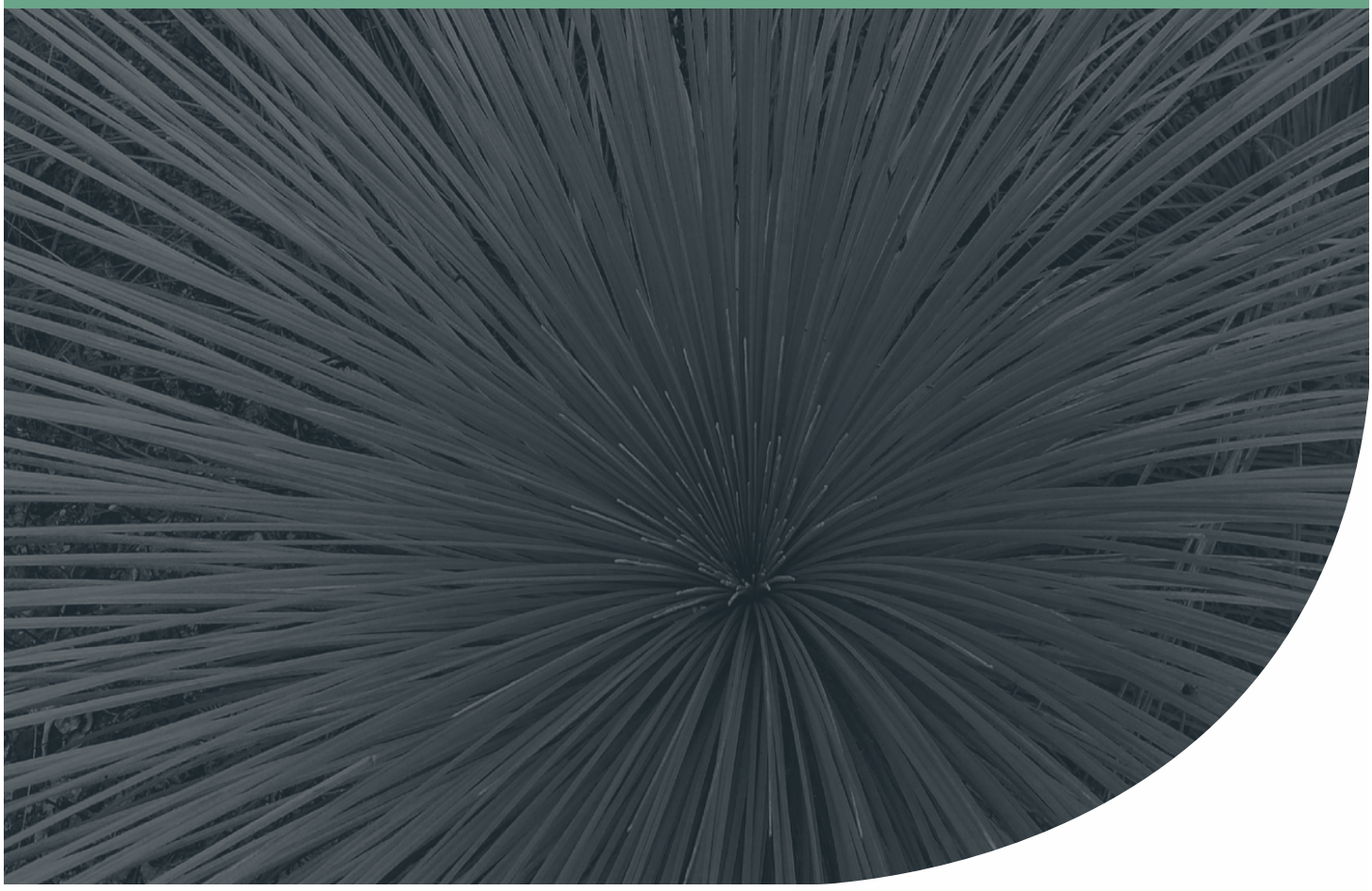
Section 38 Referral Supporting Document

Parron Wind Farm Development

Project No: EP23-085(12)

Prepared for Zephyr Energy Pty Ltd
January 2025



Document Control

Doc name:	Section 38 Referral Supporting Document Parron Wind Farm Development				
Doc no.:	EP23-085(12)--013 LLE				
Version	**Date**	**Author**		**Reviewer**	
1	January 2025	Flo Kaempf	FIK	Jason Hick	JDH
	Final document for lodgement with referral				

Executive Summary

Zephyr Energy Pty Ltd (referred to herein as Zephyr or the 'Proponent') proposes to develop the Parron Wind Farm, located approximately 8 km north-west of Badgingarra, Western Australia (herein referred to as 'the Proposal'). The Development Envelope (DE) is approximately 8,527.4 hectares (ha) with a total Disturbance Footprint (DF) of 491.54 ha. The Proposal involves the construction of up to 79 Wind Turbine Generators (WTG) capable of generating up to 489.8 MW along with associated infrastructure including access roads, electrical cabling and a substation. The wind farm will be connected to the existing 330kV transmission network which is situated within the DE. The DE primarily consists of cleared agricultural land currently used for pastoral grazing and cropping. The Proposal aims to contribute to Western Australia's renewable energy targets while minimising environmental impacts.

The Proposal is being referred to the Environmental Protection Authority (EPA) pursuant to Part IV of the *Environmental Protection Act 1986* (EP Act) and has also been referred pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Other key approvals required include Development Approval (DA) pursuant to the *Planning and Development Act 2006* (PD Act) that has been secured and a 5C groundwater abstraction water licence for construction water pursuant to the *Rights in Water and Irrigation Act 1914* (RIWI Act), which will be resolved once final construction water requirements are resolved. The latter may be resolved through the acquisition/transfer of an existing water licence from another holder within the relevant groundwater licencing subarea.

Consultation has been undertaken with key stakeholders, including local and state government agencies, community groups, the Yued Aboriginal Corporation (Yued) and neighbouring landowners. Further consultation will continue throughout any assessment and secondary approvals processes, and the construction and operational phases of the Proposal.

The Proposal layout and design has considered the environmental principles and factors including the precautionary principle, intergenerational equity, conservation of biological diversity, valuation, and waste minimisation. Preliminary environmental investigations have identified three key relevant environmental factors (EPA 2018) that required specific consideration:

- Flora and Vegetation
- Terrestrial Fauna
- Social Surroundings.

Other environmental factors including Benthic Communities and Habitats, Coastal Processes, Marine Environmental Quality, Marine Fauna, Landforms, Subterranean Fauna, Terrestrial Environmental Quality, Inland Waters, Air Quality, Greenhouse Gas Emissions and Human Health were determined not to be key factors requiring further assessment.

The DE is predominantly situated on agricultural land that has been historically disturbed and cleared of native vegetation. No threatened or priority flora or threatened or priority ecological communities were identified within the DE. One threatened fauna species (Carnaby's cockatoo) was recorded in

the DE, and two specially protected fauna species (fork-tailed swift and peregrine falcon), were initially considered 'possible' to occur.

The Proposal has considered and accommodated opportunities for the avoidance of potential environmental impacts through the refinement of the DF. The DF is sited on cleared agricultural land with scattered non-native vegetation and has been intentionally designed to avoid disturbance to intact native vegetation. There will be minimal permanent impact to/loss of black cockatoo primary native foraging habitat within the DE (up to 0.04 ha). Some trimming of black cockatoo primary native foraging habitat (0.19 ha) associated with the Cowalla Road/Brand Highway intersection works is proposed to enable the transportation of WTGs into the DE as necessary. Measures are to be implemented to protect fauna during construction and operation of the wind farm. Mitigation strategies have been considered and will be implemented to minimise potential visual and noise impacts and impacts from shadow flicker.

The Proponent is committed to developing the project in an environmentally responsible manner, adhering to relevant legislation and guidelines, and implementing best practice environmental management measures. The Proponent will continue to engage with stakeholders throughout the secondary approvals, construction and operational phase of the Proposal.

The EPA environmental factors and the assessed relevance to the Proposal are summarised below in **Table ES1**.

Table ES1: Consideration of environmental factors in relation to the Proposal

Theme	Factor	Relevance to Proposal
Sea	Benthic Communities and Habitats	**Not applicable.** The Proposal is not associated with activities that will impact on or disturb any benthic habitats.
	Coastal Processes	**Not applicable.** The Proposal is not associated with activities that will impact on or be in the vicinity of coastal processes.
	Marine Environmental Quality	**Not applicable.** The Proposal is not associated with activities that will impact on or disturb any marine environments.
	Marine Fauna	**Not applicable**. The Proposal is not associated with activities that will impact on or disturb any marine environments.
Land	Flora and Vegetation	**Preliminary key factor.** No threatened or priority flora or threatened or priority ecological communities were identified within the DE based on a Detailed Flora and Vegetation Assessment (Emerge Associates 2024c). All potential indirect impacts can be mitigated through the implementation of environmental management plans during the required works associated with implementing the Proposal. There will be an impact of a maximum of 2.93 ha of native vegetation (2.89 ha in 'degraded' condition, 0.04 ha in 'good' to 'very good' condition) being cleared or materially disturbed. The environmental outcomes of the Proposal will be the clearing of 2.93 ha of native vegetation and clearing of scattered non-native vegetation on pastoral land for roads, turbines and associated infrastructure. Condition 15 of the DA requires the implementation of the approved Environmental Assessment and Management Plan prepared by Emerge Associates (**Appendix B**), which will manage the impacts to flora and vegetation. Residual impacts to flora and vegetation are not considered to be significant.

Table ES1: Consideration of environmental factors in relation to the Proposal

Theme	Factor	Relevance to Proposal
Land (cont.)	Landforms	**Not a key factor.** Distinctive landforms are not present within or adjacent to the Proposal based on the physical environment and therefore impacts at a landform scale are considered unlikely.
	Subterranean Fauna	**Not a key factor.** The DE is unlikely to contain habitat which supports subterranean fauna such as stygofauna (aquatic animals that inhabit groundwater in caves, aquifers and water-saturated interstitial voids) and troglofauna (air breathing animals that inhabit air-filled caves and smaller voids above the water table) that would be impacted by the activities that are to be undertaken as part of the Proposal. Significant groundwater drawdown and/or dewatering is not considered likely as part of the Proposal.
	Terrestrial Environmental Quality	**Not a key factor.** Terrestrial Environmental Quality is associated with the land use practices causing impacts to soil quality, including erosion, salinity, acid sulfate soils (ASS), agricultural practices such as large-scale irrigation or intensive cropping, and waste structures such as those for waste rock and tailing storage facilities. The Proposal will not result in activities that will impact soil quality. There is also a low risk of Acid Sulfate Soils (ASS) recorded in the areas based on the WA risk mapping (DWER 2023b). ASS are managed through Condition 15 of the DA which implements the approved Environmental Assessment and Management Plan prepared by Emerge Associates.
	Terrestrial Fauna	**Preliminary key factor.** A *Basic Fauna and Targeted Bird and Bat Assessment* was undertaken by Emerge Associates (2024b) and from this the likelihood of occurrence assessment identified one threatened (Carnaby's cockatoo), two specially protected (fork-tailed swift and peregrine falcon) and four priority fauna species with a 'high' or 'moderate' likelihood of occurrence. An *Avifauna Impact Risk Assessment* (Emerge Associates 2024a) (**Appendix E**) was conducted for Carnaby's cockatoo and fork-tailed swift, which indicated a 'low' risk of impact to either species. The primary direct impact to Carnaby's cockatoo will be the clearing of 0.04 ha and trimming of 0.19 ha of primary native foraging habitat at the Cowalla Road/Brand Highway junction to allow for the WTGs to be transported into the DE. All potential indirect impacts can be mitigated through implementation of environmental management plans during the required works. Minimal impact is expected to native vegetation habitat for fauna, and no impact to potential habitat trees with hollows. There will be a low risk to conservation significant and migratory species for bird and bat strike injury and mortality, a low risk of behavioural modifications in terrestrial fauna due to noise, and a low risk of disturbance and displacement of terrestrial fauna due to avoidance. There is a low risk of bat barotrauma. Condition 15 of the DA requires implementation of the approved Environmental Assessment and Management Plan which specifically includes an Avifauna Monitoring Programme and will manage impacts to terrestrial fauna. Residual impacts to Terrestrial Fauna are not considered to be significant.
Water	Inland Waters	**Not a key factor.** No surface water or groundwater features are identified within the DE or nearby that would be detrimentally impacted by the Proposal. Groundwater abstraction will be managed in accordance with the RIWI Act (only required for construction), and stormwater will be infiltrated locally and/or disposed via the local drainage network. There are no surface water features, such as wetlands (RAMSAR, Important Wetlands in Australia, geomorphic), rivers, creeks or man-made drains (or similar) within or directly adjacent to the DE (DBCA 2023a), and no features were identified as part of the investigations within the DE. The nearest surface water feature is Hill River which is 5 km to the north and east of the DE. No surface water features will be impacted by the Proposal. Condition 11 of the DA requires the preparation and implementation of a Surface Water Management Plan, applicable for the construction and operational phases of the Proposal.

Table ES1: Consideration of environmental factors in relation to the Proposal (continued)

Theme	Factor	Relevance to Proposal
Air	Air Quality	**Not a key factor.** A search for the nearest air quality monitoring site (at Quinns Rocks approximately 145 km south of the Proposal) and a review of available monitoring data indicates that the air quality in the general area is considered 'good' based on the Air Quality Index (AQI) (DWER 2023a). The main impact to air quality associated with the Proposal will be the potential temporary generation of dust during clearing and construction activities but will be dependent on weather conditions. Machinery and vehicles interactions with the soil and potential generation of dust can be mitigated through the use of commonly employed dust suppression measures such as water truck dust suppression, avoiding clearing and construction during periods of high wind and utilising hydromulch if the Proposal was to remain without surface cover for any period of time. The Proposal will not pose a risk to air quality, with dust able to be managed through the development application process, and the EPA objective for this factor can be met.
	Greenhouse Gas Emissions	**Not a key factor.** Greenhouse gas emissions from the construction and operation of the Proposal will not exceed EPA's Greenhouse Gas Emissions factor guidelines. Scope 1 emissions will be below 100,000 t CO_2-e annually and Scope 2 emissions will be below 100,000 t CO_2-e annually.
People	Social Surroundings	**Preliminary key factor.** <u>Cultural heritage considerations</u> A review of the Aboriginal Cultural Heritage Inquiry System (ACHIS) dataset did not identify any Registered Aboriginal Heritage Sites or Other Heritage Places within the DE. A review of the Australian Heritage Database, the State Heritage Office database, and the Local Heritage Survey indicated there are no state registered heritage sites located within the DE. The nearest known Aboriginal heritage site is 5 km from the DE. The Proponent has finalised Heritage Protection Agreement (HPA) and a Relationship Agreement with Yued and is undertaking a pre-construction cultural heritage assessment to ensure all cultural heritage values are known and captured within a Cultural Heritage Management Plan prepared cooperatively with Yued. <u>Shadow flicker and blade glint</u> A *Shadow Flicker and Blade Glint Assessment* (Aurecon 2024b) concluded that there would be a low impact from blade glint and that dwellings will experience shadow flicker within the allowable limits. Excess shadow flicker can be addressed using flicker timers. <u>Noise</u> A noise impact assessment was carried out for the proposed operational wind farm at 25 identified receiver points, and noise emissions were determined to comply with the noise criteria specified in EPA of South Australia *Wind Farms – Environmental noise guidelines– July 2009 Updated November 2021* for all surrounding noise sensitive premises, based on the background noise monitoring. Four (4) locations meet the 'stakeholder' premises criteria recommended by the SA Guidelines for such premises, and there are landowner agreements in place for these locations. The Proposal when operating will need to comply with the *Environmental Protection (Noise) Regulations 1997* at sensitive premises, and while additional modelling indicates that this can be achieved, the four locations that comply with the 'stakeholder' premises criteria under the SA Guidelines would be considered part of the noise emitting premises pursuant to the *Environmental Protection (Noise) Regulations 1997*.

Table ES1: Consideration of environmental factors in relation to the Proposal (continued)

Theme	Factor	Relevance to Proposal
People (cont.)	Social Surroundings (continued)	Condition 10 of the DA requires the preparation and implementation of a Noise Mitigation Plan to demonstrate that noise emissions will achieve compliance with the requirements of the in EPA of South Australia *Wind Farms – Environmental noise guidelines– July 2009, Updated November 2021*. The Proposal will need to comply with the *Environmental Protection (Noise) Regulations 1997* and the Noise Mitigation Plan will demonstrate this based on the extent of landowner/stakeholder agreements and the final layout accommodating any WTG micro-siting. <u>Visual amenity</u> *A Landscape and Visual Impact Assessment* (Emerge Associates 2024e) found no significant impacts to social surroundings are likely, and any impacts can be managed through positioning of the Proposal elements. <u>Consultation</u> The Proponent has undertaken consultation with a range of relevant individuals and organisations, including Federal and State Government Departments, the local government, Yued and the wider local community through a number of avenues including a number of open public forums. To date there have been no material issues, concerns or objections raised in relation to the Proposal or its implementation.
	Human Health	**Not applicable.** No radioactive substances or emissions are associated with the Proposal.

Table of Contents

List of Tables

List of Plates

Figures

Appendices

Appendix K

Shadow Flicker and Blade Glint Assessment

1. Proposal

1.1 Proposal content

1.1.1 Introduction

Zephyr Energy Pty Ltd (referred to herein as Zephyr or the 'Proponent') is proposing to develop the Parron Wind Farm in Badgingarra, Western Australia, approximately 8 km north-west of the Badgingarra townsite and 180 km north of the Perth Central Business District (CBD), herein referred to as 'the Proposal'. The Proposal Development Envelope (DE) comprises a total area of approximately 8,527.4 hectares (ha) as shown in **Figure 1**.

The Proposal is located on various lots within the Shire of Dandaragan, on freehold agricultural land adjacent to the existing Badgingarra Wind Farm. A summary of the Proposal is provided in **Table 1** and the Proposal content elements are described in **Table 2.**

1.1.2 Proposal description

Table 1: General Proposal content description

Proposal title	**Parron Wind Farm**
Proponent	Zephyr Energy Pty Ltd
Short description	The Proposal is for the development of a wind farm approximately 8 km to the north-west of Badgingarra, Western Australia. The Proposal is located on various lots within the Shire of Dandaragan (approximately 8,527.4 ha in size), on freehold agricultural land currently used for pastoral grazing and cropping, adjacent to the existing Badgingarra Wind Farm. A plan showing the location and extent of the Proposal is provided in **Figure 1**. The Proposal consists of a maximum of 79 Wind Turbine Generators (WTG) and associated infrastructure generating up to 489.8 MW. WTG will be spaced at least 500 m from each other and will be connected to an onsite substation. The Proposal will connect into Western Power's existing 330 kV transmission network (South West Interconnected System (SWIS)) line, which is located within and runs across the western side of the DE. The total indicative Disturbance Footprint (DF), inclusive of WTG, transmission lines, cables and substation, is approximately 491.54 ha. The Proposal and surrounding area is primarily utilised for low intensity agricultural uses and is largely already cleared. The Proposal has been intentionally designed to avoid disturbance to intact native vegetation. There will be minimal permanent impact to/loss of Carnaby's black cockatoo primary native foraging habitat within the DE (0.04 ha). Some trimming of primary native foraging habitat (0.19 ha) associated with the Cowalla Road/Brand Highway intersection works to allow the transportation of WTGs is necessary.

Table 2: Proposal content elements

Proposal element	Location / description	Maximum extent, capacity or range
Physical elements		
DE containing infrastructure: - Wind turbine hardstands for max 79 WTGs - Power supply – electrical cabling and upgrades - Substation - Switching station - Operation and maintenance facility - Concrete batching plant - Internal site access	Location and extent as shown in **Figure 1**.	DE: up to 8,527.4 ha Total DF: 491.54 ha
Vegetation clearing	Within the DF	The subject sites and surrounding area are primarily utilised for low intensity agricultural uses and are largely already cleared. The Proposal design has avoided areas of intact native vegetation and there will be minimal permanent impact to/loss of primary native foraging habitat (0.04 ha). There will be some trimming of primary native foraging habitat (0.19 ha) associated with the Cowalla Road/Brand Highway intersection works to allow the transportation of WTGs to the DE.
Construction elements		
Temporary construction infrastructure facilities - Site offices - Construction camps - Ablutions - Power and water supply - Storage/laydown - Parking and access points	Within the DE, final siting subject to detailed design	Construction will take approximately 24 months Construction activities comprise: - Bulk earthworks site clearing, excavation and backfilling to form access roads and WTG hardstands, laydown areas, benches for substations, O&M compound and storage areas. - Detailed excavation of WTG foundations and cable installation - Dewatering excavations where required - Steel fixing and concrete pouring to foundations (using onsite batch plants) - Access roads and hardstand pavement placement - Access road drainage installation (V drains, concrete pipe culverts and box culverts) - WTG component delivery, storage and erection using trucks, and various cranes - Substation construction (concrete foundations, slabs and bunds, underground services installation, erection of steel structures and installation of equipment, switch rooms, overhead cabling and perimeter fencing - Anticipated cultural heritage survey/monitoring as part of a Cultural Heritage Management Plan.
Fencing - Temporary and permanent security fencing requirements	Around substations and operation and maintenance facility	
Borrow pits	Source to be determined	
Water supply	Source to be determined	Water allocations necessary for constructions purposes will be subject to the Department of Water and Environmental Regulation (DWER) water extraction approval process. The project intends to explore opportunities to temporarily purchase existing water allocations rather than draw additionally from the aquifer. Provision of at least two 100,000 L water tanks available for firefighting.

