia* sp. Bungaroo Creek (M.E. Trudgen 11601) and *Jacksonia acicularis* open shrubland over *Triodia schinzii* and *Triodia ?pungens* open hummock grassland over *Aristida holathera* var. *holathera* and *Eragrostis desertorum* open tussock grassland over *Ptilotus astrolasius, Tephrosia* sp. D Kimberley Flora (R.D. Royce 1848) and *Bonamia erecta.* sparse forbland on red brown sandy loam on water gaining area on upper part of drainage flats. Scattered *Melaleuca glomerata* are present through vegetation type.	7.46	Bore_06, Bore_07	

The condition of vegetation within the survey area ranged from Excellent to Very Good. Native vegetation covered 135.23 ha and cleared areas 0.15 ha. The vegetation structure was intact with limited signs of cattle activity and a low number of introduced flora were recorded. The western end of the survey area had previous disturbance through cattle grazing and higher cover of introduced species *(*Cenchrus ciliaris*). There were limited number of tracks that dissected the survey area.

Vegetation condition	Extent in survey area (ha)	%
Excellent	123.11	90.97
Very Good	12.12	8.95
Good	-	-
Poor	-	-
Degraded	-	-
Completely Degraded	-	-
Total	135.23	

Seventy-seven flora taxa (including subspecies and varieties) representing 22 families and 45 genera were recorded from the survey area during the field survey. This total comprised 76 native species and 1 introduced flora taxa. None of the introduced/naturalised flora taxa identified during the survey are listed as a Declared Pest under the *Biosecurity and Management (BAM) Act 2007* or a Weed of National Significance (WoNS).

No EPBC Act or BC Act listed flora or priority flora listed by the DBCA were recorded from the survey area. The likelihood of occurrence assessment concluded that *Euphorbia clementii* (P3) may possibly occur based on the nearest record being within one km of the survey area and the presence of suitable habitat. Adequate search effort did not record the species. All other conservation listed taxa are unlikely to occur within the survey area based on lack of suitable habitat and/or adequate search effort.

