GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 6687/2
Permit Holder:	IB Operations Pty Ltd
Duration of Permit:	26 December 2015 – 26 December 2025

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 for the purpose of upgrading roads.

2. **Land on which clearing is to be done**
   Lot 228 on Deposited Plan 238638, Marble Bar
   Crown Reserve 12805, Marble Bar
   Wodgina Road reserve, Marble Bar (PIN 11734389)
   Pippingarra Road reserve, Marble Bar (PIN 12418060 and PIN 12418059)

3. **Area of Clearing**
   The Permit Holder must not clear more than 20 hectares of native vegetation within the areas cross-hatched yellow on attached Plan 6687/2a and Plan 6687/2b.

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:
   (a) avoid the clearing of native vegetation;
   (b) minimise the amount of native vegetation to be cleared; and
   (c) reduce the impact of clearing on any environmental value.

6. **Weed control**
   When undertaking any clearing or other activity authorised under 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. Record keeping

The Permit Holder must maintain the following records in relation to the clearing of native vegetation authorised under this Permit:

(a) 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;
(b) the date(s) that the area was cleared;
(c) the size of the area cleared (in hectares);
(d) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 5 of this Permit; and
(e) actions taken to minimise the risk of the introduction and spread of *weeds* in accordance with condition 6 of this Permit.

8. Reporting

The Permit Holder must provide to the *CEO* the records required under condition 7 of this Permit, when requested by the *CEO*.

Definitions

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

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

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

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;

weed/s means any plant -

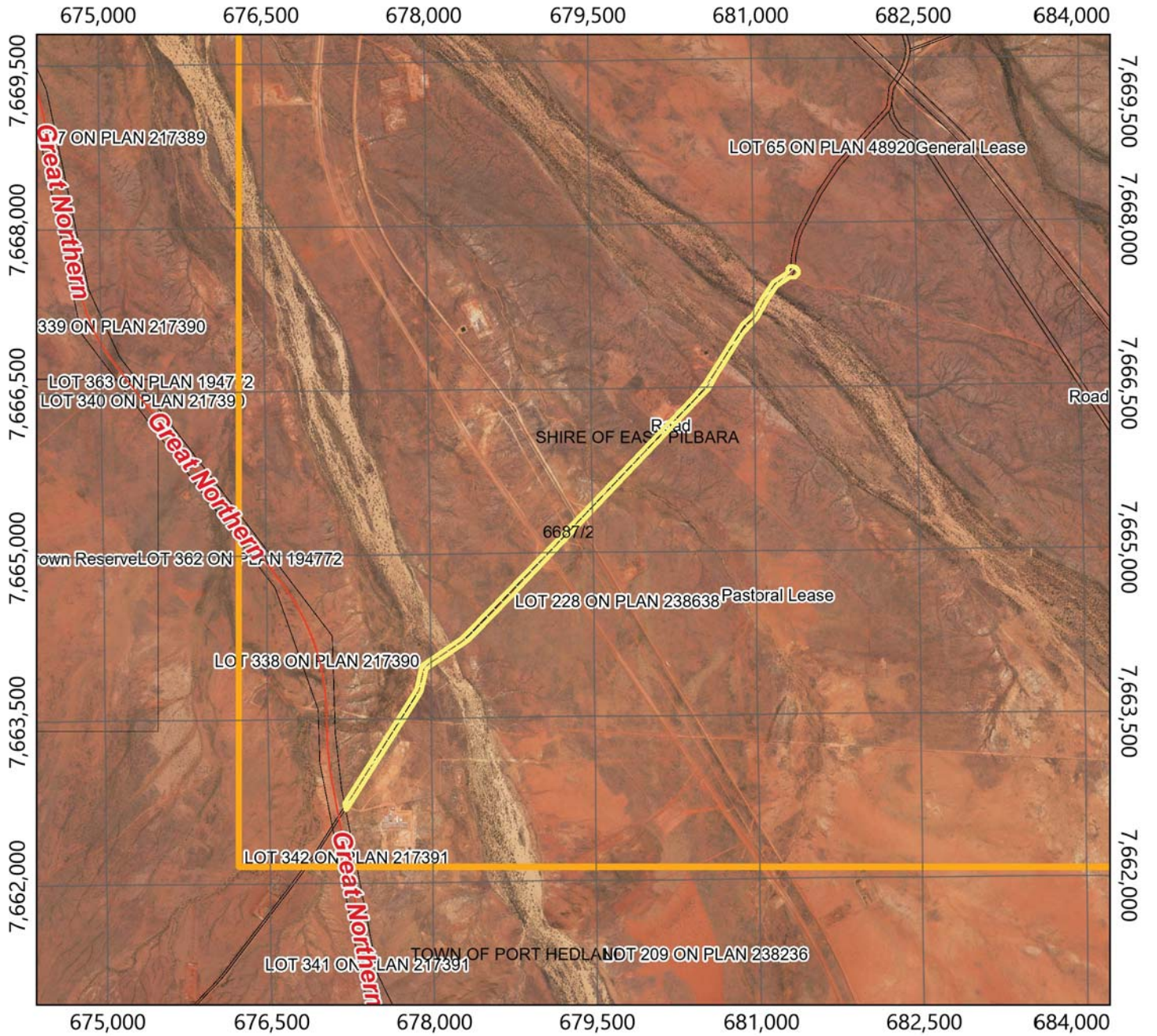
(a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
(b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or
(c) not indigenous to the area concerned.

Meenu Vitarana
A/MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

10 December 2020

Plan 6687/2a



Legend

- CPS areas approved to clear
- Roads - State Roads
- Roads - Major Roads
- Local Government Authorities
- Cadastre

1.5 0.75 1.5 Kilometers

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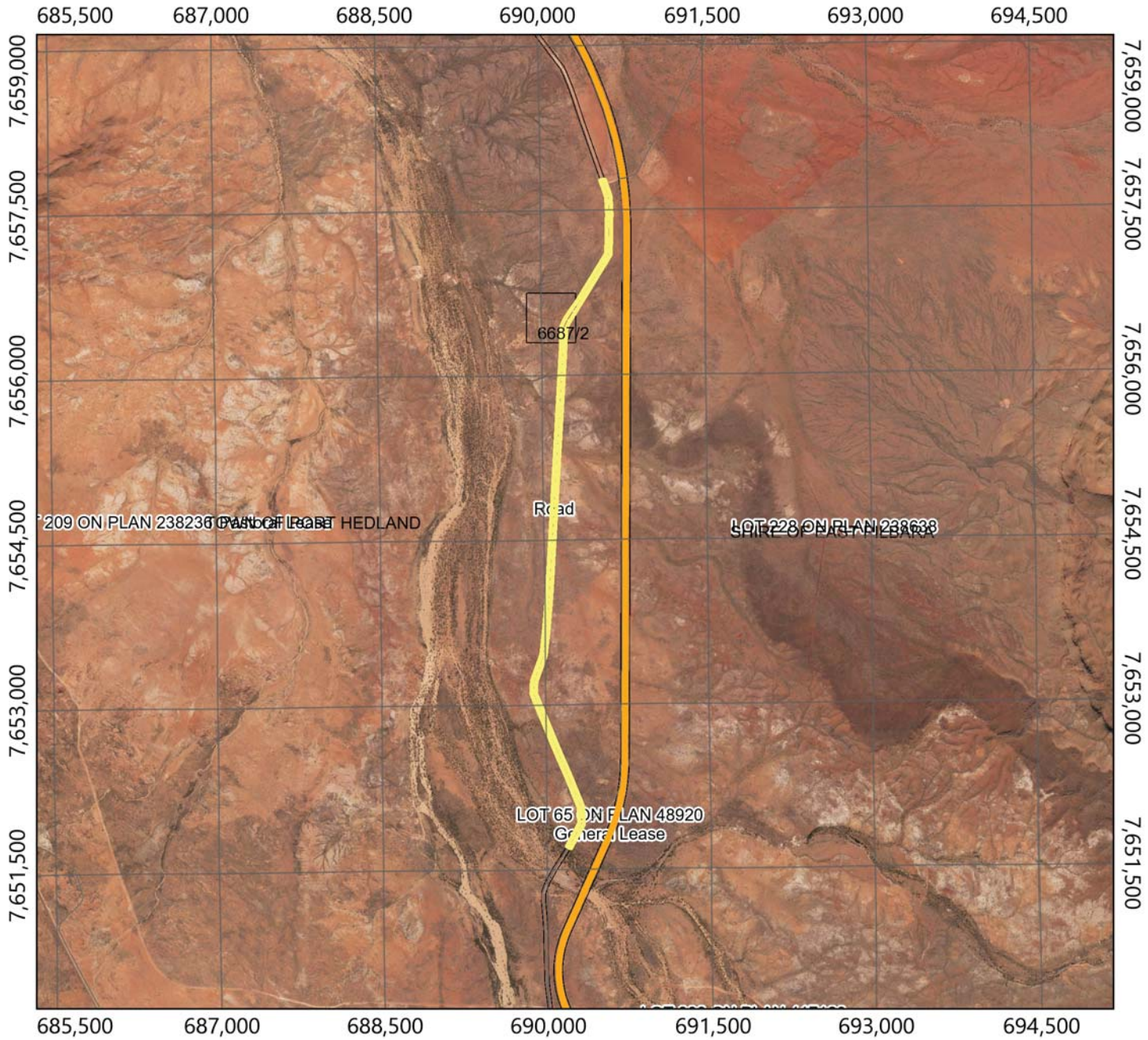
Officer with delegated authority under Section 20 of the Environmental Protection Act 1986.