Table 2: Proposal content elements (continued)

Proposal element	Location / description	Maximum extent, capacity or range
Operational elements		
Wind energy production	Within the DF	Up to 79 wind turbine generators Up to 489.8 MW in total
Maintenance	Within the DE	- Operating and maintenance staff on site during daylight hours (no permanent onsite presence) - Noise and environmental monitoring including bird mortality monitoring program, Carnaby's cockatoo bird strike, weed monitoring and management.
Proposal elements with greenhouse gas emissions		
Construction elements:		
Scope 1	Land use change (clearing of 491 ha of predominantly non-native vegetation): - up to 27,300.6 t CO2-e annually for 2-year construction period Estimate based on emissions factors in Transport Authorities Greenhouse Group (2013) Greenhouse Gas Assessment Workbook for Road Projects. Combustion of fuel for construction: - up to 908.9 t CO2-e annually for 2-year construction period Estimate based on Australian National Greenhouse Accounts Factors (NGAF 2022). Combustion of fuel for vegetation removal: - up to 266.1 t CO2-e annually for 2-year construction period Estimate based on Australian National Greenhouse Accounts Factors (NGAF 2022).	
Scope 2	Not applicable as there will be zero indirect emissions from the generation of purchased energy from a utility provider since all electrical power will be self-generated during construction.	
Scope 3	Scope 3 GHG emissions during construction are combined with operational emissions below.	
Operational elements:		
Scope 1	No significant ongoing Scope 1 emissions.	
Scope 2	No significant ongoing Scope 2 emissions.	
Scope 3	Turbine assembly (construction and operation) - up to 17,374.1 t CO2e annually for 40-year lifespan of turbines	
Rehabilitation		
The DE will be returned to the existing land use of farming within 24 months of the cessation of operations.		
Commissioning		
The Proposal has no environmental impacts specific to commissioning.		
Decommissioning		
The Proposal will either be repowered or decommissioned and returned to the existing land use of farming within 24 months of the cessation of operations. Likely decommissioning and remediation activities include: - Removal of all turbines, plant and equipment structures above ground - Removal of concrete foundations to 0.5 m below ground level - Return to predevelopment state excluding removal of access roads and inground cables - Removal and clean-up of any residual contamination - Decommissioning and Rehabilitation Plan maintained during the life of the developments and implemented at the end of the Wind Farms lifetime in consultation with the landowners		

Table 2: Proposal content elements (continued)

Proposal element	Location / description	Maximum extent, capacity or range
Other elements which affect extent of effects on the environment		
Proposal time*	Maximum project life	40 years At the end of life, the DE will either be repowered or decommissioned.
	Construction phase	Approximately 24 months
	Operations phase	Approximately 35 years
	Decommissioning phase	Approximately 24 months

1.1.3 Need for the Proposal

Mounting concerns over enhanced climate change arising from accumulating atmospheric greenhouse gases, and achieving the necessary emissions reductions, are the driver for installing renewable energy generation infrastructure. Wind farm development contributes to Western Australia's transition to a greater use of renewables, whilst providing the transmission of reliable and affordable energy to the South-West Interconnected System (SWIS).

Australia is committed to a single year target to reduce greenhouse gas emissions to 43% below 2005 levels by 2030, and a multi-year emissions budget from 2021-2030 (DCCEEW 2023a) The Australian Government is targeting 82% renewable energy in electricity grids by 2030 (DCCEEW 2023a). The WA Government has committed to reducing government emissions by 80% below 2020 levels by 2030 and is procuring a range of energy initiatives including renewable energy (DWER 2024a). The Proposal contributes to the National and State Governments' objectives for sustainable production of energy and commitments to reduce greenhouse gas emissions.

1.1.4 Purpose of this referral

The purpose of this document is to support Zephyr Energy's referral of the Proposal to the EPA. This referral has identified the key EPA factors as Flora and Vegetation, Terrestrial Fauna and Social Surroundings.

1.2 Proposal alternatives

Planning and implementation of renewable/wind energy generation proposals require that the proposed location meets several factors. For the Proposal this includes:

- High and consistent wind speeds
- Preferably low vegetation cover
- Preferably sparse residential dwellings and surrounding sensitive receptors
- Reasonable road access
- Suitable network connections in close proximity to the proposed generation.

The DE meets all the above requirements and preferences as a suitable site for a proposed wind farm development. Additionally, the Proponent involves the landowner of the site, thereby providing a

clearer basis to resolve land access and avoid the need for negotiation with other landowners with regards to allowing wind farm development to proceed on their properties.

Having been included in the original Badgingarra Wind Farm proposed action/proposal meant that a proposed wind farm layout had been previously considered in relation to the DE's environmental conditions and acceptability through the historic referral of the Badgingarra Wind Farm pursuant to the EPBC Act.

Given the historic assessments for the Badgingarra Wind Farm, combined with the current site conditions and Proposal design, there was a clear opportunity to avoid impacts to MNES and also deliver a major renewable energy generation project that could be progressed rapidly to meet the broader renewable energy generation goals and needs relevant for Western Australia.

1.3 Local and regional context

1.3.1 Climate

The Wheatbelt region of Western Australia experiences a Mediterranean climate with hot dry summers and cool wet winters (Hobbs 2003). The closest weather station to the DE is Badgingarra Research Station (009037) which is approximately 15 km east of the DE. Recent rainfall at the weather station has been lower with long term averages as shown in **Plate 1** (BoM 2024). The average morning (9am) wind speeds are consistently lower than afternoon (3pm) windspeeds and are both higher in summer than winter as shown in **Plate 2**.

Flora and vegetation surveys are undertaken during the season that is most suitable for detection and identification of the range of flora likely to occur in the area (EPA 2016c). For the 'south-west and interzone' botanical province in which the DE lies, the primary survey time is spring (September to November) (EPA 2016c).

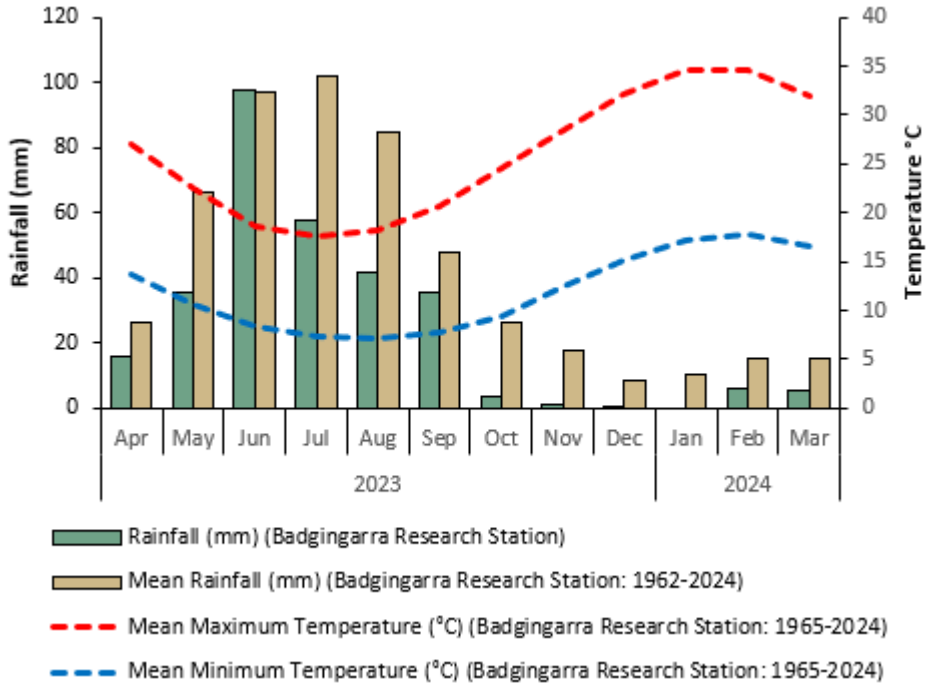


Plate 1: Recent rainfall and long-term mean temperature and rainfall

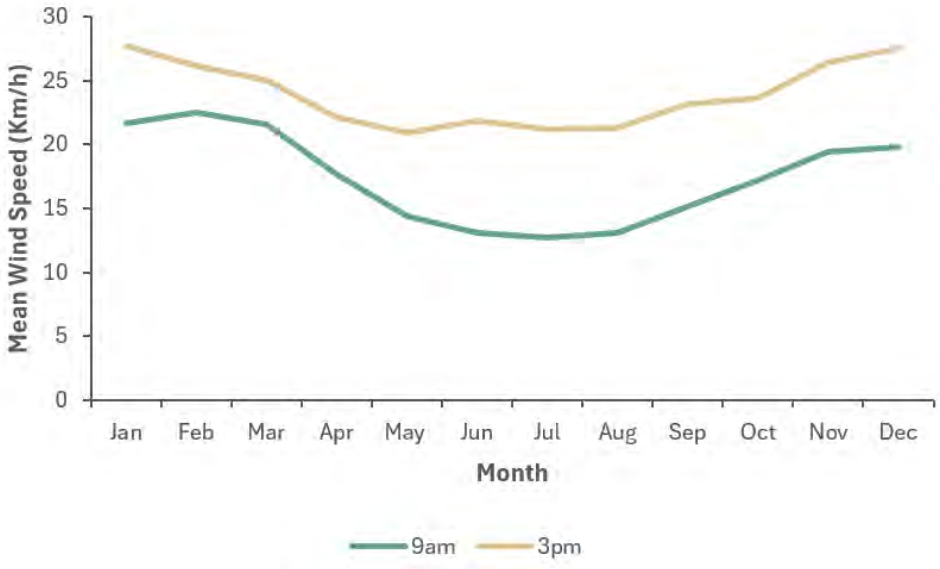


Plate 2: Mean 9am and 3pm wind speeds

1.3.2 Geomorphology, landforms and soils

The DE occurs on the Geraldton Sandplains in the Lesueur Sandplain subregion, which is the geomorphic unit that characterises the region from Dongara in the north, to Greenhead in the south and inland to Badgingarra.

The Geraldton Sandplains comprises three subregions: Edel, Geraldton Hills and Lesueur Sandplains, which stretch from the south end of the Carnarvon basin to the northern areas of the Perth Basin

and Pinjarra Orogen (CALM 2003). The region is characterised by an undulating lateritic sandplain mantling Permian to Cretaceous strata with areas of coastal aeolian sands and limestone. Alluvial outwash plains exist in areas of valleys and hills (Purdie *et al.* 2004).

Fine scale soil landscape mapping by DPIRD (2022a) shows nine (9) units as occurring within the DE, as described in **Table 3** and illustrated in **Figure 2**. The DE is not known to contain any restricted landforms or unique geological features.

The most abundant system covering the majority of the DE is the Yerramullah 3 Subsystem. This comprises colluvial slopes and some plateau remnants, very gently to gently inclined hillslopes and sand filled minor valleys; pale and yellow deep sands, pale sandy gravels, shallow gravel over duricrust, some sandy duplexes and sandy earths.

Table 3: Soil landscape mapping units within the DE (DPIRD 2022a)

Soil landscape unit	Location within DE	Description
Yerramullah 1 Subsystem	Two patches in the central and southeastern portion	Laterite plateau residual; shallow gravel, shallow sand over duricrust, sandy gravels
Yerramullah 2 Subsystem	Many patches scattered throughout much of the DE	Plateau residuals, very gently to gently inclined hillcrest and hillslopes; pale sandy gravels, shallow gravel over duricrust, gravelly pale deep sand, pale and yellow deep sands
Yerramullah 3 Subsystem	Most abundant system covering the majority of the DE	Colluvial slopes and some plateau remnants, very gently to gently inclined hillslopes and sand filled minor valleys; pale and yellow deep sands, pale sandy gravels, shallow gravel over duricrust, some sandy duplexes and sandy earths
Yerramullah 4 Subsystem	Two patches in the north-western portion	Plateau residuals, complex of Ye2 and Ye3; pale sandy gravels, gravelly pale deep sand, shallow gravel over duricrust, pale deep sand, some sandy duplexes, yellow deep sand
Yerramullah 6 Subsystem	One patch in the south-eastern portion	Colluvial slopes, very gently to gently inclined mid to lower hillslopes and sand filled minor valleys; pale deep sand, some sandy duplexes and shallow sand over pan or bog iron
Yerramullah 9 Subsystem	One patch in the south-western portion	Narrow alluvial flats of minor creeks; pale to brown deep sands, sandy and loamy duplexes, shallow sand over pans
Mintaja Hills System	One patch in the north-western portion	Rises and low hills on sedimentary rocks north and south of the Mount Lesueur area. Variable soils including red/brown non-cracking clays, brown loamy earths, and grey/brown shallow loamy duplexes. Woodlands.
Nylagarda 1 Subsystem	One patch in the north-eastern portion	Drainage line and adjacent very gently inclined footslopes; mainly sandy duplexes, brown deep sand and brown sandy earth
Yerramullah 11 Subsystem	One patch in the south-western portion	Rises and slopes in areas of regional groundwater discharge, possible fault zones; soils high in iron

1.3.3 Topography

The elevation of the DE ranges from 94 metres in relation to the Australian Height Datum above sea level (mAHD) in the north-western corner, to 278 mAHD in the center to south-western corner of the DE (DoW 2008). Topographic contours in the DE and in the adjacent area are shown in **Figure 2**.

The DE mostly comprises colluvial slopes and some plateau remnants, very gently to gently inclined hillslopes and sand filled minor valleys.

1.3.4 Hydrology and hydrogeology

The DWER Water Register (DWER 2021) indicates the DE falls within the Jurien Groundwater Area and the Badgingarra Groundwater Subarea, and the Yarragadee aquifer. The Yarragadee aquifer is a major freshwater resource in the Badgingarra Groundwater Subarea which is capable of supplying bore yields of >5000 kL/day. The Jurien Groundwater Area is an area proclaimed for licensing under the *Rights in Water and Irrigation Act 1914* (RIWI Act), which thereby requires that a 5C licence is obtained to abstract water for construction purposes. The 5C groundwater licence allows the licence holder to take a specified amount of water from the proclaimed area, water that may be transferred to another user, traded or leased, subject to approval. The 5C groundwater licence would be considered a temporary groundwater usage, which includes any activity with a set timeframe associated with the activity.

There are eight (8) groundwater bores/wells (some historic) located within the DE, one of which provides details on the depths to groundwater across the DE (**Figure 3**). Since 2002 the groundwater level at bore AWRC Ref 61718041 in the north of the DE has plateaued between 129 mAHD and 131 mAHD which is at ground level where the sampling location is (ground level approximately 124-130 mAHD) and there is a wetland present in the area. Prior to 2002 the groundwater level increased from approximately 116 mAHD in 1972 up to approximately 129 mAHD in 2002. No regional groundwater level mapping is available for the DE.

The DE is within the Hill River Catchment area. The Hill River, a major tributary, is located outside the DE to the north before continuing westward of the DE. Multiple minor tributaries of the Hill River intersect the DE. The Hill River flows from Badgingarra westward for about 85 km to the Indian Ocean discharging to the nearshore environment south of Jurien Bay. The majority of the Hill River catchment area is used for agriculture, predominantly grazing and cropping, including within the DE. The Hill River and tributaries catchment, as mapped by the DWER, is gazetted as a Proclaimed Surface Water Area allowing for the commercial use of water under a license as set out in the RIWI Act. The RIWI Act's purpose is to regulate the taking of water from watercourses and wetlands.

Wetlands are areas of seasonally, intermittently or permanently waterlogged land such as poorly drained soils, ponds, billabongs, lakes, swamps, tidal flats, estuaries, rivers and their tributaries (Wetlands Advisory Committee 1977). Wetlands can be recognised by the presence of vegetation associated with waterlogging or the presence of hydric soils such as peat, peaty sand or carbonate mud (Hill *et al.* 1996).

Wetlands of national or international significance may be afforded special protection under Commonwealth or international agreements. Review of the *Ramsar List of Wetlands of International Importance* (DBCA 2017a) and *A Directory of Important Wetlands in Australia – Western Australia* (DBCA 2018) indicates that no Ramsar or listed 'important wetlands' are located within or near the DE.

The DWER hydrography linear dataset (DWER 2018) records the following 43 wetland or surface water related features within the DE:

- 16 earth dams,
- 18 watercourses, all of which are minor and non-perennial
- Nine unnamed hydrological features.

The *Geomorphic Wetlands, Cervantes Eneabba (DBCA-015)* dataset (DBCA 2024) identifies wetland features and classifies them based on their landform shape and water permanence (DBCA 2023b). Each wetland feature is classified according to their host landform and hydroperiod.

A review of the *Geomorphic Wetlands, Cervantes Eneabba* dataset indicated that one dampland wetland feature (Unique Feature Identifier (UFI) 581) occurs within the central northern part of the DE and one non-classified wetland feature (UFI 258) occurs in the south-western part of the DE (DBCA 2023b). The locations of the geomorphic wetlands and hydrological features in the DE are shown in **Figure 3**.

1.3.5 Regional biography

The DE is contained within the Geraldton Sandplains IBRA region and within the 'GES02' or Lesueur Sandplain subregion. The Geraldton Sandplains region (previously 'Northern Sandplains' region) is described as comprising mainly 'scrub heath on sandplain near the coast, Acacia to Casuarina thickets further inland and Acacia scrub with scattered trees of *Eucalyptus loxophleba* on hard-setting loams' (Beard 1990).

Variations in native vegetation can be further classified based on regional vegetation mapping. Beard *et al.* (2013) mapping shows the majority of the DE as comprising vegetation association 'Le Sueur_1031' which is described as 'scrub-heath or heath'. A small portion in the north-east of the DE is mapped as comprising the 'Le Sueur_1034' vegetation association which is described as 'woodland' (Beard *et al.* 2013)

The 'Le Sueur_1031' association was determined to have 34.48% of its pre-European extent remaining in the Geraldton Sandplains region in 2017, with 14.72% protected for conservation purposes. The 'Le Sueur_1034' association was determined to have 61.90% of its pre-European extent remaining with 36.73% protected for conservation purposes (Government of Western Australia 2018).

1.3.6 Environmental values

The Department of Biodiversity, Conservation and Attractions (DBCA) has tenure of, or interests in, numerous areas of land across the state for a range of purposes. Tenure categories include national parks, nature reserves, conservation parks, marine parks, marine nature reserves, marine management areas, section 5(1)(g) reserves, state forest and timber reserves. These areas are mapped within the *Legislated Lands and Waters* (DBCA 2023c) and *Lands of Interest* (DBCA 2022) datasets. The *Legislated Lands and Waters* (DBCA 2023c) dataset includes lands subject to the *Conservation and Land Management Act 1984* (CALM Act 1984), *Swan and Canning Rivers Management Act 2006* (SCRM Act) and lands identified under the *Land Administration Act 1997* (LA Act). The *Lands of Interest* (DBCA 2022) dataset includes all other lands of which DBCA is recognised as the manager but is not vested under any act.

Two DBCA managed or legislated lands occur immediately adjacent to the DE. Badgingarra National Park (R31809), reserved for Conservation, lies adjacent to the entire southern boundary of the DE and extends to the south and east. Hill River - Twyata Nature Reserve (R36093), also reserved for Conservation, lies adjacent to the north-eastern corner of the DE and extends to the north-west and south-east (DBCA 2023c). The locations of both DBCA legislated or managed lands are shown in **Figure 3.**

The Badgingarra National Park was established in 1973. The National Park is approximately 17,600 ha of mostly low scrub with a high diversity of endemic vascular plants. Fauna such as western grey kangaroos, emus, bustards and wedgetail eagles inhabit the National Park. The Twyata Nature Reserve is a Class C reserve vested in the Conservation Commission for the purpose of 'Conservation of Flora and Fauna'. It is approximately 205 ha in size with a diverse landscape of native vegetation and flora.

1.3.7 Land use

The DE is within the Shire of Dandaragan and is located 8 km north-west of the town of Badgingarra. The DE's land use zoning is rural under the Shire of Dandaragan's Local Planning Scheme No. 7.

A review of historical aerial photography available from 2000 onwards shows that the majority of the DE was cleared of native vegetation prior to 2000, likely for grazing and/or cropping uses. Since this time the extent of native vegetation within the DE has remained relatively stable (WALIA 2024). The earliest available aerial imagery shows that the surrounding areas have also supported agricultural land uses since before 2000.

The DE is immediately adjacent to the Badgingarra National Park which is reserved Conservation and the Twyata Nature Reserve (Hill River) which is also reserved Conservation through the Shire of Dandaragan's Local Planning Scheme No. 7.

The existing use of the DE is primarily agriculture (8,392 ha) and has been used for pastoral grazing and cropping.