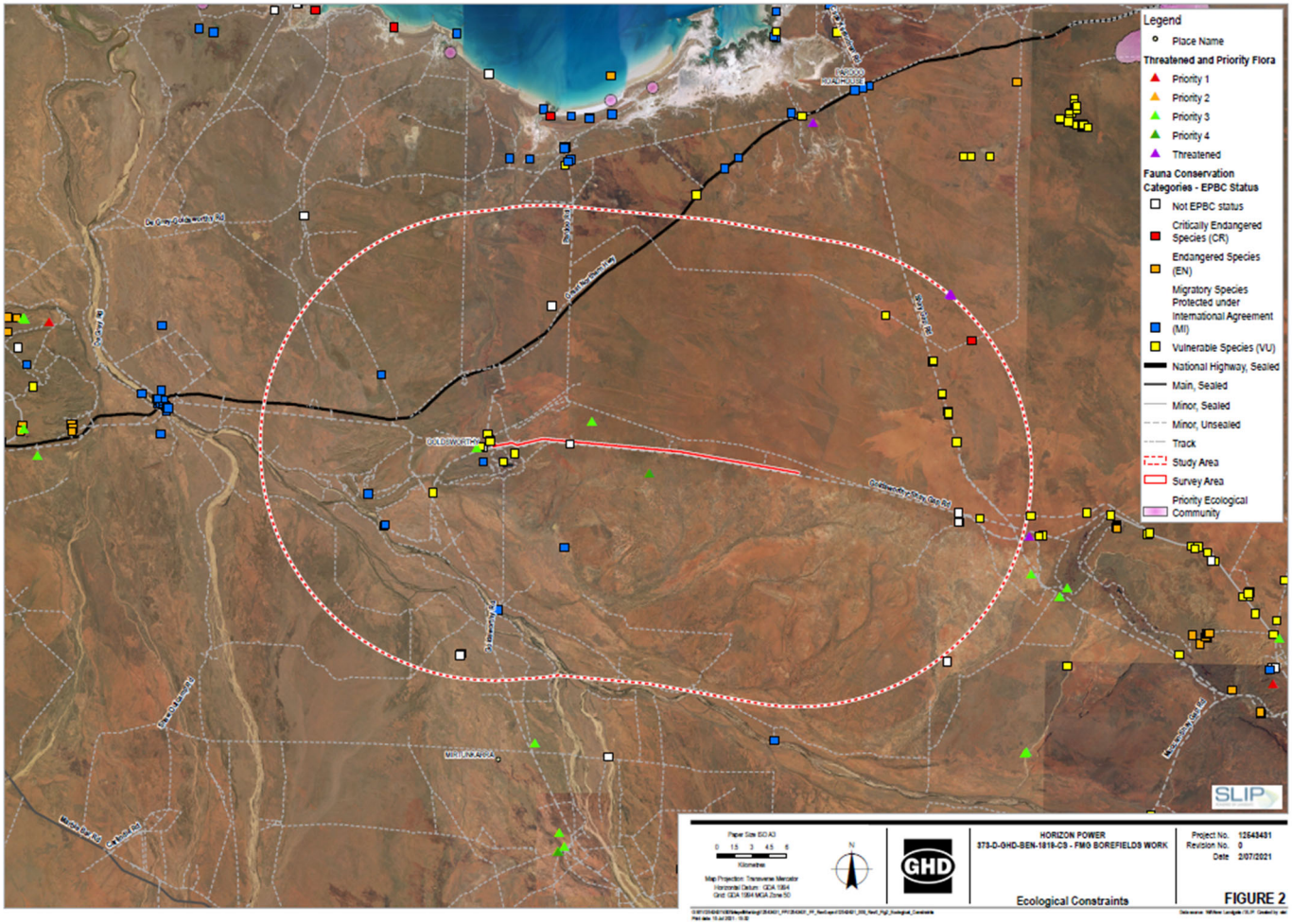
Fauna

The field survey recorded 55 vertebrate fauna species within the survey area. These comprise 35 birds from 25 different families, 12 reptiles from seven different families, and eight mammals from eight different families.

Two significant fauna species were recorded during the survey:

- Grey Falcon (*Falco hypoleucos*) listed as Vulnerable under the BC Act and EPBC Act
- Greater Bilby (*Macrotis lagotis*) listed as Vulnerable under the BC Act and EPBC Act (secondary recent evidence).

The proposed powerline development is not considered likely to have a significant impact on likely to occur conservation listed fauna species at a local and regional scale due to the high representation and continuation of available habitat in the region outside of the survey area. Future vegetation clearing should consider a fauna clearance survey to detect potentially new Bilby burrows that may have been established during the project environmental approvals timeframe.



Appendix H. Sources of information

H.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- 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)

H.2. References

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Department of Conservation and Land Management (CALM) (2002a) *Lakeland Downs short-tailed mouse, Leggadina lakedownensis (Watts, 1976)*. Department of Biodiversity, Conservation and Attractions, Perth, WA.

Department of Conservation and Land Management (CALM) (2002b) *Mulgara (Dasycercus sp.)*. Department of Biodiversity, Conservation and Attractions, Perth, WA.

Department of the Environment and Energy (DotEE) (2016). *Macrotis lagotis* in Species Profile and Threats Database, Department of the Environment, Canberra.

Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf.

Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development.* Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (accessed 10 March 2020).

Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Department of Water and Environmental Regulation (DWER) (Regulatory Services – Water) (2022) *Rights in Water and Irrigation Act 1914 advice for clearing permit application CPS 9520/1*, received 10 February 2022 (DWER Ref: DWERDT579205).

ECOLOGIA (2016) *FMG Iron Bridge (Aust) Pty Ltd North Star Water Corridor Targeted Significant Flora and Vegetation Survey* received 14 December 2021 (DWER Ref: DWERDT538212).

Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.

Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys.* Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.

GHD (2021) *FMG Borefields Network Connection, Flora and fauna survey,* received 14 December 2021 (DWER Ref: DWERDT538212).

Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019.* WA Department of Biodiversity, Conservation and Attractions. https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics

Pavey, C. (2006) National Recovery Plan for the Greater Bilby *Macrotis lagotis*. Northern Territory Department of Natural Resources, Environment and the Arts.

Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.

Regional Power Corporation trading as Horizon Power (2021) Clearing permit application CPS 9520/1, received 14 December 2021 (DWER Ref: DWERDT538212).

Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and output*s Resource Management Technical Report No. 280. Department of Agriculture.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed 10 February 2022)

Winter, J., Woinarski, J. & Burbidge, A. (2016) *Lagorchestes conspicillatus*. The IUCN Red List of Threatened Species 2016: e.T11161A21954319. Accessed 10 June 2022.