Locality Map

Government of Western Australia
Department of Water and Environmental Regulation

Plan 6687/2b



Legend

- CPS areas approved to clear
- Roads - State Roads
- Roads - Major Roads
- Roads - Minor Roads
- Local Government Authorities
- Cadastre

1.5 0.75 1.5 Kilometers

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Officer with delegated authority under Section 20 of the Environmental Protection Act 1986.

Locality Map

Government of Western Australia
Department of Water and Environmental Regulation

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 6687/2
Permit type:	Purpose permit
Applicant name:	IB Operations Pty Ltd
Application received:	10 September 2020
Application area:	20 hectares of native vegetation
Purpose of clearing:	Road upgrades
Method of clearing:	Mechanical
Property:	Lot 228 on Deposited Plan 238638 Crown Reserve 12805 Wodgina Road reserve (PIN 11734389) Pippingarra Road reserve (PIN 12418060 and PIN 12418059)
Location (LGA area/s):	Town of Port Hedland and Shire of East Pilbara
Localities (suburb/s):	Marble Bar

1.2. Description of clearing activities

This amendment is to increase the permit duration for CPS 6687/1 by an additional five years. It is noted that clearing permit 6687/1 was for the purpose of upgrading and maintaining existing roads to allow for the transportation of prefabricated modules from Port Hedland to Iron Bridge mine site, however clearing under 6687/2 will be undertaken for the purpose of maintaining the existing road and verge vegetation (Fortescue Metals Group, 2020).

The footprint comprises 59.831 hectares distributed across two separate areas. The northern area consists of an approximately 50 metre wide, 6.5 kilometre long portion of Wodgina Road reserve and neighbouring properties and contains an approximately 20 m wide area previously cleared for the existing road (Figure 1). The southern area consists of an approximately 40 metre wide, 6.3 kilometre long portion of Pipingarra Road reserve and contains an approximately 10 metre wide cleared area for the existing road (Figure 2). The Pipingarra road portion of the clearing footprint granted under this amendment is slightly different to the area granted under CPS 6687/1, and extends further north, but not as far south, as requested by the applicant.

Clearing permit 6687/2 authorises 20 hectares of clearing within the above described footprint from 26 December 2015 to 26 December 2025, of which, available imagery indicate approximately 14 hectares has already been cleared under CPS 6687/1.

1.3. Decision on application

Decision:	Granted
Decision date:	10 December 2020
Decision area:	20 hectares of native vegetation as depicted in Section 1.5 below.

1.4. Reasons for decision

This clearing permit amendment 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 14 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 E), the findings of flora and fauna surveys, the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that the majority of clearing authorised under this permit has already been undertaken under Clearing Permit CPS 6687/1.

The assessment has not changed since the assessment for CPS 6687/1, except in the case of principle (a) and principle (c) due to updated conservation significant flora and fauna information. The assessment identified that the proposed clearing footprint:

1. may provide habitat for several conservation significant fauna species, including threatened species *Liasis olivaceus barroni* (Pilbara olive python), *Macroderma gigas* (Ghost bat), *Macrotis lagotis* (Bilby, dalgyte, ninu), *Dasyurus hallucatus* (Northern quoll) and *Falco hypoleucos* (Grey falcon), however given the nature of the proposed clearing and the presence of suitable habitat within the largely uncleared local area, the proposed clearing is unlikely to have significant impacts to these species;
2. may contain priority flora species, however given the nature of the proposed clearing and the relatively large number of records for each of these species, it is considered that even if these species were present within the application area, the impact to the conservation status of these species from the proposed clearing is likely to be minimal;
3. is unlikely to contain threatened flora species, including *Quoya zonalis K.A.Sheph. & Hislop (Pilbara Foxglove);*
4. intersects the Turner River and numerous minor, non-perennial watercourses, however, given the nature of the proposed clearing, potential impacts to surface water quality from the clearing are likely to be minimal.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures, the Delegated Officer determined that the impacts of the proposed clearing could be minimised and managed to be environmentally acceptable. The Delegated Officer decided to grant a clearing permit subject to conditions to:

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

1.5. Site maps

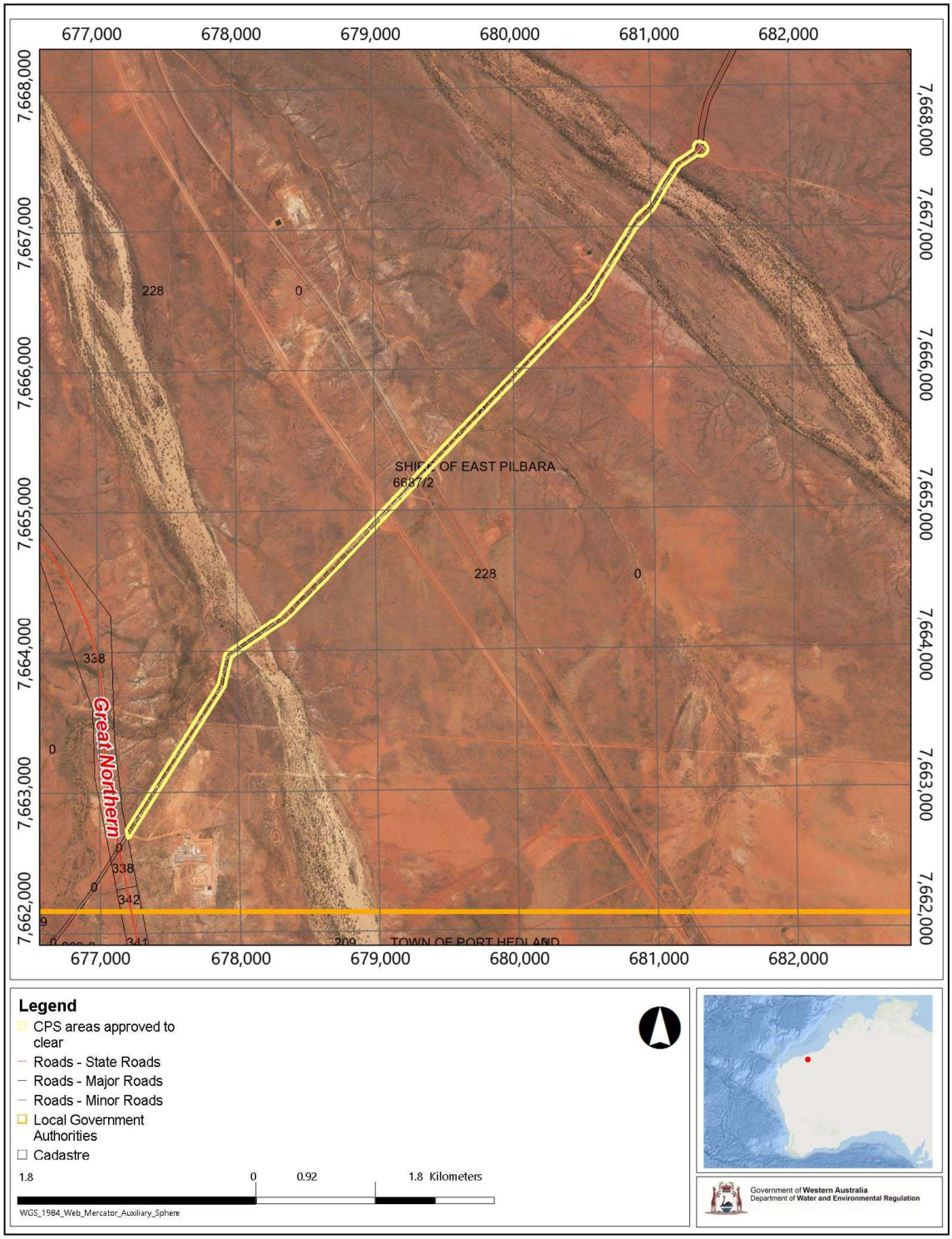

Figure 1 - Map 1 of 2 of the application area (Wodgina Road portion). The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