The future use of the land will remain agriculture (7,982 ha) and proposed wind farm activities (491 ha). Clearing and ground disturbance for the new wind farm will predominantly involve disturbance of non-native vegetation on existing pastoral land, with the existing intact remnant native vegetation (native vegetation in 'good' or better condition) to be avoided and retained. The zoning of the DE will remain rural.

Existing wind farm operations (and a proposed wind farm) adjacent and nearby to the DE include Badgingarra Wind Farm, Emu Downs Wind Farm, Waddi Wind Farm (proposed), Yandin Wind Farm and Warradarge Wind Farm. Each of these wind farms are also zoned rural and retain the agricultural use of the majority of the land.

1.3.8 Aboriginal heritage

Noongar people are the Traditional Owners of the south-west of Western Australia, which incorporates the DE. The Proposal occurs across the South West Settlement Native Title, and within the Yued region.

In Western Australia, Aboriginal cultural heritage is currently identified pursuant to the *Aboriginal Heritage Act 1972* (AH Act), which provides a framework for the recognition, protection, preservation and management of Aboriginal heritage. The Act requires approval for activities that may impact or harm Aboriginal heritage. The DPLH maintain the Aboriginal Cultural Heritage Inquiry System (ACHIS), which is a directory containing locations and information about Aboriginal Cultural Heritage (ACH) in the state.

In accordance with the *Aboriginal Heritage Due Diligence Guidelines* (DAA 2013), a search of the AHIS online database (DPLH 2023) was undertaken which did not identify any Registered Aboriginal Heritage Sites or Other Heritage Places within the DE.

The closest Registered Aboriginal Cultural Heritage Place in proximity to the DE is JB1 SITE (Place 17118), which is approximately 5 km to the east near the Brand Highway. This ACH place is not identified as being culturally sensitive and is classified as a Camp.

The Proponent has finalised a Heritage Protection Agreement (HPA) and a Relationship Agreement with Yued and is currently progressing a cultural heritage assessment to ensure all cultural heritage values are known and captured within a Cultural Heritage Management Plan prepared cooperatively with Yued.

1.3.9 Non-indigenous heritage

In order to determine the actual or potential presence of sites or features of non-indigenous heritage significance within the DE, a review of the Australian Heritage Database (DCCEEW 2022a), the State Heritage Office database (Heritage Council WA 2022) and the Local Heritage Survey (DPLH 2020) was undertaken to determine if any of the following occur within the DE:

- World Heritage Sites
- National Heritage Sites
- Commonwealth Heritage Places
- Sites listed in the State Register of Heritage Places.

The desktop search has indicated there are no state registered heritage sites located within the DE.

Nearby sites were identified using the Local Heritage Survey (DPLH 2020). Cattle Yards near Hill River on Cantabilling Rd Badgingarra, North of Hill River (Heritage Place No. 5832) is 6 km to the north of the DE. Badgingarra Research Station (Herbert Sudholt's Farm) on Winjardie Rd Badgingarra (Heritage Place No. 5828) is 10 km to the east of the DE.

1.3.10 Other developments

In close proximity to the DE are several existing operational wind farms and one proposed windfarm, namely Badgingarra Wind Farm, Emu Downs Wind Farm, Waddi Wind Farm (proposed), Yandin Wind Farm and Warradarge Wind Farm. Badgingarra Wind Farm completed construction in 2019 and operates 37 WTGs immediately to the west of the DE, west of Yellamullah Rd. Immediately 5 km to the south of this is Emu Downs Wind Farm that has operated 48 WTG since 2006. Approximately 30 km south-east of the DE is the proposed Waddi Wind Farm with up to 18 turbines, and approximately 50 km south-east of the DE is the Yandin Wind Farm with 51 turbines that opened in

2021. Warradarge Wind Farm, near Eneabba, was completed toward the end of 2020 and has a total of 51 turbines.

2. Legislative Context

2.1 Environmental impact assessment process

2.1.1 Environmental Protection Act 1986

The Proposal is being referred under Part IV of the *Environmental Protection Act 1986* (EP Act) which is the primary legislative instrument for environmental protection and impact assessment in Western Australia (WA). The EP Act and associated administrative procedures specify procedures for assessment and appeal processes, including responsibilities and functions of the WA Minister for the Environment and the EPA. Under Part IV of the EP Act, the EPA is responsible for providing advice to the Minister for significant proposals assessed under Part IV of the EP Act.

Where a proposal is subject to formal environmental impact assessment (EIA), the Proponent needs to demonstrate that:

- Best practicable measures have been taken in planning and designing the proposal to avoid, and where this is not possible, to minimise impacts on the environment.
- The unavoidable impacts of the proposal are environmentally acceptable, considering cumulative impacts which have already occurred in the region, and principles of sustainability.

The EPA uses environmental principles, factors and associated objectives as the basis for assessing whether a proposal's impact on the environment is acceptable. The preliminary key environmental factors relevant to the Proposal are detailed further in subsequent sections, and include:

- Flora and vegetation
- Terrestrial fauna
- Social surroundings
    - Aboriginal heritage
    - Non-indigenous heritage
    - Visual amenity
    - Shadow flicker and blade glint
    - Noise.

Other non-key EPA factors to be considered include:

- Landforms
- Subterranean fauna
- Terrestrial environmental quality
- Inland waters
- Air quality
- Greenhouse gas emissions
- Human health.

Under the EP Act it is an offence to clear native vegetation unless the clearing is done in accordance with a clearing permit, or an exemption applies. 'Native vegetation' is defined in s 3(1) and 51A of the EP Act and Regulations as follows:

Indigenous aquatic or terrestrial vegetation, that includes dead vegetation unless that dead vegetation is of a class declared by regulation to be excluded from this definition but does not include vegetation in a plantation.

Native vegetation does not include vegetation that was intentionally sown, planted or propagated (even if this involves indigenous terrestrial plant species), although natural regeneration of previously areas would constitute native vegetation. Clearing vegetation that is not native vegetation, for the purposes of the EP Act, can be cleared without requiring a clearing permit or exemption.

2.1.2 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places (among others), which are defined as 'Matters of National Environmental Significance' (MNES). The EPBC Act protects listed MNES, and it is an offence to implement any action that would have a significant impact on any MNES. If an action is likely to have a significant impact upon a protected matter, then it must be referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Under the EPBC Act, an action will require approval from the Minister if the action is deemed to be a Controlled Action (likely to have, has had or will have a significant impact). This assessment is undertaken by DCCEEW, guided by the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (Department of the Environment 2013).

The Proponent has referred the Proposal pursuant to the EPBC Act.

2.2 Other approvals and regulation

In addition to the EP Act and EPBC Act, the Proposal will be subject to compliance under other state legislation and guided by relevant policy and guidance documents. **Table 4** provides an outline of the other relevant legislative requirements and the extent to which impacts can be managed and the EPA objectives can be achieved.

Table 4: Decision-making authorities and processes relevant to the Proposal

Decision making authority	Legislation or Agreement	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment?
Minister for Environment Department of Water and Environmental Regulation (DWER)	*Rights in Water and Irrigation Act 1914* (RiWI Act)	26D licence to construct well 5C licence to take groundwater	RiWI Act licensing assesses and manages the abstraction of ground and surface water. If new bores (or the modification of existing bores) are required, the appropriate licences will be applied for.
Department of Planning, Lands and Heritage (DPLH) Shire of Dandaragan	*Planning and Development Act 2005* (PD Act) Planning and Development (Local Planning Schemes) Regulations 2015 *Shire of Dandaragan Local Planning Scheme No.7*	Development Approval	The development application process considers conflicting and compatible land uses and is particularly relevant to the assessment of Social Surroundings, as well as Inland Waters and Terrestrial Environmental Quality. A development application was lodged with the Shire of Dandaragan prior to the EP Act referral and the Development Approval (DA) has been issued with conditions. The PD Act and LG Act provide a range of statutory approval mechanisms to avoid, mitigate and manage environmental impacts when making decisions on changes in land use, subdivision, development applications, building and works and carrying out municipal activities. Planning decisions must have due regard for statutory State Planning Policies (SPPs) pursuant to the PD Act, as well as local polices. The Proposal is subject to the DA and its conditions (**Appendix A**). The DA was lodged with the Shire of Dandaragan and assessed by the Shire. As it relates to the EPA's objectives the decision maker must have due regard for: • the purpose and intent of the local planning scheme • orderly and proper planning, including consideration of the Shire of Dandaragan Local Planning Scheme No.7 • preservation of amenity • SPPs and any other relevant policies • any other matters in the public interest. The DA conditions of approval ensure the development addresses environmental matters, including protection and management of native vegetation and fauna habitat, environmental management, landscaping, and bush fire. Specifically, the DA has been issued with the following relevant conditions:

Table 4: Decision-making authorities and processes relevant to the Proposal (continued)

Decision making authority	Legislation or Agreement	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment?
			• The approved wind turbines may be micro-sited within a 300 m radius of the turbine locations on the endorsed development plans. Prior to the commencement of construction, amended development plans, including the final siting of wind turbine locations, shall be submitted to and approved by the Shire of Dandaragan. • Noise from the operational approved development shall not exceed more than 5dB(A) above the background noise level or 35dB(A) (using LA90), whichever is the greater, at surrounding noise sensitive premises located outside the approved development boundary unless the noise sensitive premises is the subject of a neighbour waiver agreement with the relevant landowner, for which 30dB(A) indoors and 45dB(A) outdoors shall not be exceeded. • Prior to the commencement of construction, an updated Noise Mitigation Plan shall be submitted to and approved by the Shire of Dandaragan in consultation with the Department of Water and Environmental Regulation and thereafter implemented for the life of development to the satisfaction of the Shire of Dandaragan. • Prior to the commencement of construction, Surface Water Management Plans (applicable for the construction and operational phase of the project) that incorporates appropriate design methods to manage water erosion from intense summer and/or winter rainfall events, shall be submitted to and approved by the Shire of Dandaragan in consultation with the Department of Primary Industries and Regional Development. • Prior to the commencement of construction, a Land Rehabilitation Plan is to be submitted to and approved by the Shire of Dandaragan in consultation with the Department of Primary Industries and Regional Development, to address the rehabilitation of agricultural land after initial construction. The Decommissioning and Land Rehabilitation Plan is to be implemented to the satisfaction of the Shire of Dandaragan. • The proponents shall develop and implement a post construction noise monitoring program at the noise sensitive receptors to assess compliance of the operational approved development with the noise limits. The postconstruction noise monitoring program shall be conducted at the same time of year as when the background noise measurements were recorded. Results of the program shall be forwarded to the Department Water and Environmental Regulation Noise Branch. • Prior to the approved development being decommissioned, a Decommissioning and Rehabilitation Management Plan is to be submitted to and approved by the Shire of Dandaragan. The Decommissioning and Rehabilitation Management Plan should address the removal of above ground plant and equipment (excluding concrete pads, footings and inground cables) in order to return the lots to their pre-development state. The Decommissioning and Rehabilitation Management Plan is to be implemented to the satisfaction of the Shire of Dandaragan.

Table 4: Decision-making authorities and processes relevant to the Proposal (continued)

Decision making authority	Legislation or Agreement	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment?
			• The applicant is to implement to the satisfaction of the Shire of Dandaragan the approved Environmental Assessment and Management Plan prepared by Emerge Associates and dated October 2024 for the life of approved development (**Appendix B**). • The applicant is to implement to the satisfaction of the Shire of Dandaragan the approved Bushfire Management, Risk Management, and Bushfire Emergency Response Plans prepared by Emerge Associates and dated October 2024 for the life of approved development.

3. Stakeholder engagement

3.1 Key stakeholders

The Proponent commenced engagement with stakeholders in September 2021. Consultation with project stakeholders has included those listed in **Table 5**.

Table 5: Project stakeholders who have been consulted

Date	Project Stakeholders	Meeting	Objective
Shire of Dandaragan			
25/07/2024	Councillors & Executive		Pre DA submission briefing
25/07/2024	Executive Manager of Infrastructure	Brad Pepper	Infrastructure - Port & Roading
25/07/2024	Executive Manager Corporate and Community Services	Brad Waters	Community Investment Expectations
27/08/2024	Executive Manager Corporate and Community	Brad Waters	Project Briefing
26/09/2024	Executive Manager of Development Services	Louis Fouche	Introduction to Atmos Renewables
	Principal Planning officer	Rory MacKay	
	Executive Manager of Infrastructure	Brad Pepper	
Shire of Moora			
26/09/2024	CEO	Gavin Robbins	Community Benefit
	Councillor	Tracey Le Froy	
Members of Parliament			
28/08/2024	Federal MP (Seat of Durack)	Melissa Price, MP	Project Briefing
Agricultural Region Electorate			
28/08/2024	Leader of the Opposition & Nationals WA	Shane Love	Project Briefing
28/08/2024	Member for the Agriculture Region Parliamentary Secretary to the Minister for Energy; Environment; Climate Action	Hon Darren West, MLC	Project Briefing
2/09/2024	Member for the Agriculture Region, Shadow Minister for Housing; Forestry; Planning; Lands	Hon Steve Martin MLC	Project Briefing
Key Ministers/Portfolio			
July	Minister for Energy; Environment; Climate Action	Rachelle Gill, Senior Policy Advisor	Project briefing
28/08/2024			Introduction to Atmos Renewables

Table 5: Project stakeholders who have been consulted (continued)

Date	Project Stakeholders	Meeting	Objective
Farming/Business/Community Associations			
19/08/2024	West Midlands Growers Association (Dandaragan)	Nathan Craig, CEO	Project briefing
27/08/2024	Mid-West Ports	Damian Tully CEO	Introduction to Atmos Renewables Port Capacity
5/09/2024	Wheatbelt Development Commission	Renee Manning, A/CEO	Project briefing - Community Benefit
27/08/2024	Mid West Development Commission	Nils Hay, CEO	Introduction to Atmos Renewables
19/10/2024	Jurien Bay	Community members	Community forum
19/10/2024	Badgingarra	Community members	Community forum
Government and Servicing Agencies			
26/09/2024	Department of Local Government, Sport and Cultural Industries (DLGSC)	Troy Jones & Samantha Cornthwaite	Community benefit approach
1/08/2024	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Jai Thomas, Deputy Director General Energy	Project briefing
23/10/2024	Department of Water Environmental Regulation (DWER)	Belinda Walker, Executive Director Green Energy	Advice on referral to EPA
26/6/2024	Department of Climate Change, Energy, the Environment and Water (DCCEEW)	DCCEEW officer	Discuss potential impacts associated with Proposed Action, impact avoidance approach and EPBC Act referral.
6/09/2024	Department of Primary Industry and Regional Development (DPIRD)	Felicity Gilbert, Manager Strategic Projects	Project briefing - housing in regions
		Susan Corbiserios	
25/11/2024		Tim Overheu	Comments provided on agricultural and resource management elements associated with the Development Approval
22/07/2024	Department of Jobs, Tourism, Science and Innovation (JTSI)	Sunny Singh, Project Manager, Green Energy Major Projects	Project briefing
22/07/2024	Powering WA	Brooke Eddington, Assistant Director, Planning and Analytics	Project briefing

Table 5: Project stakeholders who have been consulted (continued)

Date	Project Stakeholders	Meeting	Objective
28/08/2024		Wenona Hadingham and Jodi Cook	Introduction to Atmos Renewables Community Benefit
29/08/2024	Telstra	Ian Pollock, WA/NT Local Relationship Manager	Telecommunications for the Parron site
16/07/2024	Western Australian Planning Commission (WAPC)	David Caddy, Chair	Project briefing
Heritage			
8/08/2024	Yued Aboriginal Corporation	Yued Cultural Advisory Committee	Project briefing and discussion regarding proposed heritage agreement, cultural heritage assessment, and cultural heritage management processes.
5/12/2024		Members of Yued community Moora and Perth Yued with Yued officers	Site visit and discussion of cultural heritage and future Yued participation in the project. Discussion of water, birds and other matters of significance.
25/12/2024		Yued officers	Discussed community benefits capacity building and considerations relating to the development in the site location.
17/10/2024		Yued Board	Presented project and discussed Yued advice about Yued values and priorities.
TBC		Yued Officers Moora	Meeting to engage on social surroundings
Neighbours			
From 22/09/2021	WTG Hosts	In person, email and phone calls	Option to lease, lease agreement, positions of WTG on property
From 22/09/2021	Near neighbours	In person, email and phone calls	Neighbour (i.e. landowner/stakeholder) deed/agreement for noise management considerations.

3.2 Stakeholder engagement process

Strategic engagement with stakeholders was initiated prior to the EPA referral, EPBC Act referral and DA submission. The Proponent's objectives for strategic engagement included:

- Proactive, timely and transparent engagement to enhance the reputation of the Proponent and the Proposal, mitigating potential impacts to project schedule and project costs.
- Establish relationships with regulators and community representatives, ahead of construction phase and related approvals.
- Constructive engagement with government and officials, contributing to evolving policy for Green Energy Approvals and Shared Community Benefit frameworks.
- Provide insights into complimentary land use in agriculture, with a single landowner on a freehold property, derisking farming operation.

- Development and deployment of engagement materials briefing notes, presentation packs, etc.

Stakeholder consultation has been undertaken to support the DA public advertising process, where the application information has been made available to the various stakeholders in accordance with the PD Act (and associated regulations). The advertising process requires the proponent to respond to any concerns raised by government agencies or the local community through public submissions. This will allow relevant stakeholders including those identified above to engage as the Proposal progresses.

Mechanisms used to engage stakeholders have included:

- Project briefings and meetings
- Letter correspondence
- In person meetings
- Telephone conversations
- Direct email
- Community forum/information sessions.

Consultation with the Yued Aboriginal Corporation (Yued) on cultural heritage and the related social surroundings considerations has been key to the stakeholder engagement process. The Proponent has acknowledged that heritage monitors will be required and will be requested through Yued. The Proponent has signed a Heritage Protection Agreement (HPA) and will prepare and implement a Cultural Heritage Management Plan that forms part of the HPA. Additionally, for the decommissioning process, there will be a Decommissioning Plan that will form part of the ongoing communications with Yued, enabled through a Relationship Agreement.

Any Proposal modifications will be communicated to Yued Aboriginal Corporation, including variations to project layout following the DA, including any impacts to native vegetation. This information is to be shared with Yued under the Relationship Agreement. Project updates following the DA are to be shared with Yued Activity Committee (YAC) Working Group until the Relationship Agreement is fully implemented. The Surface Water Management Plan (to address Condition 11 of the DA) and any recommendations and/or outcomes of the EP Act (State) and EPBC Act (Federal) environmental processes will be shared with the YAC Working Group and included in the Relationship Agreement.

3.3 Stakeholder consultation outcomes

Table 6 provides a summary of key stakeholder consultation outcomes in relation to the Proposal.

Table 6: Stakeholder consultation outcomes

Stakeholder	Date	Issues /topics raised	Outcome
Various surrounding landowners	From 22/09/2021	Landowner agreements for those in proximity to proposed WTG locations.	Finalised landowner (stakeholder) agreements.
DCCEEW	26/06/2024	Discuss impacts associated Proposed Action and proposed EPBC Act referral.	Risk assessment undertaken for impacts on MNES, used to inform impact significance assessment and supporting EPBC Act referral.
DWER	23/10/2024	Advice on referral to EPA	Avoidance approach for impacts on key environmental factors and captured in the Proposal and as documented in this referral.
DWER – Environmental Noise Branch	21/11/2024	Noise management	The *Environmental Protection (Noise) Regulations 1997* will apply to the operational of the Proposal, and the SA Guidelines are for additional consideration/guidance for the planning approval assessment. A Noise Mitigation Plan will be prepared as Condition 10 of the DA and will demonstrate this. The landowners that do not have turbines situated on their properties but have landowner (stakeholder) agreements in place would be considered part of the noise emitting premises pursuant to the *Environmental Protection (Noise) Regulations 1997*, and following further micro-siting it will be demonstrated that compliance with the *Environmental Protection (Noise) Regulations 1997* will be achieved.
Yued Aboriginal Corporation	Multiple and ongoing	Agreements for ongoing engagement and relationship with Yued and the Proponent, cultural heritage assessment and management.	Finalisation of Heritage Protection Agreement (HPA) and Relationship Agreement, commencement and progression of cultural heritage assessment and commitment to prepare Cultural Heritage Management Plan.

4. Environmental Principles and Factors

4.1 Principles

In accordance with EPA's *Statement of environmental principles, factors, objectives and aims of EIA* (EPA 2021), this section has considered both the principles of the EP Act and the environmental factors, and how these apply to the Proposal.

The principles are outlined in **Table 7**. A preliminary review of the EPA's factors with regard to the Proposal is detailed in **Table 8.** Consideration of the environmental factors has been informed by a desktop analysis of available information, detailed field investigations and consideration of the Proposal development process resulting in the current Proposal as presented in this referral, and has helped narrow those factors to be assessed in detail.

Based on the assessment of EPA's environmental factors, Flora and Vegetation, Terrestrial Fauna and Social Surroundings have been identified as the preliminary key factors that require further consideration in relation to the significance of potential impacts. These factors have been considered in further detail in **Section 5**, **Section 6** and **Section 7**, respectively. The remaining factors are not considered key factors and/or are not applicable to the Proposal and have therefore not been subject to detailed consideration.