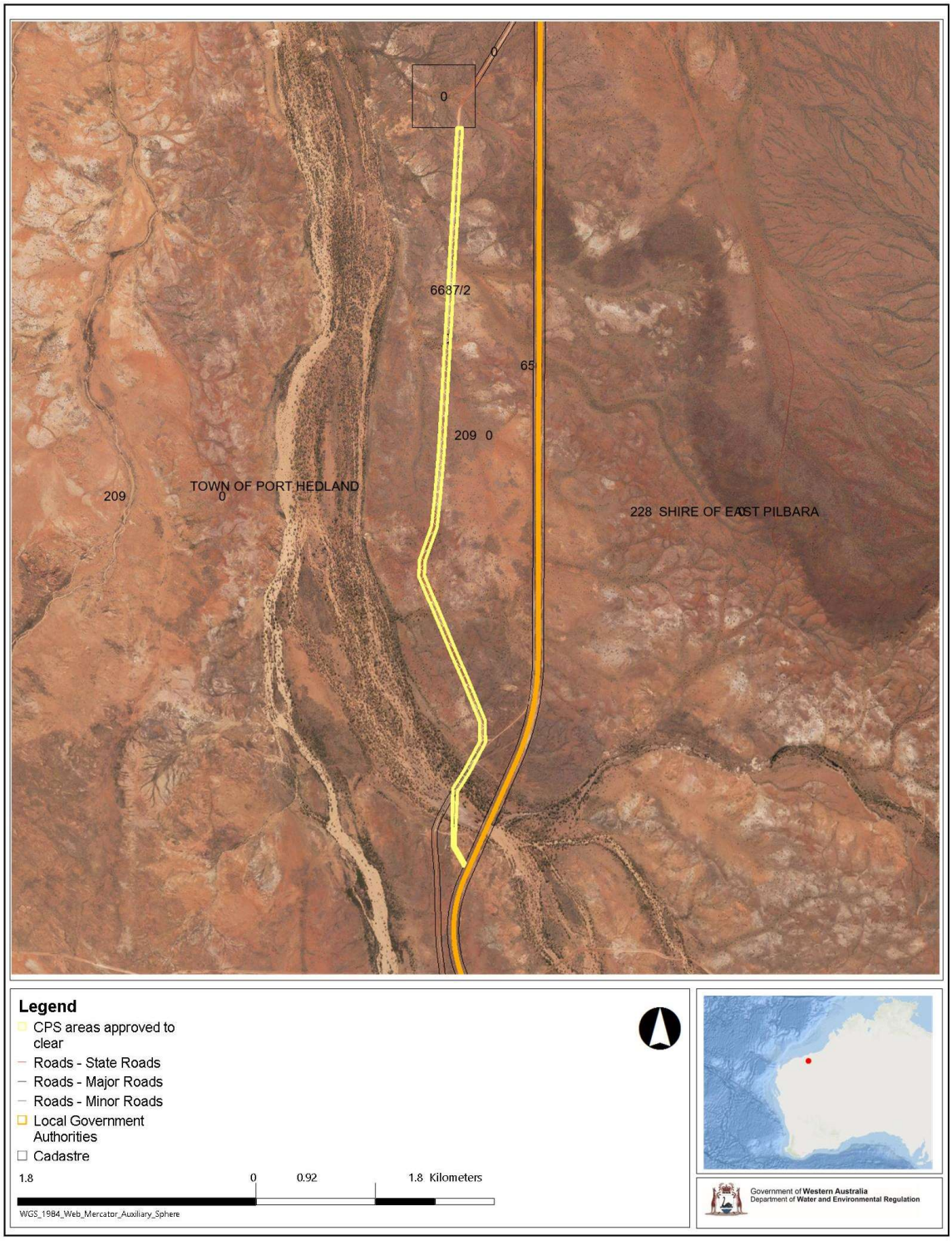

Figure 2 - Map 2 of 2 of the application area (Pipingarra Road portion). The area cross-hatched yellow indicates the area authorised to be cleared under the granted clearing permit.

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)

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 advised the following regarding avoidance and mitigation considerations:

- Requirements to widen the existing track areas were derived from an internal assessment based upon an external Restricted Access Vehicle assessment. This assessment identified minor adjustments to alignment, corner radius and width to ensure it remains safe and trafficable by heavy vehicles (IB Operations Pty Ltd, 2020);
- The road will be nominally 11 m width with additional batter area either side creating a 15 m wide formation. Additional verge clearing may be undertaken to remove obstacles to wide modules that will be transported to site (IB Operations Pty Ltd, 2020);
- Environmental management measures to mitigate the impacts of the clearing include (FMG, 2015):
    - Internal GDPs will be required prior to commencement of activities, which may include:
        - pre-clearance checks for conservation significant flora and/or vegetation undertaken by suitably experienced personnel prior to ground disturbance,
        - areas to be cleared clearly delineated both on maps and on the ground,
        - post-clearing audits undertaken to assess compliance with internal permits;
    - Vehicles will be confined to defined roads and access tracks;
    - Water trucks will be used for dust suppression on haul roads, access tracks, the pit floor and high traffic areas;
    - The use of surfactants to increase dust suppression capability of applied water will be
    - investigated;
    - Information in regards to the flora and vegetation of the Project area, and employee/contractor responsibilities in regards to this will be included in the site induction program; and
    - All machinery, vehicles and plant arriving on site will required to be free of vegetative matter and soil/mud.

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

A review of current environmental information (Appendix C) reveals that the assessment against the clearing principles has changed slightly from the Clearing Permit Decision Report CPS 6687/1. Since the time of the assessment undertaken for CPS 6687/1 listings have been changed for multiple conservation significant flora and fauna species found within the local area, and several conservation significant flora and fauna have been recorded within the application area (flora: *Euphorbia clementii,* fauna: *Macrotis lagotis* (bilby), *Pseudomys chapmani* (western pebble-mound mouse) and *Rhinonicteris aurantia* (Pilbara leaf-nosed bat)).

3.2.1. Biological values (fauna) - Clearing Principles a and b

Assessment: The application area may provide suitable habitat for the following conservation significant fauna species:

- *Liasis olivaceus barroni* (Pilbara olive python) (T)
- *Macroderma gigas* (Ghost bat) (T)
- *Macrotis lagotis* (Bilby, dalgyte, ninu) (T)
- *Dasyurus hallucatus* (Northern quoll) (T)
- *Falco hypoleucos* (Grey falcon) (T)
- *Ctenotus nigrilineatus* (Pin-striped finesnout Ctenotus) (P1)
- *Dasycercus blythi* (Brush-tailed mulgara) (P4)
- *Lagorchestes conspicillatus leichardti* (Spectacled hare-wallaby (mainland)) (P4)
- *Leggadina lakedownensis* (Northern short-tailed mouse, Lakeland Downs mouse, kerakenga) (P4)
- *Pseudomys chapmani* (Western pebble-mound mouse, ngadji) (P4)
- *Rhinonicteris aurantia* (Pilbara leaf-nosed bat) (P4)
- *Falco peregrinus* (Peregrine falcon) (OS)
- *Glareola maldivarum* (Oriental pratincole) (IA)
- *Apus pacificus* (Fork-tailed swift) (IA)
- *Charadrius veredus* (oriental plover) (IA)

The majority of the surveyed portions of the application area are considered to comprise of the habitat type "Rocky plains with spinifex" (Fortescue Metals Group (FMG), 2015) and topographic data, soil mapping, vegetation mapping and aerial imagery indicates the majority of the unsurveyed portions are also likely to contain this habitat type. This is likely to provide suitable habitat for the bilby (TSSC, 2016a), northern quoll (Hill and Ward, 2010), grey falcon (TSSC, 2020), Pin-striped finesnout Ctenotus (Wilson and Swan, 2013), brush-tailed mulgara (Masters et al, 2003), spectacled hare wallaby (Ingleby and Westoby, 1992), northern short-tailed mouse (Moro and Kutt, 2008), western pebble-mound mouse (Kitchener, 1983) and pegegrine falcon. The ghost Bat and Pilbara Leaf-nosed Bat (TSSC, 2016b) may forage within this habitat (TSSC, 2016b and 2016c)). Of the above species, the bilby, Pilbara leaf nosed bat, western pebble-mound mouse (FMG, 2015) and grey falcon (Ecologia, 2012b) have previously been recorded within this habitat type within the application area, and the fork-tailed swift was recorded outside of the application area, but within this habitat type by Ecologia (2012b). Although the Rocky plains with spinifex habitat may be suitable for the above species, as this habitat type is widespread throughout the surrounding area, this habitat within the application area is already disturbed from the currently constructed roads, and this habitat type is not considered to be critical habitat for the above species (Ecologia, 2012b), the clearing of this habitat is not considered to have a significant impact on the above species on a regional scale.

Small portions of the application area intersecting the Turner River and fringing vegetation are also likely to provide creekline habitat, characterised by large eucalypt trees fringing water courses with or without surface water (Ecologia, 2012b). These areas are likely to provide suitable habitat for many of the above species, most notably the northern quoll (Ecologia, 2012b), Pilbara olive python (Ecologia, 2012b and Department of the Environment, Water, Heritage and the Arts, 2008), Pilbara Leaf-nosed Bat (Ecologia, 2012b), fork tailed swift (Department of the Environment and Heritage, 2006), oriental pratincole (Department of the Environment, 2020a) and oriental plover (Department of the Environment, 2020b), particularly when these areas are wet. However, given the small extent of vegetation to be cleared within areas of this habitat type, and that this habitat type is not considered to be critical habitat for the above species (Ecologia, 2012b), the clearing of these areas is not considered likely to have a significant impact on the above species on a regional scale.

Given the clearing footprint contains previously cleared existing roads and that better quality vegetation is abundant within the local area, it is considered unlikely that individual fauna would be utilising burrows or mounds within the clearing footprint. It is considered that even if burrows or mounds were present within the application area, given the proposed clearing is for maintenance of existing road corridors, clearing activities would be unlikely to impact these habitat structures. As such, it is considered that the proposed clearing is unlikely to impact individual fauna species utilising the application area.

Conclusion: Based on the above assessment, the proposed clearing is unlikely to result in impacts to conservation significant fauna species**.**

Conditions: No fauna management conditions required.

3.2.2. Biological values (flora) - Clearing Principles a and c

Assessment: One threatened flora species, *Quoya zonalis K.A.Sheph. & Hislop (Pilbara Foxglove)* (previously named *Pityrodia sp. Marble Bar*), has been recorded within the local area, and individuals of this species were found in the Ecologia (2012a) and Ecoscape (2020) survey areas, although outside of the application area. A targeted survey (Ecologia, 2012d) was undertaken in a survey area encompassing portions of the application area, which also recorded this species approximately 13 kilometres from the application area. However, all DBCA records of this species within the local area have been recorded within soil type 280Cp, described as "rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs" (DPIRD, 2019). Given that the application area does not contain these types of habitats, it is considered unlikely that this species is present within the application area.

The following priority flora species present within the local area have been recorded within the same soil and vegetation types present within the application area:

- *Josephinia sp. Woodstock (A.A. Mitchell PRP 989)* (P1)
- *Eragrostis crateriformis* (P3) x
- *Euphorbia clementii* (P3)
- *Fimbristylis sieberiana* (P3)
- *Gomphrena leptophylla* (P3) x
- *Gymnanthera cunninghamii* (P3) x
- *Heliotropium murinum* (P3)
- *Heliotropium muticum* (P3)
- *Nicotiana umbratical* (P3)
- *Phyllanthus hebecarpus* (P3)
- *Rothia indica subsp. australis* (P3) x
- *Stylidium weeliwolli* (P3)
- *Terminalia supranitifolia* (P3)
- *Triodia chichesterensis* (P3)
- *Bulbostylis burbidgeae* (P4)
- *Goodenia nuda* (P4)
- *Ptilotus mollis* (P4)

Of these species, it is considered that *Bulbostylis burbidgeae*, *Fimbristylis sieberiana, Nicotiana umbratica* or *Phyllanthus hebecarpus* are unlikely to be present within the application area, given the lack of preferred habitat for these species (granite outcrops, Pool edges and sandstone cliffs, rocky outcrops and granite outcrops respectively (Western Australian Herbarium, 1998-)). Furthermore, *Heliotropium murinum* and *Josephinia sp. Woodstock (A.A. Mitchell PRP 989)* are considered unlikely to occur within the application area, given that the closest records of these species are more than 40 kilometres from the application area.

Euphorbia clementii has previously been recorded within the application area, and it is considered that the remaining above flora species may occur within unsurveyed portions of the application area. Given that the proposed clearing is for the purpose of maintaining existing road corridors, the Degraded condition of the vegetation, and the relatively large number of records for most of these species, it is considered that even if these species were present within the application area, the impact to the conservation status of these species from the proposed clearing is likely to be minimal. Of these species, only *Gomphrena leptophylla* is known from less than 20 records in Western Australia (Western Australian Herbarium, 1998-), however it is noted that this species is abundant in the Northern Territory and Queensland (Atlas of Living Australia, 2020).

Conclusion: Based on the above assessment, the proposed clearing is unlikely to result in impacts to conservation significant flora species**.**

Conditions: No flora management conditions required.

3.2.3. Waterbodies and water quality - Clearing Principles f and i

Assessment: The application footprint intersects the Turner River and numerous minor, non-perennial watercourses. The proposed clearing will remove vegetation that is associated with the watercourses. However, given that the proposed clearing is for the purpose of maintaining existing road corridors and that the clearing is of a linear nature, potential impacts to surface water or groundwater quality are likely to be minimal.

Conclusion: Based on the above assessment, the proposed clearing is unlikely to result in impacts to waterbodies, surface water quality or groundwater quality.

Conditions: No management conditions required.

3.3. Relevant planning instruments and other matters

The Town of Port Hedland advised DWER that they did not have any objections to the proposed clearing and stated that ground stabilisation/reinforcement is to be implemented along areas susceptible to erosion and degradation for the duration of the access track (Town of Port Hedland, 2020).

Several Aboriginal sites of significance have been mapped within the application area, and a reserve for the purpose of "Use and Benefit of Aboriginal People" is located approximately 1.5 km west of the Wodgina Road portion of 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.

The application area falls within the Pilbara Surface Water Area covered by the *Rights in Water and Irrigation Act 1914*. The Department of Water (DoW) (2015) has advised that as there is no new infrastructure to be built that may disturb these waterways and the proposed clearing is for the management of re-growth, there is no requirements for a bed and banks permit (DoW, 2015).

End

Appendix A. Site characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The proposed clearing footprint areas are part of an expansive tract of native vegetation interspersed with roads, tracks and railways. Spatial data indicates the local area (50 km radius of the proposed clearing area) retains over 99% of the original native vegetation cover.
Ecological linkage	Given the highly vegetated state of the local area, the application area does contribute to or comprise an ecological linkage.
Conservation areas	No conservation areas are within a 50 km radius of the application area.

Vegetation description	Vegetation mapping provided by FMG (2015), reflecting data from Ecologia (2012a) and Biota (2004) indicates the proposed clearing area contains the following vegetation types:
	• AaTb: *Petalostylis labicheoides* and *Acacia acradenia* sparse mid shrubland, over *Corchorus laniflorus* sparse low shrubland, over *Chrysopogon fallax* sparse tussock grassland and *Triodia basedowii* sparse hummock grassland;
	• AaTw2: *Acacia acradenia* open mid shrubland, over *Triodia wiseana* hummock grassland;
	• Ac2: *Eucalyptus camaldulensis* scattered low trees over *Melaleuca argentea* low open forest over *Melaleuca linophylla*, *Acacia ampliceps* high shrubland;
	• Ac22: *Corymbia* spp. low open woodland over Acacia acradenia, *A. ancistrocarpa* open scrub over *Triodia epactia* open hummock grassland and *Chrysopogon fallax, Themeda triandra* tussock grassland;
	• Ac5/Ac6: Mosaic of:
	  ○ *Acacia camaldulensis* low open woodland over *Acacia trachycarpa* high shrubland over *Triodia epactia* mid dense hummock grassland and **Cenchrus ciliaris* tussock grassland; and
	  ○ Eucalyptus victrix scattered trees over *Acacia coriacea subsp.pendens*, *Atalaya hemiglauca*, *Hakea lorea subsp. lorea* high open shrubland over **Cenchrus ciliaris* tussock grassland;
	• Apt12: *Acacia inaequilatera* scattered tall shrubs over *Triodia lanigera* mid-dense hummock grassland;
	• Apt13: *Acacia ancistrocarpa* open shrubland to open heath over *Triodia lanigera* hummock grassland;
	• Apt4/Apt1: Mosaic of:
	  ○ *Triodia longiceps, T. epactia* mid-dense hummock grassland; and
	  ○ *Triodia epactia, T. secunda* mid-dense hummock grassland
	• Cc: *Cenchrus ciliaris* tussock grassland;
	• ChAbTp: *Corymbia hamersleyana* open low woodland over *Acacia bivenosa* mid-shrubland over *Triodia pungens* open hummock grassland and **Cenchrus ciliaris* sparse tussock grassland;
	• Tw3: *Triodia wiseana* and *Triodia basedowii* hummock grassland; and
	• Tw4: *Triodia wiseana* hummock grassland (see Figures D-1 and D-2, Appendix D).
	It is noted that the above FMG (2015) vegetation mapping does not include the northernmost 1 km of the Pippingarra Road portion of the application area and the westernmost 3.6 km of the Wodgina Road portion of the application area. A further survey conducted by Ecoscape (2020) mapped vegetation within small areas of the aforementioned 3.6 km Wodgina Road portion of the application area as follows:
	• AoTw: *Acacia orthocarpa* and *A. inaequilatera* tall sparse shrubland; and
	• AaTl: *Acacia ancistrocarpa* tall sparse shrubland (see Figures D-3 and D-4, Appendix D).