Table 7: Principles from the Environmental Protection Act 1986

Principle	Consideration of principle in the Proposal
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.* *In application of this precautionary principle, decisions should be guided by:* a. *careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* b. *an assessment of the risk-weighted consequences of various options.*	The proponent has addressed the precautionary principle by developing a suitable understanding of the environmental values of the site (flora, vegetation, fauna, wetlands, surface water, groundwater, surrounding land uses) such that decisions regarding the development and its design can be made without the risk of any potentially unknown environmental values being impacted. Comprehensive biological surveys and assessments have been undertaken by experienced ecologists to inform the assessment of the Proposal. This has enabled careful evaluation to avoid and minimise potential impacts as far as practicable. The design and proposed management measures have been informed by and respond to the outcomes of environmental investigations, through the adoption of impact avoidance where possible and mitigation through management. This reduces the risk of significant environmental impacts occurring.

Table 7: Principles from the Environmental Protection Act 1986 (continued)

Principle	Consideration of principle in the Proposal
2. The principle of intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.	The Proposal is located within an area designated for rural land uses and has multiple wind farms in close proximity. The DE has been subject to clearing and degradation historically, with the majority of the vegetation in degraded or completely degraded condition. Whilst implementation of the development may result in some environmental impacts, impact avoidance measures have been incorporated as part of both the design process and proposed implementation, with areas of vegetation retained and management measures for fauna proposed as part of the construction process such that residual impacts are not significant. Additionally, the wind farm is a renewable energy source and will contribute lower greenhouse gas emissions, which will benefit future generations.
3. The principle of the conservation of biological diversity and ecological integrity Conservation of biological diversity and ecological integrity should be a fundamental decision.	Based on the outcomes of the environmental investigations, the Proposal has responded to values identified within the DE and implemented changes to the design and micro-siting of the WTG, to avoid clearing of any intact native vegetation in 'good' or better condition.
4. Principles relating to improved valuation, pricing and incentive mechanisms *a. Environmental factors should be included in the valuation of assets and services.* *b. The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.* c. *The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.* d. *Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems.*	Use and disposal of goods, services and waste will be managed in accordance with existing state and local arrangements. The Proponent will be responsible for funding the cost of environmental avoidance, mitigation, and management.
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	The Proponent will take all reasonable and practical measures to minimise the generation of waste and its discharge into the environment during clearing and construction, and through the design of the Proposal. Waste will be minimised by adopting the hierarchy of waste controls: avoid, minimise, reuse, recycle and safe disposal.

4.2 Preliminary key environmental factors

A preliminary review of the EPA's factors with regard to the Proposal are detailed in **Table 8**.

Table 8: Consideration of environmental factors in relation to the Proposal

Theme	Factor	Objective	Relevance to Proposal
Sea	Benthic Communities and Habitats	To protect benthic communities and habitat so that biological diversity and ecological integrity and maintained.	**Not applicable.** The Proposal is not associated with activities that will impact on or disturb any benthic habitats.
	Coastal Processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.	**Not applicable.** The Proposal is not associated with activities that will impact on or be in the vicinity of coastal processes.
	Marine Environmental Quality	To maintain the quality of water, sediment and biota so that environmental values are protected.	**Not applicable.** The Proposal is not associated with activities that will impact on or disturb any marine environments.
	Marine Fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.	**Not applicable**. The Proposal is not associated with activities that will impact on or disturb any marine environments.
Land	Flora and Vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained	**Preliminary key factor.** No threatened or priority flora or threatened or priority ecological communities were identified within the DE based on a Detailed Flora and Vegetation Assessment (Emerge Associates 2024c). All potential indirect impacts can be mitigated through the implementation of environmental management plans during the required works associated with implementing the Proposal. There will be an impact of a maximum of 2.93 ha of native vegetation (2.89 ha in 'degraded' condition, 0.04 ha in 'good' to 'very good' condition) being cleared or materially disturbed. The environmental outcomes of the Proposal will be the clearing of 2.93 ha of native vegetation and clearing of scattered non-native vegetation on pastoral land for roads, turbines and associated infrastructure. In order to avoid flora and vegetation values. Condition 15 of the DA requires the implementation of the approved Environmental Assessment and Management Plan prepared by Emerge Associates which will manage impacts to flora and vegetation. Residual impacts to flora and vegetation are not considered to be significant.

Table 8: Consideration of environmental factors in relation to the Proposal (continued)

Theme	Factor	Objective	Relevance to Proposal
Land (continued)	Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected	**Not a key factor.** Distinctive landforms are not present within or adjacent to the Proposal based on the physical environment and therefore impacts at a landform scale are considered unlikely.
	Subterranean Fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	**Not a key factor.** The DE is unlikely to contain habitat which supports subterranean fauna such as stygofauna (aquatic animals that inhabit groundwater in caves, aquifers and water-saturated interstitial voids) and troglofauna (air breathing animals that inhabit air-filled caves and smaller voids above the water table) that would be impacted by the activities that are to be undertaken as part of the Proposal. Significant groundwater drawdown and/or dewatering is not considered likely as part of the Proposal.
	Terrestrial Environmental Quality	To maintain the quality of land and soils so that environmental values are protected	**Not a key factor.** Terrestrial Environmental Quality is associated with the land use practices causing impacts to soil quality, including erosion, salinity, acid sulfate soils (ASS), agricultural practices such as large-scale irrigation or intensive cropping, and waste structures such as those for waste rock and tailing storage facilities. The Proposal will not result in activities that will impact soil quality. There is also a low risk of Acid Sulfate Soils (ASS) recorded in the areas based on the WA risk mapping (DWER 2023b). ASS will be considered and if required managed through Condition 15 of the DA which requires implementation of the approved Environmental Assessment and Management Plan prepared by Emerge Associates.
	Terrestrial Fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained	**Preliminary key factor.** A *Basic Fauna and Targeted Bird and Bat Assessment* was undertaken by Emerge Associates (2024b) and from this the likelihood of occurrence assessment identified one threatened (Carnaby's cockatoo), two specially protected (fork-tailed swift and peregrine falcon) and four priority fauna species with a 'high' or 'moderate' likelihood of occurrence. An *Avifauna Impact Risk Assessment* (Emerge Associates 2024a) (**Appendix E**) was conducted for Carnaby's cockatoo and fork-tailed swift, which resulted in a 'low' risk of impact to either species. The primary direct impact to Carnaby's cockatoo will be clearing of 0.04 ha and the trimming of 0.19 ha of primary native foraging habitat at the Cowalla Road/Brand Highway junction to allow for the WTGs to be transported into the DE. All potential indirect impacts can be mitigated through implementation of environmental management plans during the required works. Minimal impact is expected to native vegetation habitat for fauna, and no impact to potential habitat trees with hollows. There will be a low risk to conservation significant and migratory species for bird and bat strike injury and mortality, a low risk of behavioural modifications in terrestrial fauna due to noise, and a low risk of disturbance and displacement of terrestrial fauna due to avoidance. There is a low risk of bat barotrauma. Condition 15 of the DA requires the implementation of the approved Environmental Assessment and Management Plan which specifically includes an Avifauna Monitoring Programme and will manage impacts to terrestrial fauna. Residual impacts to terrestrial fauna are not considered to be significant.

Table 8: Consideration of environmental factors in relation to the Proposal (continued)

Theme	Factor	Objective	Relevance to Proposal
Water	Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected	**Not a key factor.** No surface water or groundwater features are identified within the DE or nearby that would be detrimentally impacted by the Proposal. Groundwater abstraction will be in accordance with the RIWI Act and stormwater will be infiltrated locally and/or disposed via the local drainage network. There are no surface water features, such as wetlands (RAMSAR, Important Wetlands in Australia, geomorphic), rivers, creeks or man-made drains (or similar) mapped within or directly adjacent to the DE (DBCA 2023a), and no features were identified as part of the investigations within the DE. The nearest surface water feature is Hill River which is 5 km to the north and east of the DE. No surface water features will be impacted by the Proposal. Condition 11 of the DA requires the preparation and implementation of a Surface Water Management Plans, applicable for the construction an operational phases of the Proposal.
Air	Air Quality	To maintain air quality and minimise emissions so that environmental values are protected	**Not a key factor.** A search for the nearest air quality monitoring site (at Quinns Rocks approximately 145 km south of the Proposal) and a review of available monitoring data indicates that the air quality in the general area is considered 'good' based on the Air Quality Index (AQI) (DWER 2023a). The main impact to air quality associated with the Proposal will be the potential temporary generation of dust during clearing and construction activities but will be dependent on weather conditions. Machinery and vehicles interactions with the soil and potential generation of dust can be mitigated through the use of commonly employed dust suppression measures such as water truck dust suppression, avoiding clearing and construction during periods of high wind and utilising hydromulch if the Proposal was to remain without surface cover for any period of time. The Proposal will not pose a risk to air quality, with dust able to be managed through the DA process, and the EPA objective for this factor can be met.
	Greenhouse Gas Emissions	To minimise the risk of environmental hard associated with climate change by reducing greenhouse gas emissions as far as practicable.	**Not a key factor.** Greenhouse gas emissions from the construction and operation of the Proposal will not exceed EPA's Greenhouse Gas Emissions factor guidelines. Scope 1 emissions will be below 100,000 t CO_2-e annually and Scope 2 emissions will be below 100,000 t CO_2-e annually.

Table 8: Consideration of environmental factors in relation to the Proposal (continued)

Theme	Factor	Objective	Relevance to Proposal
People	Social Surroundings	To protect social surroundings from significant harm	**Preliminary key factor.** <u>Cultural heritage considerations</u> A review of the Aboriginal Cultural Heritage Inquiry System (ACHIS) dataset did not identify any Registered Aboriginal Heritage Sites or Other Heritage Places within the site. A review of the Australian Heritage Database, the State Heritage Office database, and the Local Heritage Survey indicated there are no state registered heritage sites located within the DE. The nearest known Aboriginal heritage site is 5 km from the DE. There is ongoing consultation with the Yued and a pre-construction heritage survey currently being completed. The Proponent has entered into a Heritage Protection Agreement (HPA) and a Relationship Agreement with Yued and the cultural heritage survey will inform the preparation and implementation of a Cultural Heritage Management Plan in collaboration with Yued. <u>Shadow flicker and blade glint</u> A *Shadow Flicker and Blade Glint Assessment* (Aurecon 2024b) concluded that there would be a low impact from blade glint and that dwellings will experience shadow flicker within the allowable limits. Excess shadow flicker can be addressed using flicker timers. <u>Noise</u> A noise impact assessment was carried out for the proposed operational wind farm at 25 identified receiver points, and noise emissions were determined to comply with the noise criteria specified in EPA of South Australia *Wind Farms – Environmental noise guidelines– July 2009 Updated November 2021*, based on the background noise monitoring. Four (4) locations are 'stakeholder' premises and the noise levels at the 'stakeholder' premises comply with the criteria recommended by the SA Guidelines for such premises. The stakeholder premises, via landowner/stakeholder agreements, will be part of the noise emitting premises pursuant to the *Environmental Protection (Noise) Regulations 1997*. A Noise Management Plan will be prepared and implemented the address Condition 10 of the DA to demonstrate that noise emissions will achieve compliance with the requirements of the in EPA of South Australia *Wind Farms – Environmental noise guidelines– July 2009, Updated November 2021*. The Proposal will need to comply with the *Environmental Protection (Noise) Regulations 1997* and the Noise Mitigation Plan will demonstrate this based on the extent of landowner/stakeholder agreements and the final layout accommodating any WTG micro-siting.

Table 8: Consideration of environmental factors in relation to the Proposal (continued)

Theme	Factor	Objective	Relevance to Proposal
People (cont.)	Social Surroundings (continued)	To protect social surroundings from significant harm	Visual amenity *A Landscape and Visual Impact Assessment* (Emerge Associates 2024e) found no significant impacts to social surroundings are likely, and any impacts can be managed through positioning of the Proposal elements. Consultation The Proponent has undertaken consultation with a range of parties, including Federal and State Government Departments, the local government, Yued, and the wider local community through a number of opportunities including open public forums. To date there have been no material issues, concerns or objections raised in relation to the Proposal or its implementation.
	Human Health	To protect human health from significant harm	**Not applicable.** No radioactive substances or emissions are associated with the Proposal.

5. Flora and Vegetation

5.1 EPA environmental factor and objective

The EPA's *Environmental Factor Guidelines for Flora and Vegetation* (EPA 2016a) states that the broad objective for Flora and Vegetation is '*To protect so that biological diversity and ecological integrity are maintained*'.

5.2 Relevant policy and guidance

At the state level, threatened flora species are listed under sections 19(1) and 26(2) of the *Biodiversity Conservation Act 2016* (BC Act), while threatened ecological communities (TECs) are listed under sections 27(1) and 33 of the BC Act. Threatened flora species and TECs are also acknowledged through other state environmental approval processes such as environmental impact assessment pursuant to Part IV of the *Environmental Protection Act 1986* (EP Act) and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

The flora and vegetation investigations that have informed the Proposal have been conducted in accordance with the *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) and the *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016a).

In Western Australia, an ecological community under consideration for listing as a TEC, but which does not yet meet survey criteria or has not been adequately defined, or which is rare but not currently threatened, is referred to as a priority ecological community (PEC). Similarly, species of flora which are potentially rare or threatened, or meet the criteria for near threatened, or have recently been removed from the threatened species list are classed as 'priority' flora species. PECs and priority flora are not protected statutorily.

At the federal level, certain listed TECs and threatened flora are protected through the EPBC Act and are identified as Matters of National Environmental Significance (MNES). Any action likely to have a significant impact on a listed TEC or threatened flora species requires approval from the Commonwealth Minister for the Environment.

5.3 Receiving environment

5.3.1 Studies and investigations

A flora and vegetation assessment for the original Badgingarra Wind Farm identified two native vegetation types ranging from 'low' to 'high' quality remnants (Brett Lane & Associates Pty Ltd 2008), with most of the site mapped as 'exotic (introduced) vegetation'. Two conservation significant (non-MNES) flora species, *Davesia epiphyllum* (Priority 3) and *Loxocarya gigas* (Priority 2), were identified in remnant native vegetation 4 km south, while no threatened (including MNES) or priority flora species were identified on-site.

Emerge Associates (2024d) conducted a *Detailed Flora and Vegetation Assessment* (**Appendix C**) to the standard required of a 'detailed' and 'targeted flora' survey in the EPA's *Technical Guidance* –

Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016b). The assessment included a desktop study of the environmental context of the DE and the likelihood of occurrence of threatened and priority flora and ecological communities. Field surveys were conducted over multiple days between September and November 2023 during which the composition and condition of vegetation was recorded. The detailed flora and vegetation assessment comprised three separate site visits in spring (18-22 September, 23-27 October and 2-3 November 2023), and included consideration of conservation significant flora such as threatened flora species and TECs listed under the EPBC Act.

5.3.2 Environmental values

Fourteen (14) plant communities (vegetation units) were identified in the *Detailed Flora and Vegetation Assessment* by Emerge Associates (2024d) ranging from 'excellent' to 'degraded-completely degraded' condition (as shown in **Figure 4** and listed in **Table 9)**. The majority of the DE comprises Predominantly non-native vegetation in 'completely degraded' condition (8,153.02 ha, 95.49%), heavily disturbed areas comprising predominantly pasture grasses and forbs and/or scattered non-native and planted trees with occasional native species including scattered *Eucalyptus todtiana*, *Eucalyptus lane-poolei* and *Eucalyptus rudis* trees. Waterways dominated by **Juncus acutus*, bare soil, roads and buildings have also been included in this category.

Table 9: Plant communities identified within the Development Envelope

Vegetation code	Description	Extent within Development Envelope (ha)
Cc	Open woodland *Corymbia calophylla* and scattered non-native trees over pasture weeds and occasional native species.	14.62
CcXpEm	Low woodland *Corymbia calophylla* (or absent) over open shrubland *Xanthorrhoea preissii*, *Banksia armata* var. *armata*, *Hakea lissocarpha*, *Gastrolobium oxylobioides* and *Hibbertia hypericoides* over rushland *Ecdeiocolea monostachya*, *Lepidosperma* sp. 5 and *Caustis dioica* over sparse grassland *Austrostipa elegantissima* over mixed native forbs and occasional pasture weeds on sandy loam soils.	4.12
EgEdGpTa	Open mallee woodland *Eucalyptus gittinsii* subsp. *illucida* and *Eucalyptus drummondii* over shrubland *Gastrolobium plicatum*, *Banksia shuttleworthiana* and *Hibbertia hypericoides* over low scattered shrubs *Tetratheca angulata* (P3) and *Scaevola* spp. over diverse native herbs on sandy soils sometimes with latertic gravel associated with lower slopes and flats.	7.44
El	Open woodland *Eucalyptus lane-poolei* over mixed native understorey vegetation encroaching from adjacent **EtBaBmBc** vegetation (or absent), bare ground and pasture weeds.	7.27

Table 9: Plant communities identified within the Development Envelope (continued)

Vegetation code	Description	Extent within Development Envelope (ha)
ElEaJcCa	Open woodland *Eucalyptus lane-poolei* and occasional *Eucalyptus accedens* over open shrubland *Jacksonia calcicola*, *Acacia pulchella* var. *glaberrima*, *Gastrolobium oxylobioides* and *Hibbertia hypericoides* over open rush/sedgeland *Mesomelaena pseudostygia*, *Caustis dioica* and *Lepidosperma* sp. 7 over low shrubland *Conostylis aculeata* var. *aculeata* on sandy soils.	6.62
EtBaBmBc	Low open woodland *Eucalyptus todtiana*, *Banksia attenuata*, *Banksia menziesii*, *Banksia candolleana* and occasional *Banksia prionotes* and/or *Hakea obliqua* over open shrubland *Apectospermum spinescens*, *Adenanthos cygnorum* subsp. *cygnorum*, *Allocasuarina humilis* and *Callitris acuminata* over low shrubland *Eremaea* spp., *Hypocalymma xanthopetalum*, *Hibbertia hypericoides*, *Stirlingia latifolia* and *Conospermum* spp. over forb/rushland *Alexgeorgea subterranea*, *Alexgeorgea nitens*, *Chordifex sinuosus*, *Chordifex microdon*, *Mesomelaena pseudostygia* and *Lomandra* spp. over mixed native herbs and occasional weeds on sandy soils/sandplains.	185.1
GsBaX	Heathland to sparse heathland *Gastrolobium spinosum*, *Banksia sphaerocarpa* var. *sphaerocarpa*, *Banksia armata* var. *armata*, *Allocasuarina humilis* and *Xanthorrhoea* sp. 1 over sparse rush/sedge/grassland *Lepidosperma* sp. 3., *Schoenus brevisetis* and *Neurachne alopecuroidea* and pasture weeds on lower laterite hills.	64.15
M	Woodland to tall shrubland *Melaleuca* spp. over pasture weeds and occasional native species.	2.11
MpEt	Woodland *Melaleuca preissiana* and *Eucalyptus todtiana* over pasture weeds and/or **Juncus acutus* and occasional native species.	4.22
Mr	Occasional *Corymbia calophylla* and *Acacia acuminata* over closed shrubland *Melaleuca radula* and occasional *Calothamnus* sp. 1, *Hibbertia hypericoides* and *Styphelia serratifolia* over sparse forbland *Dianella revoluta*, *Dichopogon capillipes*, *Haemodorum* ?*simplex* over open grassland *Themeda triandra* or **Briza maxima* on sandy loam soils.	1.83
Predominantly non-native vegetation	Heavily disturbed areas comprising predominantly pasture grasses and forbs and/or scattered non-native and planted trees with occasional native species including scattered *Eucalyptus todtiana*, *Eucalyptus lane-poolei* and *Eucalyptus rudis* trees. Waterways dominated by **Juncus acutus*, bare soil, roads and buildings have also been included in this category.	8153.05
Ps	Tall open shrubland *Petrophile shuttleworthiana* over scattered native shrubs over sparse grassland *Austrostipa* spp. and/or pasture weeds.	10.85
PsBsAhX	Closed heathland *Petrophile shuttleworthiana*, *Banksia sphaerocarpa* var. *sphaerocarpa*, *Lambertia multiflora* var. *multiflora*, *Allocasuarina humilis*, *Banksia kippistiana* var. *paenepeccata* (P3), *Hibbertia hypericoides* and *Xanthorrhoea* spp. over sparse low shrubland *Banksia stenoprion* and *Banksia nana* (P3) over open rush/sedgeland *Mesomelaena* spp., *Schoenus* spp., *Lepidosperma* spp. over diverse native forbs on laterite plateaus and rises.	52.52
X	Shrubland to open shrubland *Xanthorrhoea* spp. over scattered mixed native shrubs (or absent) over pasture weeds and occasional native species.	1.98
XBcM	Heathland *Xanthorrhoea* spp., *Banksia carlinoides*, *Lambertia multiflora* var. *multiflora*, *Banksia sphaerocarpa* var. *sphaerocarpa*, *Calothamnus longissimus* and *Melaleuca* sp. 2 over rush/sedgeland *Mesomelaena* spp., *Schoenus* spp., *Lepidosperma* spp. and *Lepidobolus quadratus* (P3) over diverse native herbs on lateritic breakaways.	13.92

5.3.3 Vegetation condition

Vegetation condition was assessed as part of the *Detailed Flora and Vegetation Assessment* (Emerge Associates 2024d). The extent of vegetation by condition category is detailed in **Table 10** and illustrated in **Figure 5**. Based on the Emerge Associates (2024d) assessment, the majority of the DE comprises predominantly non-native vegetation in 'completely degraded' condition (8153.02 ha).