Characteristic	Details
	FMG (2015) states that while not all areas of vegetation within the application area have been mapped, based on aerial imagery, similar vegetation communities to those listed above are expected to occur in unmapped areas. The above mapped vegetation types (FMG, 2015 and Ecoscape, 2020) are broadly consistent with the mapped Beard vegetation types: • Abydos Plain – Chicester 93, which is described as Hummock grasslands, shrub steppe; kanji over soft spinifex; and • Abydos Plain – Chicester 619, which is described as Medium woodland; river gum (*Eucalyptus camaldulensis*) (Shepherd et al, 2001).
Vegetation condition	Ecologia (2012a) describes the vegetation within the Pipingarra Road portion of the proposed clearing area to be in Very Good (60% of application area surveyed) or Excellent (40% of application area surveyed) (Trudgen, 1991) condition. However, FMG (2015) notes that this vegetation condition mapping at an approximately 1:10,000 scale and does not take into consideration local disturbances such as the already disturbed Pippingarra Road and Wodgina Road. FMG (2015) therefore considers that Vegetation condition within the clearing permit envelope would be considered Very Poor to Completely Degraded (Trudgen, 1991) condition, described as: • Very Good - 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. The full Trudgen (1991) condition rating scale is provided in Appendix C.
Climate	Rainfall: 400 mm Evapotranspiration: 400 mm
Topography	Wodgina Road portion: Ranges from 150 metres AHD at the northern end to 170 metres AHD at the southern end. Pipingarra Road portion: approximately 170 metres AHD.
Soil description	The soil is mapped as: • Majority of Wodgina Road and Pipingarra Road portions - 283Mc (Macroy System), described as stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands; • Small areas of Wodgina Road and Pipingarra Road portions - 283Ri (River System), 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; • Small area of Wodgina Road portion: 283Ua (Uaroo System), described as broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs; and • Small area of Pipingarra Road portion: 280Bg (Boolgeeda System), described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands (DPIRD, 2019).

Land degradation risk	• 283Mc:
	  ○ Subsurface Acidification Susceptibility - 45% of map unit has a high susceptibility (Schoknecht et al., 2004);
	  ○ Subsurface Compaction Susceptibility - 45% of the map unit has a high susceptibility (Schoknecht et al., 2004);

Characteristic	Details
	○ Macroy system has low or very low erosion hazard (van Vreeswyk et al, 2004); • 283Ri: ○ Subsurface Acidification Susceptibility - 60% of map unit has a high susceptibility (Schoknecht et al., 2004); ○ Subsurface Compaction Susceptibility - 60% of the map unit has a high susceptibility (Schoknecht et al., 2004); ○ River system has high or very high susceptibility to erosion if vegetative cover is removed (van Vreeswyk et al, 2004). • 283Ua: ○ Subsurface Acidification Susceptibility - 93% of map unit has a high susceptibility (Schoknecht et al., 2004); ○ Subsurface Compaction Susceptibility - 93% of the map unit has a high susceptibility (Schoknecht et al., 2004); ○ Occasionally some erosion and pasture decline is evident on drainage tracts of the Uaroo system, but generally the system is not susceptible to erosion (van Vreeswyk et al, 2004). • 280Bg: ○ Subsurface Acidification Susceptibility - 0% of map unit has a high susceptibility (Schoknecht et al., 2004); ○ Subsurface Compaction Susceptibility - 0% of the map unit has a high susceptibility (Schoknecht et al., 2004); ○ The Boolgeeda system is not susceptible to erosion (van Vreeswyk et al, 2004).
Waterbodies	The desktop assessment indicated that the Wodgina Road portion of the application area intersects two non-perennial branches of the Turner River and six minor non-perennial watercourses within the Turner River catchment. The Pipingarra Road portion of the application area intersects an inundation area adjacent to a non-perennial branch of the Turner River, as well as thirteen minor non-perennial watercourses within the Turner River catchment.
Hydrogeography	Hydrogeology: Rocks of Low Permeability, Fractured and Weathered Rocks - Local Aquifers, granitoid lithology Groundwater salinity: 500-1000 mg/L TDS The application lies within the Pilbara Groundwater Area and Pilbara Surface Water Area proclaimed under the *Rights in Water and Irrigation Act 1914 (WA).*
Flora	A search of relevant datasets found that one threatened flora species and 22 priority flora species have been recorded within the local area (50km), with *Euphoria clementii* (Priority 3), recorded within the Pipingarra Road portion of the application area, the closest recorded conservation significant flora species to the application area. No conservation flora species were found within portions of the application area searched by Ecologia (2012a, 2015) or Ecoscape (2020). Ecoscape (2020) recorded *Heliotropium muticum* 25 m from the Wodgina Road portion of the application area and *Triodia chichesterensis* (recorded 80 m from the Pipingarra Road portion of the application area). A database of conservation significant flora mapping made available to Ecoscape (2020) by Fortescue/Iron Bridge contains records of *Goodenia nuda* approximately 100 m from the Pipingarra Road portion of the application area.
Ecological communities	No threatened or priority ecological communities are recorded within the local area.
Fauna	A search of relevant datasets found that six threatened fauna species, nine priority fauna species, 16 fauna species under international agreement and one other specially protected fauna species have been recorded within the local area (50km). Two of these records are within the application area: *Rhinonicteris aurantia (Pilbara)* (Pilbara leaf-nosed bat) (Threatened) and *Macrotis lagotis* (bilby) (Threatened).

Characteristic	Details
	Fauna surveys undertaken by Ecologia (2012b and 2012c), Bamford Consulting Ecologists (20102) and Ecoscape (2020) in portions of the application area found no conservation significant fauna to be present within surveyed portions of the application area. Conservation significant fauna data held by FMG (2015) shows two Western pebble-mound mouse records present within the Wodgina Road portion of the application area (see Figures D-5 and D-6 in Appendix D).

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
Vegetation complex					
93	3,042,114.27	3,038,471.67	99.88	59,536.96	1.96
619	118,920.31	118,116.78	99.32	236.34	0.20

*Government of Western Australia (2019a)

A.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E), and biological survey information (Ecologia, 2012a and 2015 and Ecoscape, 2020) impacts to the following conservation significant flora required further consideration.

Flora Species	Listing	Distance of closest record to application area (kilometres)	Number of records in local area	Total number of records in Florabase (Western Australian Herbarium, 1998-)	Suitable soil type?	Suitable vegetation type?	Are surveys adequate to identify? (Y, N, N/A)
Bulbostylis burbidgeae	P4	4.8	20	34	Y	Y	N
Eragrostis crateriformis	P3	9.4	9	49	Y	Y	N
Euphorbia clementii	P3	0	23	30	Y	Y	N
Fimbristylis sieberiana	P3	23.3	2	25	Y	Y	Y
Gomphrena leptophylla	P3	6.5	2	8	Y	Y	N
Goodenia nuda	P4	approx. 0.2 (Ecologia, 2012a)	1	107	Y	Y	N
Gymnanthera cunninghamii	P3	0.4	10	39	Y	Y	N
Heliotropium murinum	P3	42.7	3	15	Y	Y	N

Flora Species	Listing	Distance of closest record to application area (kilometres)	Number of records in local area	Total number of records in Florabase (Western Australian Herbarium, 1998-)	Suitable soil type?	Suitable vegetation type?	Are surveys adequate to identify? (Y, N, N/A)
Heliotropium muticum	P3	0.025 (Ecoscape, 2020)	31	73	Y	Y	N
Josephinia sp. Woodstock (A.A. Mitchell PRP 989)	P1	41.3	3	7	Y	Y	N
Nicotiana umbratica	P3	1.2	9	18	Y	Y	N
Phyllanthus hebecarpus	P3	4.3	5	7	Y	Y	N
*Quoya zonalis K.A.Sheph. & Hislop (Pilbara Foxglove)**	T	12.4	72	16	N	Y	N
Ptilotus mollis	P4	24.7	4	39	N	Y	N
Rothia indica subsp. australis	P3	21.3	6	21	Y	Y	N
Stylidium weeliwolli	P3	7.0	2	29	N	Y	N
Terminalia supranitifolia	P3	4.9	5	46	Y	Y	N
Triodia chichesterensis	P3	0.08 (Ecoscape, 2020)	17	20	Y	Y	N

T: threatened, P: priority

* previously named *Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)*

A.4. Fauna analysis table

Fauna Species	Listing	Distance of closest record to application area (kilometres)	Number of records in local area	Most recent record	Suitable habitat?	Are surveys adequate to identify? (Y, N, N/A)
Apus pacificus (Fork-tailed swift)	IA	1.1	12	2014	Y	N
Calidris acuminata (Sharp-tailed sandpiper)	IA	40.7	1	1979	possible	N
Charadrius veredus (oriental plover)	IA	15.7	1	1999	possible	N
Ctenotus nigrilineatus (Pin-striped finesnout Ctenotus)	P1	26.3	7	2012	Y	N
Dasycercus blythi (Brush-tailed mulgara)	P4	3.1	120	2019	Y	N

Fauna Species	Listing	Distance of closest record to application area (kilometres)	Number of records in local area	Most recent record	Suitable habitat?	Are surveys adequate to identify? (Y, N, N/A)
Dasyurus hallucatus (Northern quoll)	T	0.7	1377	2019	Y	N
Falco hypoleucos (Grey falcon)	T	3.5	14	2017	Y	N
Falco peregrinus (Peregrine falcon)	OS	4.5	4	2013	Y	N
Glareola maldivarum (Oriental pratincole)	IA	41.7	4	2012	possible	N
Lagorchestes conspicillatus leichardti (Spectacled hare-wallaby (mainland))	P4	0.1	155	2018	Y	N
Leggadina lakedownensis (Northern short-tailed mouse, Lakeland Downs mouse, kerakenga)	P4	26.3	2	2001	Y	N
Liasis olivaceus barroni (Pilbara olive python)	T	2.9	62	2017	Y	N
Macroderma gigas (Ghost bat)	T	4.6	119	2018	possible	N
Macrotis lagotis (Bilby, dalgyte, ninu)	T	0	498	2018	Y	N
Pseudomys chapmani (Western pebble-mound mouse, ngadji)	P4	0 (FMG, 2015)	140	2019	Y	N
Rhinonicteris aurantia (Pilbara leaf-nosed bat)	P4	0	385*	2019	possible	N

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

* Also includes records for *Rhinonicteris aurantia* (Orange leaf-nosed bat) as because they records are within the Pilbara region, they would be considered part of the Pilbara leaf nosed bat population (Armstrong, 2006)

Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: Several conservation significant flora and fauna species have been recorded within the application area.	May be at variance (changed from CPS 6687/1 to reflect updated conservation significant fauna information)	Yes: Refer to Sections 3.2.1 and 3.2.2 above.
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: The area proposed to be cleared is not likely to contain significant habitat for conservation significant fauna.	Not likely to be at variance (as per CPS 6687/1)	Yes: Refer to Section 3.2.2 above.
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is unlikely to contain flora species listed under the BC Act.	Not likely to be at variance (changed from CPS 6687/1 to reflect updated threatened flora information)	Yes: Refer to Section 3.2.2 above.
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 area proposed to be cleared d*oes* not contain species that can indicate a threatened ecological community.	Not at variance (as per CPS 6687/1)	No: Refer to Section 3.2.2 above.
Environmental value: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The extent of the mapped vegetation type and native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	Not at variance (as per CPS 6687/1)	No
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 any conservation areas.	Not at variance (as per CPS 6687/1)	No
Environmental value: land and water resources		

Assessment against the clearing principles	Variance level	Is further consideration required?
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: The application area intersects the Turner River and numerous minor, non-perennial watercourses. The proposed clearing will remove vegetation that is associated with the watercourses.	At variance (as per CPS 6687/1)	Yes: Refer to Section 3.2.3 above.
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: Given the proposed end land use (road) of the application area, linear nature of the application area, proposed erosion management measures, that the mapped soils in the majority of the application area are not susceptible to erosion, and the small extent of mapped soil types susceptible to erosion, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance (as per CPS 6687/1)	No
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: Considering the relatively small amount of clearing within a larger footprint, that the clearing is of a linear nature, and proposed management measures potential impacts to surface water or groundwater quality are likely to be short term and minimal.	Not likely to be at variance (as per CPS 6687/1)	Yes: Refer to Section 3.2.3, above.
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: Given that the proposed clearing will remove relatively narrow linear bands of vegetation and the topographic contours in the surrounding area, *the proposed clearing is unlikely to contribute to increased incidence or intensity of flooding.*	Not likely to be at variance (as per CPS 6687/1)	No

Appendix C. Vegetation condition rating scale

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

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen (1991).

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

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.

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

Appendix D. Biological survey information excerpts

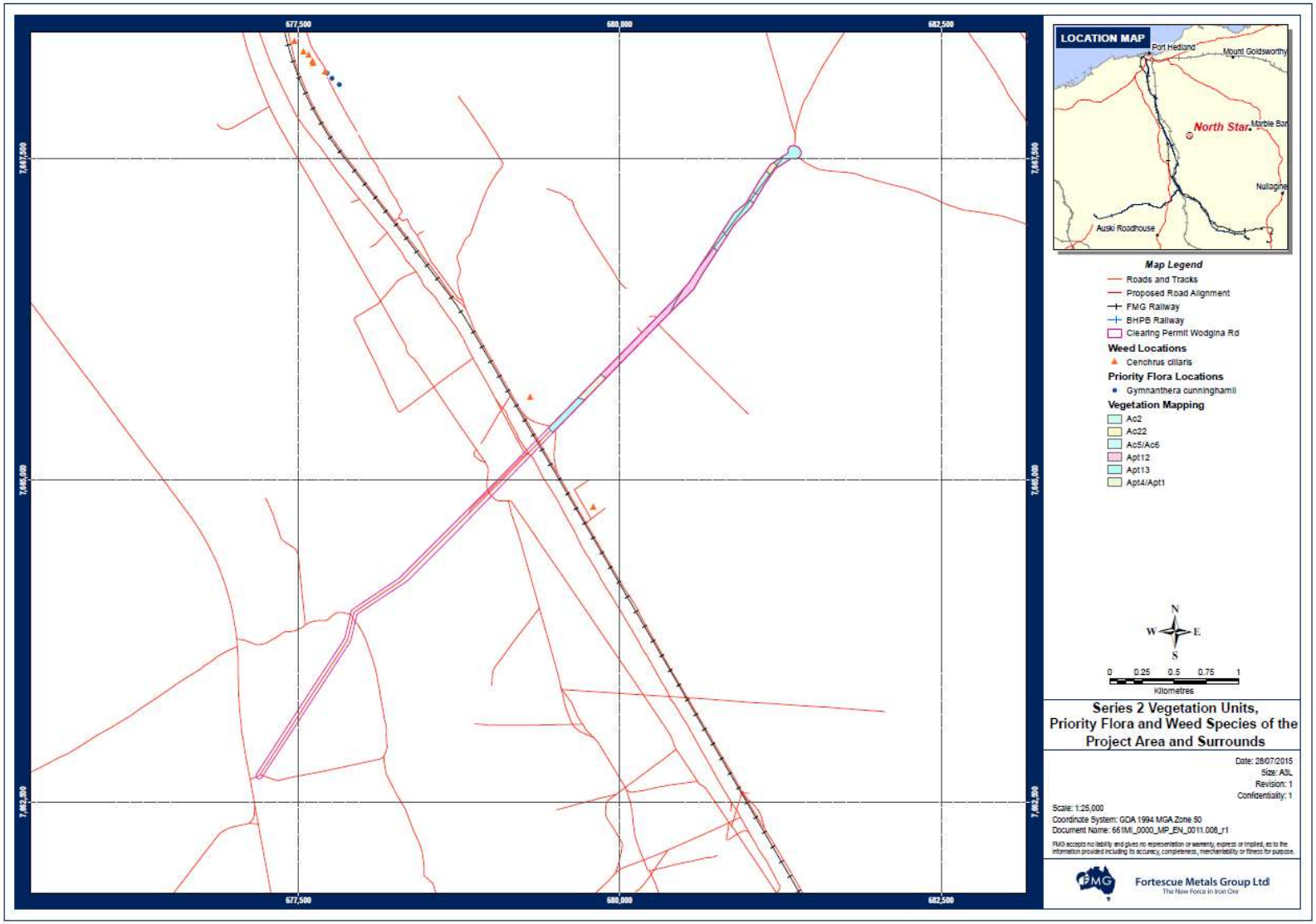

Figure D-1 – Vegetation and conservation significant flora mapping in Wodgina Road portion of application area (FMG, 2015)