Table 10: Vegetation condition identified within the Development Envelope

Condition category (Keighery 1994)	Extent within Development Envelope (ha)
Pristine	0
Excellent	168.48
Very good	91.09
Very good - Good	23.59
Good	3.71
Good - degraded	26.42
Degraded	33.09
Degraded - completely degraded	30.35
Completely degraded	8153.05

5.3.4 Threatened and priority ecological communities

The desktop search using the PMST (DCCEEW 2024) and DBCA's TEC and PEC database (reference no. 46-0923EC) identified five (5) threatened ecological communities (TECs) and four (4) priority ecological communities (PECs) occurring or potentially occurring within a 50 km radius of the DE, as detailed in **Table 11**.

All TECs and PECs identified from database searches were confirmed as having a 'nil' likelihood of occurrence within the DE from the field survey, meaning that the field survey confirmed that they do not occur within the DE.

Table 11: Conservation significant communities and likelihood of occurrence assessment

Code	Community name	TEC/PEC	Level of significance State	Level of significance EPBC Act	Likelihood of occurrence
SCP07	Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson *et al.* (1994)	TEC	EN	CR	Nil
Tuart woodlands	Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain	TEC/PEC	P3	CR	Nil
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	TEC	CR	EN	Nil
Lesueur-Coomallo A1.2	Lesueur-Coomallo floristic community A1.2 as originally described by Griffin and Hopkins (1990)	TEC	CR	-	Nil

Table 11: Conservation significant communities and likelihood of occurrence assessment (continued)

Code	Community name	TEC/PEC	Level of significance State	Level of significance EPBC Act	Likelihood of occurrence
Lesueur-Coomallow D1	Lesueur-Coomallo floristic community D1 as originally described by Griffin and Hopkins (1990)	TEC	CR	-	Nil
Lesueur-Coomallo DFGH	Lesueur-Coomallo Floristic Community DFGH	PEC	P1	-	Nil
Lesueur-Coomallo M2	Lesueur-Coomallo Floristic Community M2 (*Melaleuca preissiana* woodland)	PEC	P1	-	Nil
Gp200-170	*Petrophile chrysantha* low heath on Lesueur dissected uplands (Gp200-170)	PEC	P2	-	Nil

5.3.5 Conservation significant flora

Emerge Associates (2024d) conducted searches using the DCCEEW *Protected Matters Search Tool*, DBCA's *Threatened and Priority Flora Database* (DBCA 2017b) and *WA Herbarium Database* (DBCA 2023e) (reference no. 72-0923FL) which initially identified 41 threatened and 160 priority flora occurring or potentially occurring within a 20 km radius of the DE. The likelihood of occurrence assessment identified 13 threatened and 106 priority flora that were classified as having a 'high' or 'moderate' likelihood of occurrence within the DE.

Emerge Associates (2024d) recorded 478 native and 25 non-native flora species during field surveys. While no threatened species were identified, 23 priority flora species were recorded within intact native vegetation areas (**Table 12**).

Emerge Associates (2024d) concluded that there were 13 threatened and 84 additional priority flora species that may occur within various intact native vegetation areas within the DE.

Table 12: Priority flora species recorded within the DE

Species	Conservation status	Number of individuals recorded
Chordifex reseminans	P2	6
Hypocalymma serrulatum	P2	1
Leucopogon plumuliflorus	P2	4
Lyginia excelsa	P2	2
Synaphea xela	P2	1
Austrostipa nunaginensis	P3	2
Banksia kippistiana var. *paenepeccata*	P3	13
Banksia nana	P3	11
Beaufortia bicolor	P3	4
Drosera prophylla	P3	2
Hensmania stoniella	P3	7

Table 12: Priority flora species recorded within the DE (continued)

Species	Conservation status	Number of individuals recorded
Lepidobolus quadratus	P3	5
Phlebocarya pilosissima subsp. *pilosissima*	P3	3
Stylidium hymenocraspedum	P3	1
Stylidium nonscandens	P3	1
Tetratheca angulate	P3	3
Banksia chamaephyton	P4	2
Desmocladus elongatus	P4	3
Eucalyptus x *carnabyi*	P4	1
Hypolaena robusta	P4	2
Schoenus griffinianus	P4	1
Stylidium aeonioides	P4	3
Stylidium inversiflorum	P4	1

Note: P1-P4 = priority 1 to priority 4

5.4 Potential environmental impacts

5.4.1 Direct

Potential direct impacts on Flora and Vegetation are through clearing within the DE. Minimal native vegetation in 'good' or better condition is proposed to be cleared, and has been limited to 0.04 ha. The total DF is approximately 491.54 ha and is on heavily disturbed areas of land comprising predominantly pasture grasses and scattered non-native vegetation in 'completely degraded' condition. Areas of vegetation in 'good – degraded' or better condition may provide potentially suitable habitat for threatened flora species. Given the proponent is not intending to remove more than 0.04 ha of native vegetation in 'good' or better condition, the risk to threatened flora is considered minimal, and targeted survey has confirmed the absence of threatened flora within the DF.

5.4.2 Indirect

A potential indirect impact of the Proposal on flora and vegetation is the introduction and/or spread of declared pests and other weed species into adjacent conservation areas (i.e. Badgingarra National Park). Flora that are regarded as having negative environmental or economic impacts are often referred to as weeds (DBCA 2023f). Particularly invasive or detrimental weed species may be listed as a 'declared pest' pursuant to the State *Biosecurity and Agriculture Management Act 2007* (BAM Act) or as a 'weed of national significance' (WoNS) (DAWE 2021), indicating that it warrants special management to limit its spread. Current pest status and control categories for Western Australia are provided in the *Western Australian Organism List* (DPIRD 2022b).

One plant species listed as a declared pest pursuant to the BAM Act, **Echium plantagineum* (Paterson's curse), was recorded within the DE. The species occurs as scattered plants throughout

the predominantly non-native vegetation unit. No control category applies to this species. No weeds of national significance (WoNS) were recorded.

Another potential indirect impact on flora and vegetation resulting from development is the introduction and spread of the plant pathogen *Phytophthora cinnamomi* (dieback). Dieback affects at least 40% of native flora species within in the south-west of Western Australia, including banksias, jarrah and grass trees. It is a soil-borne pathogen that affects the root system of plants, restricting the absorption of water and nutrients, which can lead to plant death. The pathogen is spread through the movement of soil and water. There is no known cure to dieback. The 'vulnerable zone' for dieback is the geographic region in which conditions enable dieback to occur and persist. This zone includes all areas of the south-west land division west and south of the 400 mm rainfall isohyet (DBCA 2020). The Proposal lies within the northern limit of the vulnerable zone.

Altered hydrology or water quality, including changes in the groundwater level and alteration of the surface water flow, can potentially indirectly impact flora and vegetation. Stormwater collected from hardstand areas (79 wind turbine pads and access tracks) will drain from the hard stand into adjoining clear areas where it will be allowed to infiltrate. There will not be uncontrolled water loss to the surrounding environment through surface flows.

The Proposal has the potential to result in increased dust generation during construction works that may potentially adversely impact vegetation surrounding the DE. Notwithstanding, any indirect impacts are anticipated to be localized and temporary, and primarily limited to construction. It is anticipated that dust deposition on surrounding flora and vegetation will not result in significant impacts.

5.5 Mitigation

The proponent has considered a range of measures to mitigate potential impacts of the future implementation of the Proposal and to reduce the residual impacts on flora and vegetation. This includes impact avoidance, minimization, and rehabilitation consistent with the EPA mitigation hierarchy. The planning mechanisms applicable to each mitigation measure are outlined in the following sections.

5.5.1 Avoid

The Parron Wind Farm layout was refined specifically to consider the key environmental characteristics and values within the DE. The key avoidance measure for the Proposal was to avoid the need for clearing of native vegetation. Siting of WTG hardstands, ancillary infrastructure and access roads outside of areas of native vegetation been pursued and is clearly demonstrated in the Proposal layout. **Figure 4** demonstrates how the WTGs have been deliberately positioned to avoid areas with intact native vegetation. This strategic avoidance avoids habitat removal, loss and fragmentation.

The ecological survey results have informed the design and placement of turbines and project infrastructure to avoid areas of native vegetation and those that support species of local (WA) conservation significance. The Proposal takes a risk averse approach and avoids the need to remove

any intact native vegetation in 'good' or better condition, with full avoidance of direct impacts being the key strategy.

A key principle guiding development within the DE is to maximise the retention of the existing vegetation values through impact avoidance to flora and vegetation. This will be achieved through avoidance of clearing of intact native vegetation in 'good' or better condition (limited to 0.04 ha) and conservation significant species. The risk of impacts to threatened flora is considered negligible.

5.5.2 Minimise

A key principle guiding development within the DE is to maximise the retention of the existing vegetation values through avoidance of clearing of native vegetation. Mitigation measures for flora and vegetation to be implemented as part of construction within the DE include (but are not limited to):

- Positioning of the proposed wind farm layout to avoid necessity to remove native vegetation
- Micro-siting of the WTGs to avoid native species
- Utilise existing access roads
- Avoid any large (greater than 500 mm diameter at breast height (DBH)) remnant native trees where possible
- Preparation of a *Construction Environmental Management Plan* (CEMP)
- Identification of tree/vegetation retention areas on engineering drawings and delineation of tree protection zones (TPZ). These will be identified as 'no go zones' or similar and managed in accordance with arborist advice. No storage of machinery or equipment will be permitted under retained trees/vegetation.
- Where possible, as part of agricultural/non-native vegetation clearing, mulch vegetation in situ
- Implement hygiene protocols during the clearing and construction process to minimise introduction/spread of weeds and plant pathogens. This will include:
    - Vehicles, machinery, and personnel to be free of mud/soil and plant material upon entering the site. Inspections to be completed prior to works commencing.
    - Minimising clearing and earthworks during wet conditions.
    - Using landscaping species not identified as weeds.

In support of micro-siting the WTGs to avoid native species, Condition 3 in the DA states that 'The approved wind turbines may be micro-sited within a 300 m radius of the turbine locations on the endorsed development plans. Prior to the commencement of construction, amended development plans, including the final siting of wind turbine locations, shall be submitted to and approved by the Shire of Dandaragan.' Additionally, Condition 15 of the DA implements the Environmental Assessment and Management Plan prepared by Emerge Associates, which will manage potential impacts to flora and vegetation.

5.6 Assessment and significance of residual impact

The Proposal largely avoids areas of intact native vegetation in 'good' or better condition (no more than 0.04 ha impacted) and clearing will be areas of agricultural land with predominantly grasslands and non-native vegetation. The Proposal will therefore have very low residual impact.

There would be no significant residual impacts anticipated as a result of the Proposal within the DE once mitigation measures have been applied. The clearing of scattered non-native vegetation on pastoral lands does not constitute a significant residual impact and almost no intact native vegetation in 'good' or better condition is to be cleared (0.04 ha). Therefore, the residual impacts to flora and vegetation are not considered to be significant. The following considerations have informed this conclusion:

- There is no more than 0.04 ha intended clearing of intact native vegetation in 'good' or better condition within the DE.
- Any indirect impacts as a result of the Proposal can be mitigated through the implementation of environmental management plans to avoid any adverse impacts on surrounding vegetation in the broader locality. Condition 15 of the DA stipulates that 'The applicant is to implement to the satisfaction of the Shire of Dandaragan the approved Environmental Assessment and Management Plan prepared by Emerge Associates and dated October 2024 for the life of approved development.'
- No direct or indirect impacts to conservation reserves will occur. The clearing of non-native vegetation within the DE will not result in additional fragmentation of surrounding remnant vegetation patches. Linkages to much bigger patches of vegetation will remain.

5.7 Environmental outcomes

The EPA objective for flora and vegetation is '*to protect flora and vegetation so that biological diversity and ecological integrity are maintained'.*

The Proposal can be implemented in a manner which achieves the EPA objective. The identified residual impacts are not considered to be significant. All potential indirect impacts can be mitigated through the implementation of environmental management plans during the required works of the Proposal. The outcomes of the Proposal are predicted to be:

- No more than 0.04 ha impact to intact native vegetation in 'good' or better condition
- No impact to TECs or PECs
- No impact to threatened flora
- Permanent clearing of scattered non-native vegetation on pastoral land for roads, turbines and associated infrastructure
- No clearing of any pre-European vegetation associations that have <30% remaining
- No detrimental impacts to adjacent vegetation through the implementation of the Environmental Assessment and Management Plan (as per Condition 15 of the DA) with associated hygiene protocols.

6. Terrestrial Fauna

6.1 EPA environmental factor and objective

The EPA's *Environmental Factor Guideline: Terrestrial Fauna* (EPA 2016a) states that the broad objective for terrestrial fauna is: '*to protect terrestrial fauna so that biological diversity and ecological integrity are maintained*'.

6.2 Relevant policy and guidance

The fauna investigations that have informed the Proposal have been conducted in accordance with the *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020b) and the *Environmental Factor Guideline: Terrestrial Fauna* (EPA 2016a).

In addition, other guidance material that has been referenced includes:

- *Referral guideline for 3 WA threatened black cockatoo species* (DCCEEW 2022b).
- *Carnaby's cockatoo (Calyptorhynchus latirostris) Recovery Plan* (DPaW 2013a)

Specifically regarding black cockatoos, the EPBC Act *Referral guidelines for 3 WA threatened black cockatoo species* (DAWE 2022), recommends referral to the Minister for:

- loss of high-quality native foraging habitat greater than 1 ha
- loss of low-quality native foraging habitat of greater than 10 ha
- loss of exotic foraging habitat greater than 1 ha
- any loss of habitat trees
- any loss of a known roosting site.

6.3 Receiving environment

6.3.1 Studies and investigations

Fauna investigations were undertaken for the Badgingarra wind farm in 2007 (Brett Lane & Associates Pty Ltd 2008), which found that the site comprised mostly of cleared pasture land with little to no value to fauna as well as some planted eucalyptus, heathland and woodland habitats which supported a variety of native wildlife. Carnaby's cockatoo was recorded during the survey in all habitats but showed preference for heathland areas. No threatened species of mammals, reptiles or frogs were recorded within the site, and all bats found were common and widespread species.

Emerge Associates (2024a) conducted a *Basic Fauna and Targeted Bird and Bat Assessment* (**Appendix D**) from September 18 to 22, 2023, in accordance with the EPA's *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2020a) as well as a 'targeted' bird and volant mammal (bat) assessment. Opportunistic fauna sightings were recorded during the field survey and habitat suitability was evaluated for threatened, specially protected, and priority fauna species. A targeted bird and bat survey was conducted to assess the susceptibility of these groups to wind farm operational impacts.

An *Avifauna Impact Risk Assessment* (AIRA) Emerge Associates (2024a) (**Appendix E**) was undertaken to consider the risk of potential impacts to two MNES species highlighted in previous fauna survey from the DE as potentially occurring:

- *Zanda latirostris* – Carnaby's cockatoo (endangered under the EPBC Act) and;
- *Apus pacificus* – Pacific swift/fork-tailed swift (migratory under the EPBC Act)

6.3.2 Environmental values

The *Basic Fauna and Targeted Bird and Bat Assessment* (Emerge Associates 2024b) identified ten (10) broad fauna habitats within the DE, as listed in **Table 13** and shown in **Figure 6**.

Table 13: Fauna habitats identified within the Development Envelope

Fauna habitat	Description	Total area (ha)	Proportion of DE (%)
Agricultural vegetation	Planted **Chamaecytisus palmensis*. Value of habitat varies across the DE with some locations densely vegetated, others planted more recently in rows and with an open structure and some locations intermixed with broken woody debris and dead vegetation. • Value to fauna varies dependent on vegetation cover and structure. • Low microhabitat complexity. • Areas with more dense vegetation may provide habitat for larger mammals as well as common and widespread avifauna.	738.07	8.65
Bare ground and pasture	Mostly cleared or low non-native (weed) grassland paddocks used for sheep grazing. Includes farm laneways, firebreaks and cleared areas around infrastructure (houses, sheds etc.). • Provides little to no value for most fauna. • Low microhabitat complexity. • May be utilised by raptor species hunting for lambs, mice and rats in the paddocks. • Used by livestock. • Some avifauna may traverse across this habitat to move to more intact native vegetation.	7246.97	84.97
Dams	Permanent or semi-permanent water features. Mostly agricultural dams built adjacent to wetland areas to service livestock. • Most likely used by widespread and common avifauna, amphibia and introduced mammals and livestock. • Higher quantity of invertebrate species including *Cherax destructor*.	2.31	0.03
Eucalypt woodland	Dense woodland of native *Eucalyptus* spp. trees over mixed native shrub and understory species. • Moderate microhabitat complexity (woody debris, burrows, runnels, fallen logs, leaf litter). • Canopy and dense shrub layer likely supports an array of common and rarer avifauna. • Denser understory areas combined with soft soils are likely to support ground dwelling fauna and reptiles. • Connectivity with intact roadside vegetation outside of the DE.	19.58	0.23

Table 13: Fauna habitats identified within the Development Envelope (continued)

Fauna habitat	Description	Total area (ha)	Proportion of DE (%)
Laterite hills and breakaways	Native shrubland vegetation on laterite breakaways and hills. Includes some smaller hills in paddocks which are mostly grazed and have lower cover of shrubs. • Moderate microhabitat complexity for most areas (details). • Low microhabitat complexity in smaller hills in paddocks. • Provides habitat for smaller shrub-dwelling birds and some raptor species as well as small reptiles. Larger mammals may traverse through these sites. • Used by livestock.	71.76	0.85
Open forest	Open Eucalyptus spp. forest of mostly non-native, planted trees interspersed with some native species. Heavy disturbance from vehicle tracks and grazing. • Low microhabitat complexity. Some fallen woody debris and sandy patches with reptile burrows. • Utilised by common and widespread avifauna and livestock.	120.68	1.41
Plateau	Native shrubland located on a rocky laterite plateau. • High microhabitat complexity (woody debris, rocky outcroppings, small caves, dense shrubs, burrows). • Likely utilised by a broad fauna assemblage including most avifauna not requiring canopy, mammals and reptiles. • Fenced with few livestock incursions. • Connectivity with sandplain woodland habitat as well as high value vegetation outside the DE.	58.75	0.69
Riparian and wetland vegetation	Riparian vegetation surrounding water features or growing in seasonally inundated drainage lines. • Moderate microhabitat complexity. Some woody debris, dense understory vegetation, water features (puddles, drainage line, muddy terrain). • Species are likely to move between this habitat and dams and water features. • Used mostly by widespread and common avifauna, amphibia and likely introduced mammals and livestock. Where not fenced, areas are frequented by livestock for shade.	22.89	0.27
Sandplain	Open *Eucalyptus* spp. and *Proteaceae* woodland over native shrubs on sandy soil • High microhabitat complexity (woody debris, burrows, runnels, fallen logs, leaf litter) • Denser areas may provide habitat for larger mammals and a wide assemblage of common and rarer avifauna as well as reptiles. • Largest areas of habitat fenced from livestock.	191.81	2.25
Scattered trees and shrubs	Scattered native and non-native trees and shrubs over non-native grasses. Mostly associated with *Eucalyptus gomphocephala* in paddocks or along firebreak/laneway edges and remnant **Chamaecytisus palmensis* in paddocks. • Low microhabitat complexity. • Utilised mostly by livestock -shade. Some common avifauna may use sparingly. • Poor connectivity with surrounding areas of vegetation. • Some *Pinus spp.* on the western edge of the DE provide primary food resources for Carnaby's cockatoo.	55.73	0.65

An initial search was conducted for fauna species that have been recorded within a 20 km radius of the DE using the *Protected Matters Search Tool* (DCCEEW 2023b), *NatureMap* (DBCA 2023d), DBCA's conservation significant fauna database (reference no. FAUNA7936), Atlas of Living Australia (ALA 2023) and literature references. A total of 932 fauna species were identified from database searches as occurring or potentially occurring within 50 km of the DE (Emerge Associates 2024b).

The field survey recorded a total of 58 native and eight introduced fauna species directly or indirectly (from foraging evidence). The 58 native fauna species recorded during the survey are mostly common in the region and were typically observed in areas of more intact vegetation with higher connectivity to nearby vegetation.

Emerge Associates (2024b) identified three bat taxa from three sample locations within the DE. The number of each species is shown in **Table 14**.

Table 14: Bat species and relative abundance

Species		Site and relative abundance			
Scientific name	Common name	A	B	C	D
Chalinolobus gouldii	Gould's wattled bat	22	1	-	132
*Nyctophilus spp.^*	Long-eared bats	22	4	-	-
Vespadelus regulus	Southern forest bat	9	10	-	5

^The *Nyctophilus* spp. calls were unable to be separated to species level but regional restrictions on the genus suggest it is likely *Nyctophilus geoffroyi*, lesser long-eared bat.