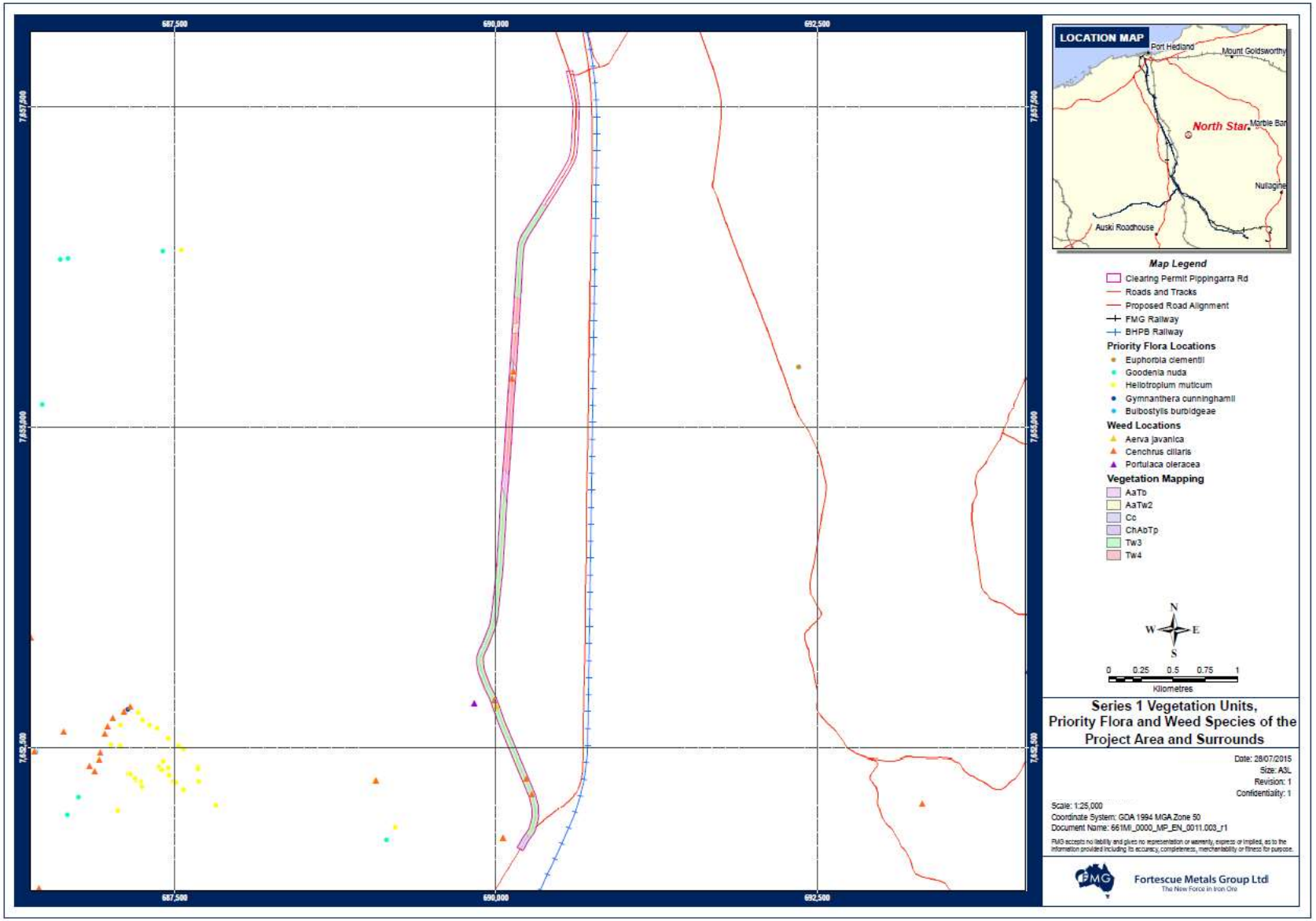

Figure D-2 – Vegetation and conservation significant flora mapping in Pipingarra Road portion of application area (FMG, 2015)

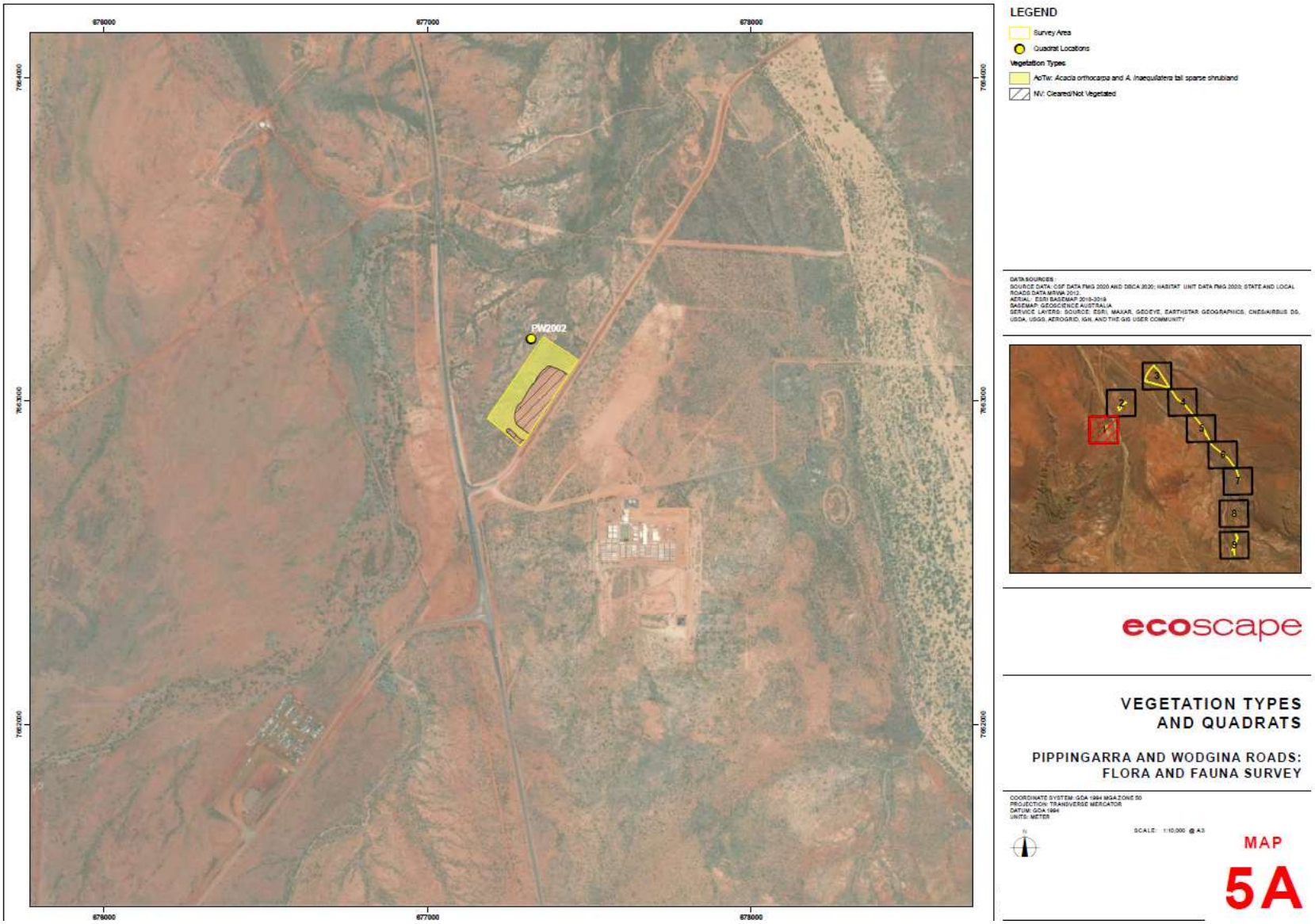

Figure D-3 – Vegetation and conservation significant flora mapping in Wodgina Road portion of application area (Ecoscape, 2015)

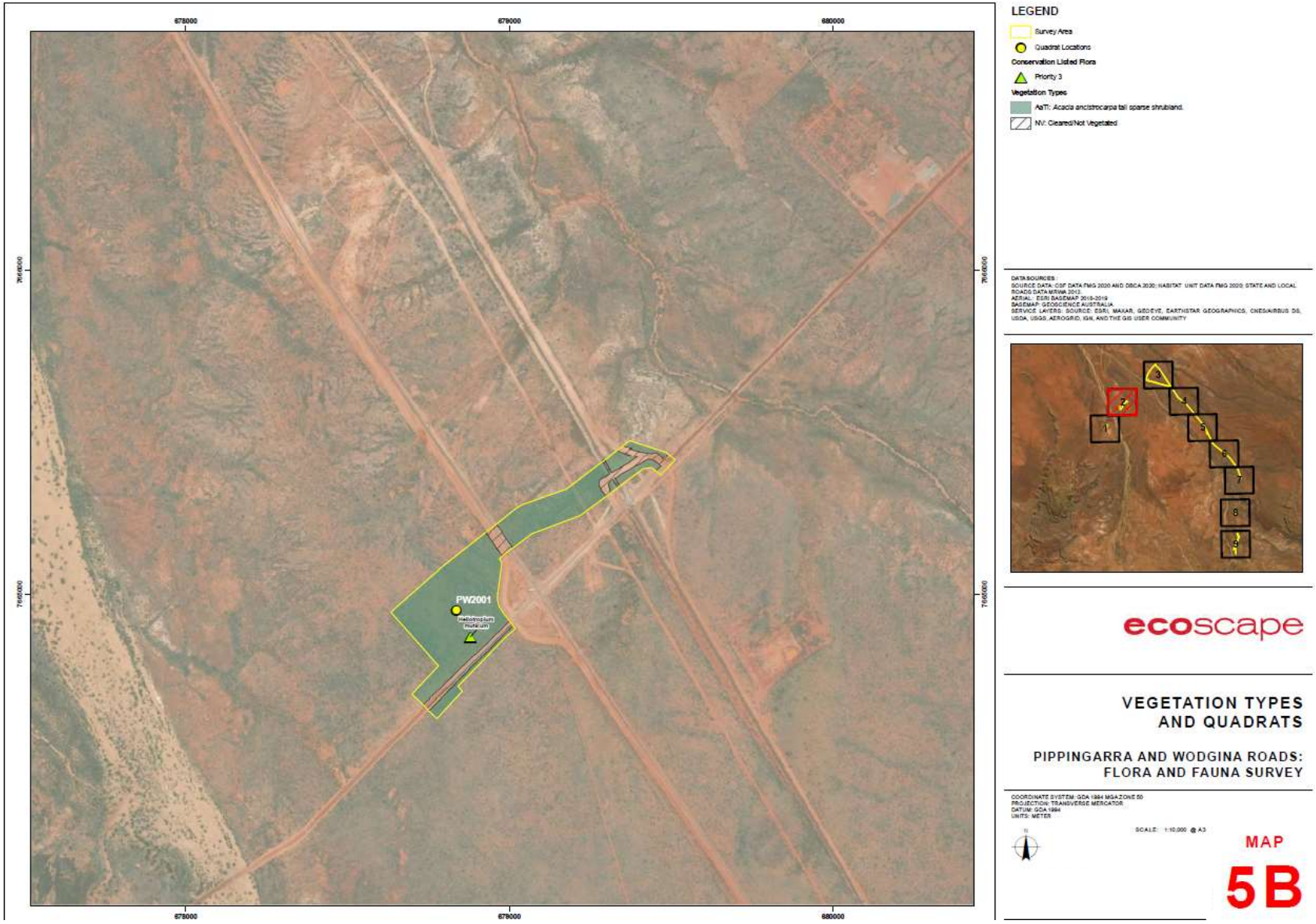

Figure D-4 – Vegetation and conservation significant flora mapping in Wodgina Road portion of application area (Ecoscape, 2020)

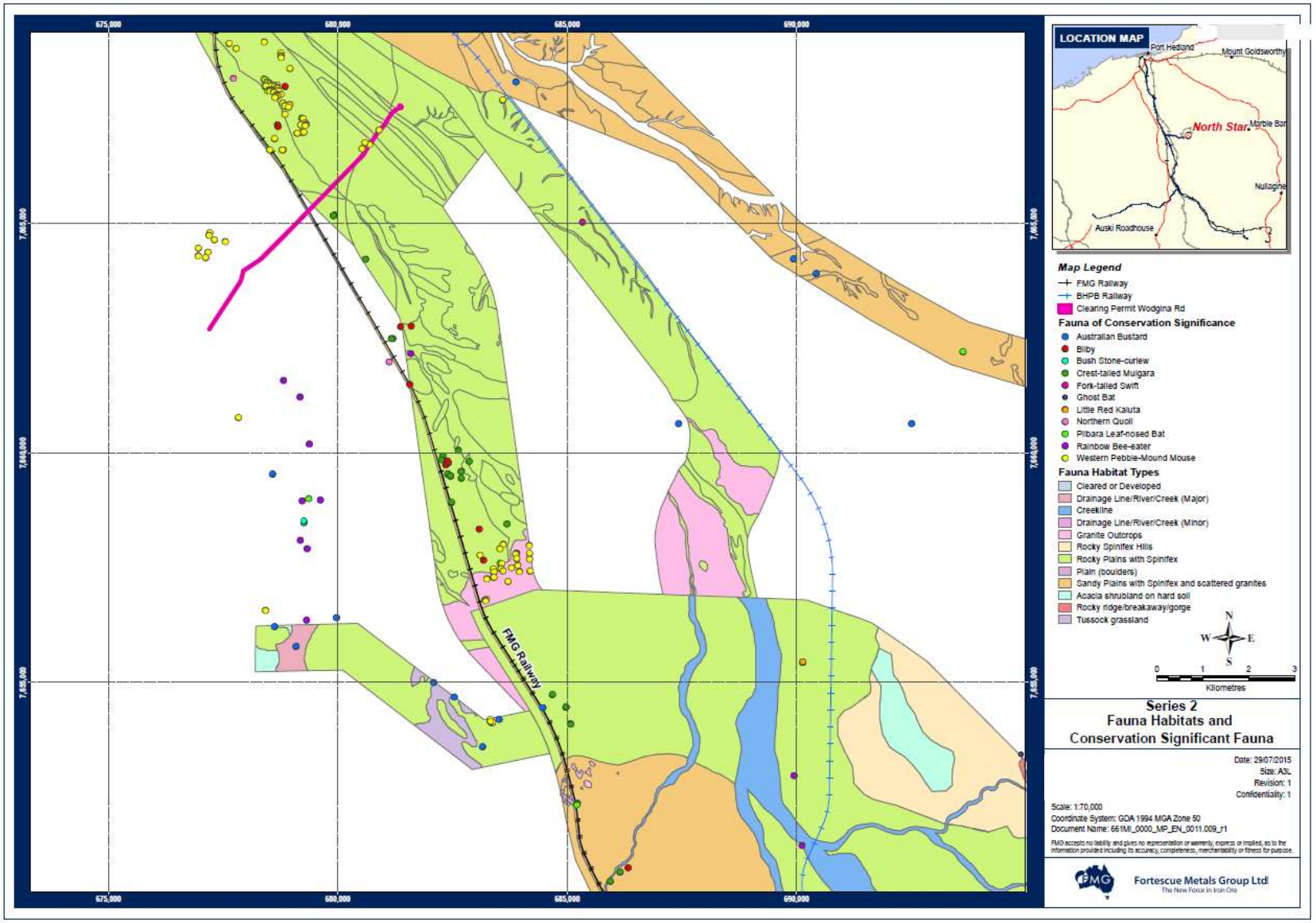

Figure D-5 – Fauna habitat and conservation significant fauna mapping in Wodgina Road portion of application area (FMG, 2015)

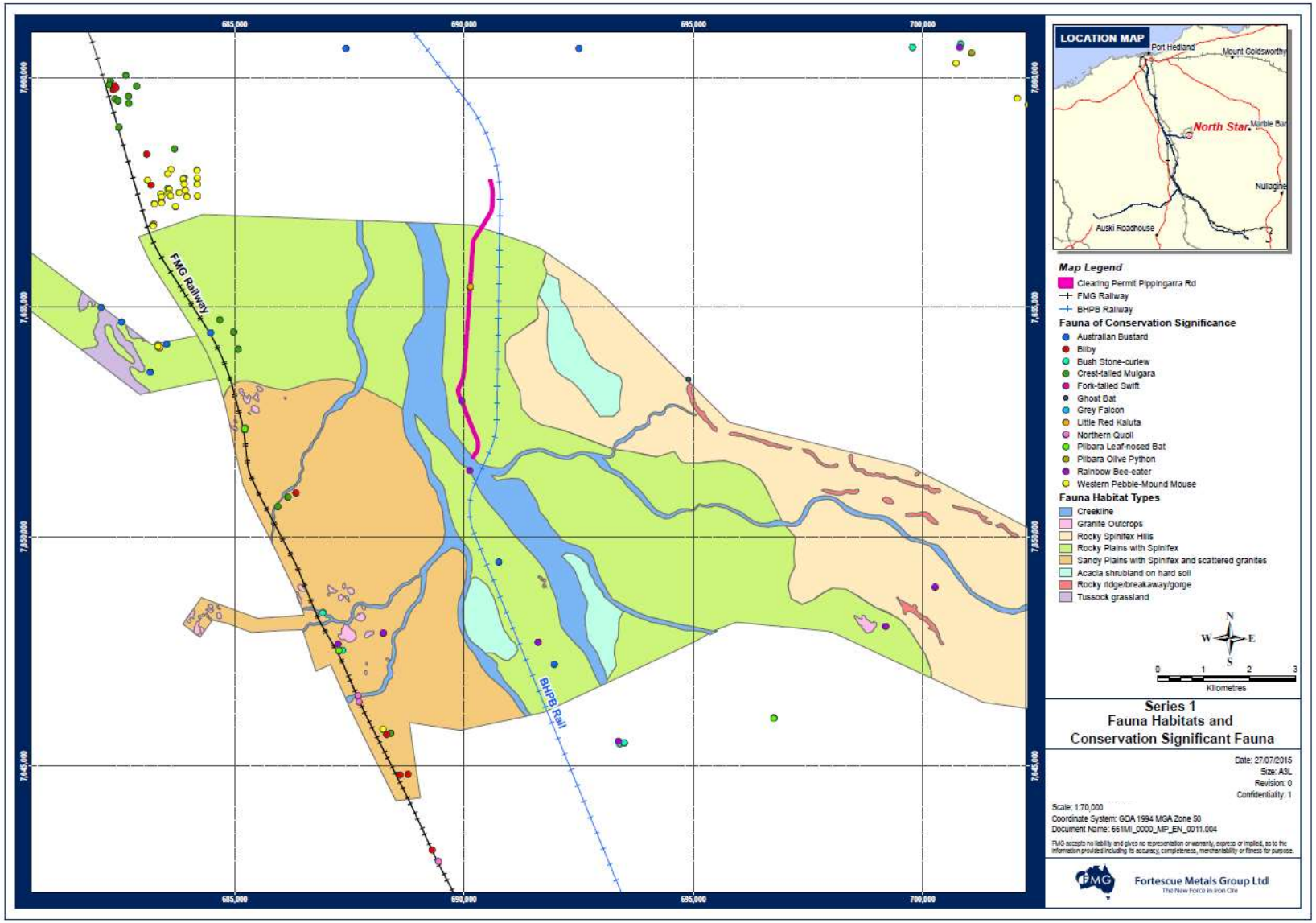

Figure D-6 – Fauna habitat and conservation significant fauna mapping in Pipingarra Road portion of application area (FMG, 2015)

Appendix E. Sources of information

E.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- IBRA Vegetation Statistics
- Imagery
- 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 – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Subsurface Compaction Risk (DPIRD-012)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL) (DBCA-036)
- Threatened Flora (WAHerb)
- Threatened and Priority Fauna (DBCA-037)
- Threatened Ecological Communities and Priority Ecological Communities (DBCA-038)
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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