The three species of microbat recorded at the DE are common and widespread across several regions in Australia. All species prefer roosting in old tree hollows and occasionally utilise cliff overhangs. The open forest, plateau, laterite hills and breakaways, sandplain, eucalyptus woodland habitats in the DE contain potential roosting spots for bat species and intact vegetation that supports an array of insect prey for them to feed on. A significant proportion of ridge and breakaway overhangs that may provide suitable roosting habitat contained feral honeybee hives, limiting their usability for bats.

Emerge Associates (2024b) undertook bird utilization surveys using six fixed-point samples. Survey locations were selected based on areas where WTGs were most likely to be situated and high elevation areas. Locations aligned with the pre-development bird surveys for the Badgingarra wind farm (Brett Lane & Associates Pty Ltd 2008). Each bird species recorded was classified into one of the following three broad height categories according to the height at which the species was frequently observed:

- Height Category 1 (HC1) – Predominantly observed flying above canopy height.
- Height Category 2 (HC2) – Predominantly observed flying at canopy height.
- Height Category 3 (HC3) – Predominantly observed flying below canopy (in shrubs or crop/grasses)

A total of 32 bird species were observed across the six sample sites. An additional 19 species were observed within the DE but outside of the fixed-point bird survey sites. Eleven (11) species were observed from HC1, 12 species in HC2 and 29 species in HC3. A summary count of the bird species observed across all fixed-point sites as well as all recorded opportunistic observations are provided within Emerge Associates (2024b).

The DE has little suitable habitat for most bird species due to largely comprising pastureland and planted agricultural vegetation. Habitat at each sample location was similar, being predominantly pasture adjacent to patches of native vegetation.

Emerge Associates (2024b) observed the highest value to birds in the patches of native vegetation in the south-east of the DE with a mixture of native bird species also recorded in the patches of planted tuart stands scattered throughout the DE. A much lower diversity of species and abundance of individuals was observed in the pasture area associated with each survey location.

The small number of species and individuals observed in HC1 was attributed to the five raptor species found across the DE. Pastureland, particularly those with annual lambing seasons provide regular, reliable feeding sources for raptors, and so the presence of five common raptors was not unexpected. The rest of the birds found throughout the DE are common and widespread across the region and restricted to pasture/grasses and the high-quality fenced habitats.

Three species listed as a declared pest (C3) pursuant to the BAM Act, *Oryctolagus cuniculus* (rabbit) and *Vulpes vulpes* (fox) and *Sus scrofa* (pig), were identified from scats and diggings within the DE. The three declared pests are widespread in farming regions of WA and therefore not unexpected.

6.3.3 Conservation significant fauna

The distribution and habitat preferences of the 932 fauna species identified from database searches were reviewed in relation to the DE context information (Emerge Associates 2024b). The likelihood of occurrence of threatened, specially protected and priority species was classified as 'high', 'moderate', 'low', 'negligible' or 'nil'.

A likelihood of occurrence summary of all the conservation significant fauna species with a potential to occur within the DE is provided in **Appendix F**. Based on the outcomes of the likelihood of occurrence assessment, one threatened, two specially protected and four priority species were classified as having a 'high' or 'moderate' likelihood of occurrence. A summary of these conservation significant fauna species with a potential to occur at the DE is provided in **Table 15**. The remainder of the conservation significant fauna species identified in the desktop assessment (32 species) were considered as having a 'low', 'negligible' or 'nil' likelihood of occurrence.

Table 15: Conservation significant fauna species found to occur or are likely to occur within the DE

Species name	Common name	Status		Habitat description	Likelihood of occurrence
		WA	EPBC Act		
Birds					
Apus pacificus	Fork-tailed swift	MI	MI	Aerial, migratory species that is most often seen over inland plains and sometimes above open areas, foothills or in coastal areas. Sometimes occurs over settled areas, including towns, urban areas and cities	Moderate
Falco peregrinus	Peregrine falcon	OS	-	Mainly found around cliffs along coasts, rivers, ranges and around wooded watercourses and lakes	Moderate
Zanda latirostris	Carnaby's cockatoo	EN	EN	Mainly proteaceous scrubs and heaths and adjacent eucalypt woodlands and forests; also plantations of *Pinus* spp. Attracted to seeding *Banksia* spp., *Dryandra* spp., *Hakea* spp., *Eucalyptus* spp., *Corymbia calophylla*, *Grevillea* spp., and *Allocasuarina* spp.	High

Table 15: Conservation significant fauna species found to occur or are likely to occur within the DE (continued)

Species name	Common name	Status		Habitat description	Likelihood of occurrence
		WA	EPBC Act		
Invertebrates					
Hylaeus globuliferus	Woollybush bee	P3	-	Males are territorial and may be found perched on the growing tips of *Adenanthos* sp., *Banksia* sp. or *Jacksonia* sp. Has also been recorded visiting the flowers of *Grevillea* sp.	Moderate
Idiosoma gardneri	Mt Lesueur shield-backed trapdoor spider	P2	-	Only one recorded specimen. Found in Lesueur National Park, likely has similar biology to *Idiosoma sigillatum*.	Moderate
Mammals					
Notamacropus irma	Western brush wallaby	P4	-	Dry sclerophyll forest, *Banksia* spp. woodlands and shrublands, typically favouring dense low vegetation that provides dense cover.	Moderate
Reptiles					
Neelaps calonotos	Black-striped snake	P3	-	Coastal and near-coastal dunes, sandplains supporting heathlands and *Banksia* spp. woodlands.	Moderate

Evidence of Carnaby's cockatoo (threatened species) was recorded within the DE and this species is discussed in **Section 6.3.4**.

Two specially protected and four priority fauna species were considered to have a moderate likelihood of occurring in the DE, as described below.

- The fork-tailed swift (MI) and peregrine falcon (OS) are highly mobile species that may opportunistically fly over or forage in the DE for short periods of time as part of a much larger home range but are unlikely to perch. Neither of these species would breed within the DE. Any occurrence of fork-tailed swift or peregrine falcon in the DE would likely be in the air space and largely independent from terrestrial habitat.
- The woollybush bee (P3) is a territorial native bee species which has two records approximately 14 km west of the DE. The species has been recorded on *Adenanthos* sp., *Banksia* sp., *Jacksonia* sp. and *Grevillea* sp. These plant species were recorded in the DE during the flora assessment (Emerge Associates 2024d) and therefore the woollybush bee may occur in the sandplain and plateau habitats.
- Mt Lesueur shield-backed trapdoor spider (P2) is only known from one specimen in Lesueur National Park approximately 20 km north west of the DE and is categorized as a data deficient species (Rix *et al.* 2018). Therefore, it is not possible to assess whether the species would occur in the DE due to lack of information on its ecology or record distribution. However, given trap door spiders of the *Idiosoma* genus are known to occur in banksia woodland and heathland soils, the sandplain habitat in the DE may represent suitable habitat for the species.
- Records of the western brush wallaby (P4) occur within 20 km of the DE and the species occupies dry sclerophyll forests, banksia woodlands and heath or shrubland vegetation

(Christensen and Strahan 1984). The sandplain, plateau and fenced areas of the laterite hills and breakaways habitats represent suitable habitat for the species within the DE and have some connectivity to surrounding vegetation of similar type and quality. The species may therefore be present, although only in the eastern or southern areas of the DE with more intact native vegetation.

- Several records exist for the black-striped snake (P4) approximately 20 km south of the DE in Wongonderrah Nature Reserve. The species is known to occur in sandplains and heathland vegetation. The sandplain, plateau and fenced laterite hills and breakaways habitats in the DE may provide suitable habitat for this species.

6.3.4 Black cockatoos

Foraging evidence of Carnaby's cockatoo, including chewed plant fruits/seeds, was observed in the sandplain habitat in the south of the DE during the Emerge Associates (2024b) survey, with historic records of the species occurring in surrounding areas (DBCA 2023e). The DE is located within the northern part of the Carnaby's cockatoo modelled distribution and breeding range which spans to Eneabba, approximately 40 km north of the DE (DoEE 2016).

The DE is located outside of the modelled distribution range of Baudin's cockatoo and forest red-tailed cockatoo (DoEE 2016) and so these species are not considered likely to occur and have not been discussed further.

6.3.4.1. Breeding and roosting

Emerge Associates (2024b) recorded 185.86 ha of potential breeding habitat for Carnaby's cockatoos within the DE, primarily consisting of tuart, jarrah, marri, flooded gum and stag (dead) trees. Additionally, 185.86 ha of potential roosting habitat was identified within the DE. No roosts or evidence of roosting were observed within the DE during the field survey.

Approximately 2% of the DE contains trees potentially suitable for breeding and roosting by Carnaby's cockatoo as shown in **Figure 7**. Breeding habitat includes eucalypts with a diameter at breast height (DBH) of ≥50 cm, and roosting habitat includes eucalypts over 10 m high. Individual trees and suitable breeding hollows were not mapped or assessed, but all potential breeding habitat was identified across the DE. There is no known breeding habitat within the DE (Emerge Associates 2024b).

6.3.4.2. Foraging

A total of 468.73 ha of foraging habitat for Carnaby's cockatoo was recorded within the DE, categorized as 277.30 ha primary native, 6.37 ha primary non-native, 47.55 ha secondary native, and 137.51 ha secondary non-native habitat. The extent of foraging habitat by value category is detailed in **Table 16** and shown in **Figure 7**. The highest value foraging habitat is the primary native habitat in the eastern portion of the DE, near Badgingarra National Park (DBCA 2023e), which offers extensive habitat for the species, while scattered lower value habitats and non-foraging vegetation are also present throughout the DE, with isolated pine and marri trees likely used as foraging resources as the cockatoos move through the region.

Breeding success is associated with the availability of foraging resources within 12 km of nest sites (Saunders 1977; Glossop *et al.* 2011). The breeding sites to the north and north-east of the DE include the Coomallo 'important bird area' for Carnaby's cockatoo (DPaW 2013b; BirdLife International 2022). The 12 km buffer applied to each breeding site would provide the main foraging resources to support breeding, which does not extend into the DE (see **Figure 8**).

Table 16: Foraging habitat recorded within the DE

Foraging habitat	Foraging habitat for Carnaby's cockatoos (ha)
Primary native	277.30
Primary non-native	6.37
Secondary native	47.55
Secondary non-native	137.51
Total	**468.73**

6.4 Potential environmental impacts

6.4.1 Direct

Direct impacts during the 24-month construction period include:

- Vehicle movements on access tracks potentially causing fauna strikes
- Risk of death or injury of fauna during ground disturbance works
- Generation of dust which may impact fauna habitat
- Behavioural modifications due to noise associated with construction
- Fauna entrapment in trenches during construction
- Removal of terrestrial fauna habitat.

Direct impacts during the operational phase include:

- Risk of injury or mortality due to collision with turbines
- Behavioural modifications in terrestrial fauna due to noise associated with WTGs.

The primary direct impacts identified for conservation significant fauna in the DE, including fork-tailed swift, peregrine falcon, and Carnaby's cockatoo, are habitat loss and a risk of collision with turbine blades.

Fork-tailed swift are typically sighted in singletons or flocks of three (Marchant and Higgins 1990). There is no population estimate for the species, however flocks of up to 90,000 individuals have been recorded in Australia. Therefore, global populations are likely to be much higher than this. Additionally, they have a wide distribution across several continents, nowhere in which they are threatened (DCCEEW 2023c). Impacts to singletons or small groups is unlikely to have any effect on the population.

The risk of direct impacts to fork-tailed swift was deemed to be low. Fork-tailed swift is rarely recorded in the region, have a widespread, global distribution and have non-specific habitat requirements. They are highly unlikely to frequent the Project Area and would do so in small groups.

While they fly at Rotor Swept Area (RSA) height, the frequency in which they would fly in the DE outweighs any chance of mortality.

The peregrine falcon, similar to the fork-tailed swift, is a highly mobile species that may opportunistically fly over or forage in the site for short periods of time as part of a much larger home range but are unlikely to perch. Neither the fork-tailed swift nor the peregrine falcon would breed within the DE. Any occurrence of fork-tailed swift or peregrine falcon in the DE would likely be in the air space and largely independent from terrestrial habitat.

The DE contains potential breeding, foraging and potential roosting habitat for Carnaby's cockatoo. Based on the Proposal and the DF, there would be no impact to/loss of potential breeding habitat within the DE. Further to this, there is no known breeding activity within the DE, and the nearest known breeding sites are more than 12 km from the DE. Based on the Proposal and the DF, there would be no impact to/loss of potential roosting habitat within the DE. Further to this, there are no known roosting sites within the DE, and the nearest known roosting site is approximately 4.5 km from the DE.

Based on the Proposal and the DF, there would be minimal permanent impact to/loss of primary native foraging habitat within the DE associated with the proposed construction works associated with the Proposal. There would be clearing of 0.04 ha and some trimming of primary native foraging habitat (0.19 ha) within the DE associated with the Cowalla Road/Brand Highway intersection works to allow the transportation of WTGs to the DE. This would require the trimming of any large woody vegetation taller than 3.5m, but this is not likely to remove any foraging habitat given the characteristics of the vegetation in this area (generally less than 3.5m in height and lacking taller woody vegetation) and the trimming being temporary modification to the foraging habitat. Therefore, there is not expected to be any permanent loss of any foraging habitat within the DE. In addition, and based on this, there would not be any impact on/loss of foraging habitat within 12 km of a known breeding site or a known roosting site.

There are large areas of known Carnaby's cockatoo foraging habitat surrounding the DE associated with established conservation reserves that also support known roosting and breeding sites, and what would also be potential breeding and roosting habitat. These areas are expected to support Carnaby's cockatoo activity and movements in the wider regional context, as shown in **Figure 8**.

In contrast to the wider regional habitat context for Carnaby's cockatoo, the DE supports limited areas of potential breeding, foraging and potential roosting habitat for Carnaby's cockatoo. The larger areas of potential breeding, foraging and potential roosting habitat for Carnaby's cockatoo that do occur within the DE occur at the periphery of the DE. Notwithstanding this, there may be some movements of Carnaby's cockatoo through the DE once the proposed wind farm is operational.

Turbine collision is dependent on the ability of a species to detect a turbine as well as its ability to avoid it. Some research suggests faster speeds will be detected more often than slower speeds for avian species (Blary *et al.* 2023). Furthermore, flight behaviours which are likely to distract the species like foraging, courting or searching for habitat is more likely to result in impact (Balmori-de la Puente and Balmori 2023). With the combination of high-speed turbine rotation and any Carnaby's cockatoo likely traversing the DE in movement behaviour rather than distraction behaviours, detection ability of turbines is likely high. This is reinforced by the lack of Carnaby's cockatoo

carcasses found during mortality surveys at Badgingarra Wind Farm in first-year post-construction monitoring (Ecoscape 2019). There are no known existing examples/issues of Carnaby's cockatoo colliding with WTGs in Western Australia. Further to this, maximising the separation between ground and the lowest extent of the RSA (proposed to be 69.65m) further reduces collision impact risk, as anecdotal evidence suggests that Carnaby's cockatoo generally fly at heights up to 50m from the ground.

Overall, the only potential direct impacts on Carnaby's cockatoo from the Proposal are from WTG collisions involving individual birds. Due to the limited habitat values present in the Project Area compared to surrounding areas of habitat within the region, and the behavioural attributes of the species leaning towards low flight heights and slow movements, the likelihood of the species coming into contact with a WTG and colliding are low. The chances of direct collision with WTG are therefore non-zero but expected to be very small and not significant over the course of the operational lifespan of the wind farm.

6.4.2 Indirect

Potential indirect impacts to terrestrial fauna as a consequence of the Proposal include:

- Disturbance of fauna from construction vehicles, construction noise, vibration and lighting.
- Displacement, including disturbance to birds' movement patterns resulting in avoidance of habitats and disrupting links between feeding, roosting and/or nesting areas, or diverting flights, including migratory flights, around a wind farm.
- Increases in feral species activity as a result of increased bird and bat injury during operations.

During operation, a potential indirect impact identified for conservation-significant fauna within the DE is avoidance behaviour, which may affect species such as the fork-tailed swift, peregrine falcon, and Carnaby's cockatoo.

There is no evidence to describe avoidance behaviour with regards to the presence of WTG. However, the fork-tailed swift lacks specific habitat requirements and mostly forages in a wide distribution across a broad range of habitats. The DE is therefore lacking any specific habitat features which may draw the species. The same case can be made for the surrounding region. Therefore, if the species was to show avoidance behaviour around turbine areas, it would represent no change to its the distribution, abundance or density.

The risk of indirect impacts to fork-tailed swift was deemed to be low. Given the species widespread distribution and habitat being largely independent from terrestrial vegetation aside from insectivorous prey abundance, the DE presents no more desirable habitat values than any other patch of land across the region. Given their propensity for short-lived and often incidental sightings as well as their migratory nature, the species is likely to be completely unencumbered by the establishment of WTG across the DE.

Carnaby's cockatoo have been shown to potentially exhibit avoidance behaviour around areas with WTG in previous monitoring at Badgingarra Wind Farm. However, these results are over one year of monitoring and may also be attributed to seasonal variation in population movements. Conservatively, there may be some changes to flock movements from WTG in which individuals show avoidance of areas close to WTG. Even with complete avoidance of the DE, substantial ecological

corridors exist to the west and east of the DE which would allow regional north-south and east-west movement with access to potential and actual breeding habitat, foraging habitat, and known roosting sites and potential roosting habitat.

The overall value of the DE to Carnaby's cockatoo in a regional context is low. The majority of the DE has been cleared historically for pasture and the remnant vegetation remaining is present in small, disconnected patches. The highest Carnaby's cockatoo habitat values are in the southern and eastern portions of the DE and are continuous with areas of similar vegetation that extend outside the DE which will remain connected with no proposed WTG separating these areas. Individuals that use roosts within 6 km have access to larger, more intact and therefore more desirable areas of foraging resources nearby, and there are no larger areas foraging habitat patches within the DE that are within 6 km from known roost sites. The evidence of individuals utilising the DE is small in comparison to records in the surrounding region.

The breeding sites to the north and northeast of this location are part of the Coomallo Important Bird Area, designated for Carnaby's cockatoo (DPaW 2013b; BirdLife International 2022). Each breeding site is surrounded by a 12 km buffer zone (see **Figure 8**), which is expected to be the primary focus for foraging resources during the breeding season, though this extent would not extend into the DE. During the non-breeding season, Carnaby's cockatoo typically form larger flocks for migration and foraging.

Roosting sites consist of stands of tall trees where the black cockatoos gather overnight. Their use of these sites depends on the availability of local food, water, and regional flock movement patterns. Carnaby's cockatoo generally forage within 6 km of a roost (Le Roux 2017; DAWE 2022). While no roosts have been identified within the site, several are located nearby, with the closest being 4.5 km from the area.

6.5 Mitigation

6.5.1 Avoid

The key avoidance strategy is to avoid clearing any intact native vegetation in 'good' or better condition and Carnaby's cockatoo habitat through micro-siting of turbines and project infrastructure. Any large, planted trees with a greater than 500 mm DBH will not be removed. Given there will be minimal permanent impact to/loss of primary native foraging habitat within the DE (0.04 ha), the Proposal is not expected to impact on habitat for any protected species.

Placement of turbines will be avoided where high risk areas are identified. This is to be based on landscape position (e.g. between or adjacent to wetland areas), presence of bird and bat species, and bird behaviour and biology.

The physical presence of transmission lines can have an effect on fauna, including long-term changes in habitat, bird strikes, access issues, noise effects and associated avoidance behaviour and electric and magnetic fields. Transmission cabling to connect into the existing transmission line present on site will be underground, hence avoiding impacts to terrestrial fauna.

6.5.2 Minimise

Impacts to native fauna will be minimal given the long-term retention of the remnant native vegetation within the DE, particularly the potential black cockatoo habitat trees. However, impacts to fauna are possible as part of the construction activities, and will be minimised as follows:

- Preparation of a *Construction Environmental Management Plan* (CEMP).
- Implementation of hygiene protocols during the clearing and construction process to minimise introduction/spread of weeds and plant pathogens. This will include:
  - Vehicles, machinery, and personnel to be free of mud/soil and plant material upon entering the site. Inspections to be completed prior to works commencing.
  - Minimising clearing and earthworks during wet conditions.
  - Using landscaping species not identified as weeds.
- Curtailment protocols to be considered if required i.e. turning off wind turbines when wind levels are low and are at speeds that are less profitable or at particular periods of high risk (e.g. dawn and dusk).
- Consider turbine design, including colour selection and marking, to reduce collision risk.
- A *Fauna Management Plan* including pre-clearing fauna inspection, fauna trapping and translocation, fauna spotter and maintenance of clean site to deter feral and pest species
- Wind farm service vehicle speeds to be kept low, to avoid road kills of native fauna.
- Design and implementation of an *Avifauna Monitoring Programme*, documenting baseline use of the DE by migratory and other avifauna, and any regular local movement patterns that may be identified, with equivalent monitoring and collection of avifauna and bat mortality data post-commissioning of the turbines.

The ecological survey results have informed the current design and placement of turbines / project infrastructure to intentionally avoid high risk areas for birds and bats, and to deliberately avoid areas of intact native vegetation in ‘good’ or better condition and those that support species of conservation significance. The proponent has been very intentional about avoiding areas of native vegetation and sensitive habitat to avoid the Proposal resulting in significant impact to terrestrial fauna. Significant residual impacts are therefore considered unlikely, and it is considered that the EPA objective for this factor can be met.

Condition 15 of the DA states that ‘The applicant is to implement to the satisfaction of the Shire of Dandaragan the approved Environmental Assessment and Management Plan prepared by Emerge Associates and dated October 2024 for the life of approved development’ which specifically includes the Avifauna Monitoring Programme and will manage impacts to terrestrial fauna.

6.6 Assessment and significance of residual impact

6.6.1 Direct impacts

The key conservation significant species that have been identified as having a ‘high’ or ‘moderate’ likelihood to occur within the DE include the peregrine falcon (other specially protected species), the fork-tailed swift (migratory species), and the Carnaby’s cockatoo (threatened species).

Species using updrafts and thermals to gain height (including raptors and other birds of prey such as the peregrine falcon) are most at risk of turbine strikes, as well as those species that fly at turbine height to visit foraging habitat. Injury and mortality of birds due to strikes from the wind turbine blades and barotrauma is potentially a residual impact.

Given the ubiquity of fork-tailed swift in terms of distribution country-wide and globally, and in non-specific habitat preference, it is assumed that they will occur in the DE at some point during the operating duration of the wind farm. However, given the sparse records and known ecology, it is likely any occurrence will be temporary, independent of habitat and short in duration, at any time between October to April. The DE does not occur near any significant wetlands or breeding areas for migratory birds. While fork-tailed swift fly at RSA height, the frequency in which they would fly in the DE heavily outweighs any chance of mortality. The consequence of risks to fork-tailed swift are understood here to be broadly insignificant. Any potential loss of individuals from direct turbine collision is likely to be a small number (Emerge Associates 2024a).

The DE contains 471.08 ha of foraging habitat for Carnaby's cockatoo. In the context of the total area of the DE, 8,527 ha, this represents 5.52% of the DE. There are extensive areas of foraging habitat in nearby Badgingarra National Park, Coomallo Nature Reserve, Hill River Nature Reserve, Lesueur National Park and other remnant, non-protected tracts of bushland in the direct and wider region (20 km radius). The DE is therefore unlikely to attract Carnaby's cockatoo as a regional foraging hub in comparison to areas surrounding the DE. Additionally, the highest value foraging resources are associated large patches of *Banksia* spp. dominated woodland/heathland in the south and south-east of the DE which have high connectivity with Badgingarra National Park (Emerge Associates 2023).

Emerge Associates (2024a) *Avifauna Impact Risk Assessment* (**Appendix E**) found that habitat in the DE is of low desirability in comparison to Coomallo Nature Reserve and Badgingarra National Park. Whilst the species therefore is likely flying over the DE on occasion, most of the regional population is concentrated in areas of higher quality, larger, contiguous foraging vegetation nearby to water sources (Saunders 1980). The overall risk of direct strikes for Carnaby's cockatoo was found to be low, based on an RSA of 70 m – 230 m above ground level and the Carnaby's cockatoo flight height between 20 m and 150 m (infrequently). All flock movements recorded in adjacent Badgingarra Wind Farm were below 20 m (Ecoscape 2019).

Emerge Associates (2024a) found the direct risk to Carnaby's cockatoo and fork-tailed swift to be low. The Proposal is unlikely to have significant residual impact on conservation significant bird species including the Carnaby's cockatoo, the fork-tailed swift and the peregrine falcon. Additionally, the *Basic Fauna and Targeted Bird and Bat Assessment* (Emerge Associates 2024b) identified no conservation significant species of bat at the DE. The Proposal is unlikely to have a significant residual impact on bats.

6.6.2 Indirect impacts

There are similarities between the Proposal wind farm and Warradarge Wind Farm, which has been operating since October 2020, both being situated in rural farmland. Based on the Warradarge Wind Farm, the most relevant indirect impact to birds and bats is the removal of habitat. The Proposal avoids all intact native vegetation in 'good' or better condition, locations of potential tree hollows, and areas of 'very good' condition vegetation as identified by Emerge Associates (2024c), reducing

the impact on fauna habitat. Therefore, as no native habitat will be removed for the Proposal, there is unlikely to be a significant impact to birds and bats.

The value of the DE to Carnaby's cockatoos is low. The majority of the habitat has been cleared historically for pasture and the remnant vegetation is present in small, disconnected patches. The highest habitat values are in the south and east portions of the DE and are continuous with areas of vegetation outside the DE which will remain connected with no turbines separating the areas. Individuals that use roosts within 12 km have access to larger, more intact and therefore more desirable areas of foraging resources nearby. The evidence of individuals utilising the DE is small in comparison to records in the surrounding region.

Behavioural information pertaining to flock movements and flight heights are scarce for Carnaby's cockatoo, relying mostly on survey work and regional context. Previous wind farm monitoring in the Badgingarra region have determined that Carnaby's cockatoo typically fly at below RSA height, particularly when wind turbines are placed on elevated areas (RPS 2014; Ecoscape 2019). Therefore, it is assumed that a low proportion of the movements the species could make within the DE will be at RSA height.

Turbine collision is dependent on the ability of a species to detect a turbine as well as its ability to avoid it. With the combination of high-speed turbine rotation and Carnaby's cockatoo likely traversing the DE in movement behaviour rather than distraction behaviours (foraging, courting or searching for habitat), detection of turbines is likely high.

Carnaby's cockatoo have been shown to potentially exhibit avoidance behaviour around areas with turbines in previous monitoring at Badgingarra Wind Farm. However, these results are over one year of monitoring and may be attributed to seasonal variation in population movements. Conservatively, Emerge Associates (2024a) assessed that there may be some changes to flock movements from turbines in which individuals show avoidance of areas close to turbines. Even with complete avoidance of the Parron Wind Farm area, ecological corridors still exist to the west and east of the DE which would allow north-south movement.

Given the fork-tailed swift widespread distribution and habitat being largely independent from terrestrial vegetation aside from insectivorous prey abundance, the DE presents no more desirable habitat values than any other patch of land across Australia. Given their propensity for short-lived and often incidental sightings as well as their migratory nature, the species is likely completely unencumbered by the urbanisation and development of land.

The *Avifauna Impact Risk Assessment* found the risk of indirect impacts to Carnaby's cockatoo and fork-tailed swift was low (Emerge Associates 2024a).

6.7 Environmental outcomes

The EPA objective for terrestrial fauna is '*to protect terrestrial fauna so that biological diversity and ecological integrity are maintained*'.

The Proposal can be implemented in a manner which achieves the EPA objective. The identified residual impacts are not considered to be significant. All potential indirect impacts can be mitigated

through the implementation of environmental management plans during the required works of the Proposal.

The risk that the Proposal would result in a direct, indirect or facilitated impact on terrestrial fauna is considered **low.** Impacts are in the first instance unlikely to occur. If impacts were to occur, their consequence is likely to be of marginal relevance to the species, and therefore not likely to be significant.

Of most relevance, the Proposal would not result in the permanent loss or removal of any black cockatoo foraging, potential breeding or potential roosting habitat, which has been a very deliberate part of its layout design.

The outcomes of the Proposal are predicted to be:

- No more than 0.04 ha impact to primary native vegetation habitat for fauna
- No impact to potential habitat trees with hollows
- Low risk to conservation significant and migratory species for bird and bat strike injury and mortality
- Low risk of barotrauma to bats
- Low risk of behavioural modifications in terrestrial fauna due to noise
- Low risk of disturbance and displacement of terrestrial fauna due to avoidance
- Condition 15 of the DA requires the implementation of the approved Environmental Assessment and Management Plan which specifically includes an Avifauna Monitoring Programme and will manage impacts to terrestrial fauna.

The Proposal is deemed unlikely to have a significant impact on terrestrial fauna. The Proposal is not likely to conflict with the EPA values and the EPA's objectives will be met.

7. Social Surroundings

7.1 EPA environmental factor and objective

The EPA's *Environmental Factor Guideline: Social Surroundings* (EPA 2023a) states that the broad objective for social surroundings is: '*to protect social surroundings from significant harm*'.

7.2 Relevant policy and guidance

The auxiliary investigations that have informed the Proposal have been conducted in accordance with the *Technical Guidance – Environmental impact assessment of Social Surroundings – Aboriginal cultural heritage (EPA 2023c)* and the *Environmental Factor Guideline: Social Surroundings* (EPA 2023a).

In addition, other guidance material that has been referenced includes:

- A *Noise Impact Assessment* (Herring Storer Acoustics 2024a) has been carried out in accordance with the EPA of South Australia "*Wind Farms – Environmental noise guidelines– July 2009, Updated November 2021*" (Guidelines) which is the guidelines recognised by DPLH for the planning assessment of wind farms, and *the Environmental Protection (Noise) Regulations 1997* will also apply to the operation of the windfarm.
- A Technical (Review) Report with *Advice on the Acoustic Assessment* prepared by DWER (2024b) for the Shire of Dandaragan.
- Updates to *Noise Impact Assessment* (Herring Storer Acoustics 2024b) to respond to DWER advice.
- Technical response to DWER advice prepared by Herring Storer Acoustics.
- A *Landscape and Visual Impact Assessment* (Emerge Associates 2024e) was undertaken in accordance with the method outlined within the Western Australian Planning Commission's (WAPC) *Visual Landscape Planning in Western Australia Manual* (WAPC 2007) (Visual Landscape Manual) with consideration of the state planning framework requirements.
- The *Australian Draft National Wind Farm Development Guidelines* (EPHC 2010) are the most recent and relevant Australian guidelines (based on international guidelines) and these guidelines were used for the electromagnetic interference assessment and the shadow flicker assessment.
- The aviation impact assessment was completed following the guidelines in *ISO 31000:2018 Risk Management – Guidelines* (Standards Australia Limited 2018).

7.3 Receiving environment

7.3.1 Studies and investigations

7.3.1.1. Cultural heritage

Noongar people are the Traditional Owners of the south-west of Western Australia, which incorporates the DE. The proposed action occurs across the South West Settlement Native Title, and within the Yued region.

In Western Australia, Aboriginal cultural heritage is currently managed pursuant to the *Aboriginal Heritage Act 1972,* which provides a framework for the recognition, protection, preservation and management of Aboriginal heritage. The Act requires approval for activities that may impact or harm Aboriginal heritage. The DPLH maintain the Aboriginal Cultural Heritage Inquiry System (ACHIS), which is a directory containing locations and information about Aboriginal Cultural Heritage (ACH) in the state.

In accordance with the *Aboriginal Heritage Due Diligence Guidelines* (DAA 2013), a search of the ACHIS online database (DPLH 2023) was undertaken to identify any Registered Aboriginal Heritage Sites or Other Heritage Places within the DE.

In order to determine the actual or potential presence of sites or features of non-indigenous heritage significance within the DE, a review of the Australian Heritage Database (DCCEEW 2022a), the State Heritage Office database (Heritage Council WA 2022) and the Local Heritage Survey (DPLH 2020) was undertaken within the DE:

- World Heritage Sites
- National Heritage Sites
- Commonwealth Heritage Places
- Sites listed in the State Register of Heritage Places.

A Heritage Protection Agreement (HPA) has been progressed between Yued and the Proponent and this will guide the completion of a cultural heritage survey that is underway and to be completed in early 2025. This will inform the preparation and implementation of a Cultural Heritage Management Plan to avoid impact to Yued heritage. A Relationship Agreement describing these processes has been executed. Continuing collaboration with Yued through these agreements will involve Yued in decision making associated with any new heritage values that may be identified during the course of implementing the Proposal.

7.3.1.2. Noise

A *Noise Impact Assessment* (Herring Storer Acoustics 2024b) was conducted for the proposed Parron Wind Farm development to support the DA application process. Noise levels were assessed at 25 receiver points at the DE (see **Figure 9**), and noise emissions calculated to comply with noise criteria based on background noise monitoring.

The assessment used the EPA of South Australia *'Wind Farms – Environmental noise guidelines- July 2009, Updated November 2021'* (Guidelines), which recommend the predicted equivalent noise level, adjusted for tonality in accordance with the Guidelines, should not exceed:

- 35 dB(A), or
- 40 dB(A) in a primary production or rural industry zone, or
- The 'Alternative Minimum Criteria' (varying with wind speed)
- The background noise by more than 5 dB(A).

The criteria for background noise levels varies with wind speed, consequently also the wind turbine generated noise. The criteria for wind turbine noise was determined based on background noise monitoring between March and May 2007. The assessment was based on the noise criteria which

was based on monitored background noise levels. The assessment notes that the Guidelines were developed to minimise the impact of noise on the amenity of premises that do not have a commercial landowner agreement with the wind farm developers (non-stakeholders). All identified residential premises in the surrounding area were included in the assessment, comprising both stakeholders and non-stakeholders. The Guidelines recommends that a noise level criteria not greater than 30 dB(A) indoors and 45 dB(A) outdoors is considered acceptable for stakeholder premises.

Noise modelling for emissions at residential premises was conducted using the computer program 'SoundPlan' version 9.0 to calculate the noise level at any location. Inputs to SoundPlan included topographical information, residential and wind turbine locations, and sound power levels with varying wind speed.

A Technical (Review) Report with *Advice on the Acoustic Assessment* (provided in **Appendix H**) was prepared by DWER for the Shire of Dandaragan. In response to DWER's advice, a Technical Response was prepared (provided in **Appendix I**), and the *Noise Impact Assessment* was updated to accommodate the DWER advice.

Further analysis of the noise impact of the Proposal was undertaken to inform a Technical Response, that took into account specific predominate wind speeds and directions. The basis for the further analysis was that the modelling methodology utilised in the assessment considered all wind directions instantaneously, which is a conservative approach that cannot realistically occur. When directional wind analysis was undertaken, it was demonstrated that the majority (all but one) of the external stakeholder premises comply with the criteria and the *Environmental Protection (Noise) Regulations 1997.* The relevant external premises (Receiver Point 2 and 24 as shown in **Figure 9**) have entered into landowner (stakeholder) agreements to respond to their proximity to WTG, and therefore form part of the noise emitting premises pursuant to the *Environmental Protection (Noise) Regulations 1997,* and are also consistent with the approach as specified in the SA Guidelines. Notwithstanding this, there is expected to be further micro-siting of WTG that will be relevant for noise emissions at surrounding premises and also the requirement to prepare Noise Mitigation Plan as part of the DA conditions.

Thresholds specified in Condition 9 of the DA (**Appendix A**) are in accordance with the Guidelines and the condition requires:

Noise from the operational approved development shall not exceed more than 5dB(A) above the background noise level or 35dB(A) (using LA90), whichever is the greater, at surrounding noise sensitive premises located outside the approved development boundary unless the noise sensitive premises is the subject of a neighbour waiver agreement with the relevant landowner, for which 30dB(A) indoors and 45dB(A) outdoors shall not be exceeded.

Additionally, the requirement for a *Noise Mitigation Plan* is raised in Condition 10 of the DA, which states:

Prior to the commencement of construction, an updated Noise Mitigation Plan shall be submitted to and approved by the Shire of Dandaragan in consultation with the Department of Water and Environmental Regulation and thereafter implemented for the life of development to the satisfaction of the Shire of Dandaragan.

A postconstruction noise monitoring program is to be implemented to assess compliance with the noise limits. This is stipulated in Condition 13 of the DA as follows

The proponents shall develop and implement a post construction noise monitoring program at the noise sensitive receptors to assess compliance of the operational approved development with the noise limits. The postconstruction noise monitoring program shall be conducted at the same time of year as when the background noise measurements were recorded. Results of the program shall be forwarded to the Department Water and Environmental Regulation Noise Branch.

In addition to the above the *Environmental Protection (Noise) Regulations 1997* will apply to the future operation of the Proposal and will be demonstrated through the preparation and implementation of the Noise Mitigation Plan.

7.3.1.3. Visual amenity

A *Landscape and Visual Impact Assessment* was undertaken by Emerge Associates (2024e) for the DE (provided in **Appendix J**) following the Visual Landscape Planning in Western Australia Manual (WAPC 2007) (Visual Landscape Manual). The assessment comprised a viewshed analysis for the 79 turbines, based on both average and maximum hub height of 150 m and 170 m respectively, as well as a blade length of 80 m. The viewshed analysis was based on assessing the turbine visibility using topography only, to understand whether the turbines are likely to be visible. The assessment provided a categorised analysis, showing number of turbines that could be visible from any given location within 20 km of the project.

A site visit was undertaken to ground truth the outcomes of the analysis and determine locations where the proposed WTG may be visible. A 3D block model was prepared to replicate the anticipated views from selected viewpoint locations, and ten (10) of these were progressed to photomontages, including the following viewpoints:

- Pinnacles Desert
- Cervantes Road
- Bibby Road (west)
- Springhill Road
- Nylagarda Road
- Jurien Road
- Cantabilling Road
- Brand Highway
- Badgingarra town
- Bibby Road (east).

7.3.1.4. Shadow flicker and blade glint

Rotating turbine blades can cause shadow flicker, fluctuation of light levels as a result of the blades intermittently blocking the sun. Shadow flicker can occur at certain times of day when the sun's rays pass through the swept area of the rotating blades, which obstructs the sun and casts a moving shadow. The moving shadow may pass over a window providing natural light and affect viewers.

The accepted shadow flicker duration limits within the *Australian Draft National Wind Farm Development Guidelines* (EPHC 2010) are outlined below:

- Limit of 30 hours per year and 30 minutes per day **theoretical** (modelled) duration; and
- Limit of 10 hours per year and 30 minutes per day **realistic** (modelled) or **actual** (measured) duration.

Intermittent reflection of sunlight from the surface of the turbine blades is termed blade glint, and depends on the reflectivity of the blade surface, to some extent the colour and age of the blade, as well as the orientation of the nacelle, blade angle, and angle of the sun. Blade glint can occur temporarily at any location. Blade glint is potentially a distraction to drivers if roads are aligned toward turbines. If the road is at a higher altitude to the turbine hub the blade glint can be noticed as far as 10 km (for high reflectivity paint).

The *Shadow Flicker and Blade Glint Assessment* (Aurecon 2024b) was undertaken on all the nearby residences within 2 km of the wind farm, using WindPRO version 4.0 software (see **Appendix K**). The WindPRO model simulates the path of the sun during the year and can calculate the relative positions of the sun, wind turbines, residences and terrain to predict the possible shadow flicker durations in the vicinity of the DE from a purely geometrical standpoint. This calculation gives the theoretical number of shadow flicker hours experienced at each nearby residence.

7.3.1.5. Traffic

A *Traffic Impact Statement* (Porter Consulting Engineers 2024) was undertaken to consider the existing transport conditions surrounding the DE, various construction vehicle routes (including for over size and over mass (OSOM) vehicles), traffic generation of the proposed development during construction and operation, proposed access arrangements to the DE, and transport impact of the Proposal to the surrounding road network. The Proponent's preferred site access is via Cowalla Road, therefore this road was investigated further in the report.

A *Transport Route Study* by Rex J Andrews (2024) was prepared for the route Geraldton Port to the DE (221 km) for all turbine components. The study assessed a number of options and determined the most likely route. Each section of road from Geraldton to the DE was considered and it was determined whether modifications were required, if caution was required, and identified those sections that had parking areas.

7.3.1.6. Aviation

An *Aviation Impact Assessment* was conducted by Aviation Projects (2024) to assess the potential aviation impacts associated with the Proposal and provide aviation safety advice in respect of relevant requirements of air safety regulations and procedures and inform and document consultation with relevant aviation agencies. The assessment prepared an Aviation Impact Statement (AIS) for consideration by Airservices Australia, Civil Aviation Safety Authority (CASA) and the Australian Department of Defence. A qualitative risk assessment was conducted to determine the need for obstacle lighting and marking.

The assessment followed the NASF Guideline D: *Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers*. This Guideline helps identify the

potential aviation safety risks posed by WTG by providing information to developers and planning authorities. Potential safety risks include impacts on flight procedures, aviation communications, navigation, and surveillance facilities.

Analysis for the AIS considered the aeronautical impact of the WTGs on the following:

- The operation of nearby certified aerodromes
- The operation of nearby aircraft landing areas (uncertified aerodromes)
- Grid and air route LSALT
- Airspace protection
- Aviation facilities
- Radar installations
- Local aircraft operations.

7.3.1.7. Electromagnetic interference

Electromagnetic interference (EMI) can potentially occur when wind turbines interact with point-to-point microwave telecommunications, including radio and television broadcasts. EMI can be avoided by locating turbines outside of the microwave path. The established method to ensure no EMI from wind turbines is to keep structures out of the Fresnel zone. The Fresnel zone is represented as an ellipsoid around the line of sight between the two ends of the path (telecommunication towers). The second Fresnel zone is often used as a conservative safeguarding of the telecommunications links from potential interference from wind turbines. The second Fresnel zone radius was calculated using the distance between the start and end point and the frequency of the telecommunications path.

The *Electromagnetic Interference Assessment* by Aurecon (2024a) is based on The *Australian Draft National Wind Farm Development Guidelines* (EPHC 2010) and considered all known existing paths from the Australian Communications and Media Authority telecommunication license database and assumed an exclusion area of the second Fresnel zone. A conservative approach was taken to assess the proposed turbine locations in relation to the second Fresnel zone for each of the three identified telecommunication paths that pass close to the turbines.

7.3.2 Environmental values

7.3.2.1. Cultural heritage

A search of the ACHIS online database (DPLH 2023) did not identify any Registered Aboriginal Heritage Sites or Other Heritage Places within the DE. The closest Registered Aboriginal Cultural Heritage Place in proximity to the DE is JB1 SITE (Place 17118), which is approximately 5 km to the east near the Brand Hwy. This ACH place is not culturally sensitive and is classified as a Camp.

Not all Aboriginal cultural heritage values appear on the ACHIS register and archaeological assessment of the DE will be required after the completion of a cultural heritage survey.

Database searches for any non-indigenous heritage significance within the DE indicated there are no state registered heritage sites located within the DE. Nearby sites were identified using the Local Heritage Survey (DPLH 2020). Cattle Yards near Hill River on Cantabilling Rd Badgingarra, North of Hill River (Heritage Place No. 5832) is 6 km to the north of the DE. Badgingarra Research Station (Herbert

Sudholt's Farm) on Winjardie Rd Badgingarra (Heritage Place No. 5828) is 10 km to the east of the DE.

7.3.2.2. Noise

The *Noise Impact Assessment* predicted the noise level at each of the identified residential premises for each of the hub height wind speeds considered, and relative to the wind speed at 10 m above ground level.

Results of the assessment found that noise emissions complied with noise criteria based on background noise monitoring. Four (4) of the residential sites are 'stakeholder' premises and the noise levels at the 'stakeholder' premises comply with the criteria recommended by the SA Guidelines for such premises. The stakeholder premises would be part of the noise emitting premises pursuant to the *Environmental Protection (Noise) Regulations 1997.*

The *Advice on Acoustic Assessment* recommendations were prepared by DWER for the Shire of Dandaragan in response to a request for comment on the proposed development application for the Parron Wind Farm. The advice finds that compliance with the non-stakeholder criteria for the SA Guidelines and the *Environmental Protection (Noise) Regulations 1997* would be achieved at the relevant receivers identified, except:

- R4, where an exceedance of up to 2 dB at night-time is predicted, and
- R24, where a marginal exceedance of 1 dB at night-time is predicted.

An assessment of each cardinal wind direction was carried out, as discussed in Herring Storer Acoustics (2024b). The average wind direction of the area was used to ascertain what the actual noise impacts would likely be at R4 and R24 during the night period. The average wind direction during the night period was found to be such that the noise levels would be expected to be 0.5 – 2 dB lower at R4, and 3.5 – 6 dB lower at R24. The noise levels at R24 are therefore significantly under the night period criteria, and at R4 would be either below or marginally (0.5 dB) in excess.

Hence, the 'actual' wind conditions that could possibly occur during the nigh period are such that compliance with the regulations is likely met, with the risk of adverse noise impacts considered to be insignificant. Notwithstanding, the landowners relevant for R4 and @24 have entered into landowner (stakeholder) agreements in relation to their proximity to WTG. This also defines them as part of the noise emitting premises pursuant to the *Environmental Protection (Noise) Regulations 1997.*

7.3.2.3. Visual amenity

The *Landscape and Visual Impact Assessment* found that the 79 turbines will be visible from various locations to different extents. The existing landscape provides high and low ridges which screen or display individual turbines at different points in the landscape. Vegetation along some of the major roads is tall enough to screen views of the turbines at some locations. The turbines will be most visible in high points of the landscape where natural screening from hills (landform) is reduced.

Given the current extent of wind turbines in the area, the visual impacts are overall expected to be marginal (Emerge Associates 2024e). The turbines 'fit' well in the rural landscape character and the topography of the DE (which included a broader area than the project) complements the turbines by

providing high and low ridges to screen or display each structure at various points throughout the landscape. However, at a number of locations to the east of the DE, the project will introduce turbines where these were not previously visible. At some viewpoints, only the blades are likely to be visible, while at other locations the whole turbine is likely to be visible.

Existing turbines from adjacent wind farms are currently visible in many locations around the DE and in most cases, it is not expected that additional turbines will significantly alter the overall visual quality. Based on the existing landform and vegetation present, the visual quality of the rural landscape setting can be maintained.

7.3.2.4. Shadow flicker and blade glint

The *Shadow Flicker and Blade Glint Assessment* (Aurecon 2024b) found that four (4) of the dwellings have shadow flicker effects from the proposed turbines, of which three (3) are identified stakeholder dwellings. The requirements under the *Australian Draft National Wind Farm Development Guidelines* (EPHC 2010) do not apply to the stakeholder residences. One non-stakeholder residence is predicted to experience shadow flicker within the allowable duration limits under the *Australian Draft National Wind Farm Development Guidelines*.

Mitigation of blade glint requires the use of low reflectivity blades. Modern turbines use a non-reflective paint finish and materials, preventing glinting from the surface of the blades occurring, and the possibility of a strobing reflection when the blades are spinning. Blade glint will therefore not present a significant issue for the Proposal.

7.3.2.5. Traffic

The construction phase is the critical stage for traffic where there is considerably more traffic generated over the period for construction (up to 2 years). The peak construction period is anticipated to generate in the order of 275 vehicle trips daily with 183 light vehicle trips and 92 heavy vehicle trips should the workforce be accommodated offsite requiring all workers to travel to/from work each day. The movement of OSOM vehicles that will need to be appropriately managed to avoid congestion/delays to traffic along the proposed route from Geraldton Port.

The transport route in its current condition will require upgrades at several locations before it could be deemed suitable for transporting the proposed components. Modifications will be required to vegetation, pavement, Geraldton Port, Geraldton, Dongara, Cowalla Road, Cadda Road, and the DE. There will be an increase to existing traffic volume with light, heavy and oversized vehicles on the transport route.

7.3.2.6. Aviation

The assessment established that the Proposal is not located within 30 nautical miles (nm) of any certified aerodrome and there are no verified landing areas located within 3 nm of the Proposal, therefore there is no impact caused to aircraft landing areas by the Proposal. The Proposal will not impact the grid Lowest Safe Altitude or air routes and will not infringe any protection areas associated with aviation facilities. The DE is located outside the stated ranges of radar systems in the Perth area. As such, no impacts are expected to aviation.

Regarding hazard marking and lighting, the assessment made the following conclusions:

- Proposed WTGs must be reported to CASA
- CASA will review the proposed WTG development and make a recommendation for obstacle lighting if required
- Marking WTGs in white colour provides sufficient contrast with surrounding environment to maintain an acceptable level of safety while lowering visual impact
- Obstacle lighting is not required to maintain accepted aviation safety risks, noting that CASA may recommend certain WTGs to be lit.

7.3.2.7. Electromagnetic interference

The approach taken was conservative in assessing the proposed WTG locations in relation to the second Fresnel zone for each of the three identified telecommunication paths that pass close to the turbines. None of the proposed turbine locations were found to encroach on the second Fresnel zone exclusion areas around the telecommunication paths, therefore, no interference is expected.

7.4 Potential environmental impacts

7.4.1 Cultural heritage

There are no direct or indirect impacts expected to Registered sites. There is potential for impacts to unidentified sites.

7.4.2 Noise

Direct impact noise emissions at four (4) of the residential sites were found to exceed the non-stakeholder noise criteria of the SA Guidelines based on background monitoring. All premises that exceeded the non-stakeholder noise criteria based upon background noise monitoring are ‘stakeholder’ premises. The noise levels at the ‘stakeholder’ premises comply with the criteria recommended by the SA Guidelines for such premises.

Additionally, construction activities will create noise and vibration to sensitive receptors and also result in direct impacts.

7.4.3 Visual amenity

The outcomes of the *Landscape and Visual Impact Assessment* were that the proposed turbines will be variably visible from various locations, each to a different extent. The existing landscape provides high and low ridges which screen or display individual turbines at different points in the landscape. The turbines will be most visible in high points of the landscape where natural screening from hills is reduced.

Visual impacts (changes to viewer experience at the landscape level) are expected to be marginal. Existing turbines from the adjacent Emu Downs Wind Farm and Badgingarra Wind Fam are currently visible and interspersed with the natural landscape character units (LCU) and rural LCU of the area, and the project will largely be an extension of this.

The viewpoints with the most visual differences include viewpoints where existing turbines are not currently visible, creating changes between the current and proposed views. While views will change compared to the existing conditions, travelers using both Cantabilling Road and Brand Highway will have views of existing turbines and powerlines over longer distances (up to at least 15 km away in some locations) as strong linear or grouped features and the project will not substantially change the scale or intensity compared to the existing infrastructure visible.

7.4.4 Shadow flicker and blade glint

Shadow flicker is predicted for four (4) dwellings around the proposed wind farm. Three (3) of these residences are stakeholder dwellings (where requirements do not apply). One non-stakeholder dwelling is predicted to experience shadow flicker within allowable limits.

Blade glint will not cause significant impacts for the proposed wind farm due to the low reflectivity finish utilized for all modern turbine blades. This finish prevents glinting from the surface of the blades and the possibility of a strobing reflection when the turbine blades are spinning.

7.4.5 Traffic

The transport route in its current condition will require upgrades to several corners before it could be deemed suitable for transporting the proposed components. Modifications are required to bridges, overhead structures, overhead utilities, vegetation, pavement, Geraldton Port, Geraldton, Dongara, Cowalla Road, Cadda Road, Parron site.

There will be a direct impact due to an increase to existing traffic volumes with light, heavy and over-sized vehicles on the transport route.

7.4.6 Aviation

No direct or indirect impacts to aviation are expected.

7.4.7 Electromagnetic interference

No direct or indirect impacts due to EMI are expected.

7.5 Mitigation

Mitigation measures that will be implemented to minimise impacts on social surroundings and have followed the Western Australian mitigation hierarchy (Avoid, Minimise, Rehabilitate, Offset (Government of WA 2014)).

7.5.1 Cultural heritage

7.5.1.1. Avoid

The Proponent is carrying out the Proposal activities within the principle of avoidance. There are no Registered heritage sites within the DE and the Proposal will therefore achieve full avoidance of direct impacts to known sites.

There is a cultural heritage survey being undertaken within the site involving Yued to ensure that all heritage values are understood and impact avoided.

7.5.1.2. Minimise

A Cultural Heritage Management Plan will arise from the existing agreement obligations with Yued and is relevant within the scope of mitigation measures. Another aspect relevant to mitigation is the property title of the land which has been 'freehold' for many years.

There is a cultural heritage survey being completed prior to any works progressing and to ensure that any heritage values are understood, and impacts minimised accordingly. Cultural management will be determined with Yued. The cooperative design process will identify protocols for the Proponent such as, if employees or invitees of the Proponent identify any material suspected to be of Aboriginal or archaeological significance during site activities, works will be suspended immediately near any suspected material and the Site Manager informed. The Site Manager will suspend any further work and Yued will be contacted immediately as the first stakeholder to be informed. If the find involves human remains, then there is an obligation to also inform the Police. Additional works that could disturb the suspected material will remain on hold until guidance from Yued and advice from an appropriately qualified consultant or the DPLH has been received.

7.5.2 Noise

7.5.2.1. Avoid

Direct construction noise impacts will be avoided for works generating excessive noise and rock breaking through regulations that prevent these activities from occurring outside of the hours of 7am to 7pm or on a Sunday or Public Holiday.

7.5.2.2. Minimise

Noise impacts will be minimised through:

- Maintenance of noise suppression devices, to be in good condition on all operational machinery
- Machinery and equipment is to be shut down when not in use
- Machinery is only to be operated within the designated hours of operation
- Activities are to be scheduled to minimise the likelihood of noise nuisance
- Vehicles are to use the dedicated transport route
- Any complaints received regarding noise disturbance are to be recorded and followed up immediately to minimise the cause.

A Noise Mitigation Plan will be prepared (as Condition 10 requirement of the DA) to demonstrate that noise emissions will achieve compliance with the requirements of the in EPA of South Australia *Wind Farms – Environmental noise guidelines– July 2009, Updated November 2021*. The Proposal will need to comply with the *Environmental Protection (Noise) Regulations 1997* and the Noise Mitigation Plan will demonstrate this based on landowner/stakeholder agreements and the final layout accommodating any WTG micro-siting.

7.5.3 Visual amenity

7.5.3.1. Avoid

The most effective means of avoiding visual impacts is, during the site selection phase, to choose a site that is well removed from potential sensitive receivers, which has already been implemented for the Proposal.

The results of the *Landscape and Visual Impact Assessment* concluded that there may be very little negative effect on regional or local landscape quality and visual impact is either marginal or does not actually occur to an extent that requires management, or that can be managed in a practical sense.

7.5.3.2. Minimise

Visual impact mitigation measures will include:

- Considered positioning of roads, tracks and structures with reflective surfaces
- Appropriate spacing of turbines in the landscape
- Structures viewed from the surrounding national parks do not detract from experience.

7.5.4 Shadow flicker and blade glint

7.5.4.1. Minimise

Blade glint will be minimised through the use of non-reflective paint/materials.

7.5.5 Traffic

7.5.5.1. Minimise

Traffic management measures recommended in the *Traffic Impact Statement* recommend further investigation to be undertaken in regard to the existing pavement condition and sealing of Cowalla Road given the routine maintenance required for unsealed roads and the conditions often imposed on heavy vehicles using unsealed roads when the pavement is visibly wet.

The *Traffic Impact Statement* also identified that a short sealed left turn shoulder (BAL) should be provided on Brand Highway at Cowalla Road to accommodate left turning construction traffic. Further additional intersection works may also need to be provided to allow for the swept path of the 27.5m combination heavy vehicles anticipated to access the site throughout the construction works. The intersection of Brand Highway and Cowalla Road will also require temporary works to accommodate the swept paths of OSOM vehicles. These intersection modifications will need to be designed in liaison with Main Roads WA and will be subject to their approval processes.

Traffic impacts will be minimised through traffic management during construction to adequately warn contra-flow traffic of vehicles turning into and out of the site. Mitigation measures to ensure the tracking of dirt onto public roads is minimised include rumble grids, rock crossings, and monitoring of traffic. Sufficient on-site parking will be made available to prevent the parking of staff vehicles and queuing of heavy vehicles on public roads during construction. Consideration will be given to stock movements and grain/harvest movements with heavy vehicles that may share the transport route.

7.5.6 Aviation

7.5.6.1. Avoid

Impacts will be avoided for aviation as the Proposal is not located within 30 nm of any certified aerodrome, and there are no verified landing areas located within 3 nm of the Proposal. There is therefore no impact caused to aircraft landing areas by the Proposal. The Proposal will not impact the grid Lowest Safe Altitude or air routes and will not infringe any protection areas associated with aviation facilities. The DE is located outside the stated ranges of radar systems in the Perth area.

7.5.7 Electromagnetic interference

7.5.7.1. Avoid

Electromagnetic interference will be avoided by locating all turbines outside of the second Fresnel zone (microwave path).

7.6 Assessment and significance of residual impact

There is no potential residual impact to cultural heritage due to avoidance of Registered sites in the initial siting of the proposed wind farm.

The criteria specified within the SA Guidelines will be met at all surrounding sensitive premises, including four (4) residences that arestakeholders (given the stakeholder agreements that are in place). A Noise Mitigation Plan prepared and implemented to address Condition 10 of the DA will demonstrate how the Proposal meets the relevant criteria for the final design (following micro-siting) and the operational Proposal will need to comply with the *Environmental Protection (Noise) Criteria 1997*. Ongoing noise monitoring will demonstrate compliance with the Noise Mitigation Plan.

The Proposal is in a sparsely populated area of the wheatbelt, with a small number of properties that will experience moderate impact from the development. The wind farm will not be visible from primary tourist areas and visual impact will be negligible.

There will be shadow flicker from the wind turbines for four (4) of the identified dwellings in the DE. One of the dwellings is a non-stakeholder residence and is predicted to experience shadow flicker within allowable limits. Three (3) are stakeholder dwellings for whom the limits do not apply.

No evidence exists that supports the perception that noise and shadow flicker have adverse effects on human health. The Proposal is not expected to cause adverse health impacts.

7.7 Environmental outcomes

The EPA objective for social surroundings is '*to protect social surroundings from significant harm*'.

The Proposal can be implemented in a manner which achieves the EPA objective. The identified residual impacts are not considered to be significant. All potential indirect impacts can be mitigated through the implementation of environmental management plans during the required works of the Proposal. There are no significant impacts expected to social surroundings through cultural heritage,

noise, visual amenity, shadow flicker, traffic, aviation and EMI. The outcomes of the Proposal are predicted to be:

- No impact to cultural heritage
- Noise emissions to be incompliance with the SA Guidelines and the *Environmental Protection (Noise) Regulations 1997*.
- Low visual amenity impact
- Low impacts of shadow flicker
- No impact of blade glint
- Low impacts to traffic
- No impact to aviation
- No impact to EMI.

8. Other Environmental Factors and Matters

Table 17 describes the receiving environment, impacts, mitigations and outcomes for the non-key environmental factors of:

- Landforms
- Subterranean Fauna
- Terrestrial Environmental Quality
- Inland Waters
- Air Quality
- Greenhouse Gas
- Human Health.

Sea factors are not considered relevant.

Table 17: Other Environmental Factors and Matters

EPA factor	Surveys / investigations undertaken and key environmental values	Potential impact(s) – based on the surveys	Outcomes / management of impacts
Landforms	• Fine scale soil landscape mapping (DPIRD 2022a). • The DE is not known to contain any restricted landforms or unique geological features. • Soil in the DE is mapped as mostly Yerramullah 3 Subsystem which is described as Colluvial slopes and some plateau remnants, very gently to gently inclined hillslopes and sand filled minor valleys; pale and yellow deep sands, pale sandy gravels, shallow gravel over duricrust, some sandy duplexes and sandy earths. • The elevation of the DE ranges from 94 mAHD in the north-western corner, to 278 mAHD in the center to south-western corner of the DE.	• There will be no impacts on the receiving environment landform and its defining features. • The Proposal will have no impact on the bordering Badgingarra National Park. • The Proposal will not involve removal or alteration of the landform's defining geology, morphology or abiotic processes and the level of dependent environmental values.	No significant impacts to landforms are expected as a consequence of the Proposal as the local landform will not be significantly altered.
Subterranean fauna	Subterranean fauna habitat has not been identified within the DE.	The project does not require large scale dewatering, clearing or excavation. Subterranean fauna is unlikely in the area. Impacts are therefore unlikely.	The Jurien groundwater allocation plan guides how to manage the needs of the groundwater-dependent ecosystems (including subterranean fauna) by maintaining adequate groundwater levels in unconfined and semi-confined aquifers. The *Guidelines for assessing the potential impacts on groundwater-dependent ecosystems when applying for a groundwater licence* (DoW 2010b) are used in conjunction with *Operational policy no. 5.12* to determine a licensee's requirements where the application is likely to affect a groundwater-dependent ecosystem. Impacts to subterranean fauna will be assessed when application is made for a 5C groundwater licence.

Table 17: Other Environmental Factors and Matters (continued)

EPA factor	Surveys / investigations undertaken and key environmental values	Potential impact(s) – based on the surveys	Outcomes / management of impacts
Terrestrial environmental quality	Land was cleared in the 1950s and currently supports very little native vegetation cover over the soil; 95% is pastoral grazing land. There is a low risk of acid sulfate soils.	• Clearing of vegetation can result in loss of nutrients in the soil • Soil is prone to erosion when the surface cover is removed and the organic matter oxidised • Net loss of nutrients and leakage is usually greater than under natural conditions Impacts to terrestrial environmental quality from clearing of agricultural vegetation at the DE are unlikely.	Terrestrial environmental quality will not be impacted by the Proposal. The cleared sites will have the least ecological significance to limit potential impact it may have on terrestrial environmental quality.
Inland waters	There are no significant wetlands or water bodies within the DE. The Hill River is a major tributary that passes to the north-east of the DE, outside the DE boundary. No Ramsar or listed 'important wetlands' are located within or near the DE. The DE is not located within a proclaimed Public Drinking Water Source Area (PDWSA).	Minor groundwater abstraction may be required during the construction of the Proposal which can potentially lower groundwater aquifer levels.	No significant impacts on inland waters-related environmental values expected given the groundwater abstraction will be temporary and cease at conclusion of construction. Groundwater abstraction will be managed under RIWI Act. Best practice will be used to minimise impact of oils, fuels and other chemicals.
Air quality	Primary contributors to current air quality are private vehicles and agricultural operations. Neither source is considered significant.	Dust is produced by light and heavy vehicles, clearing and topsoil stripping activities, to varying degrees and depending on weather conditions. Impacts of dust are: • Condition impacts to vegetation. • Amenity/nuisance impacts in and around surrounding area.	Residual impacts of dust will be low in intensity and temporary in nature, these are considered to be insignificant.

Table 17: Other Environmental Factors and Matters (continued)

EPA factor	Surveys / investigations undertaken and key environmental values	Potential impact(s) – based on the surveys	Outcomes / management of impacts
Greenhouse Gas	Wind power replaces the need for burning fossil fuels and therefore has positive overall environmental impacts in terms of Greenhouse Gas Emissions. The vast majority of the DE has been extensively cleared for agriculture with only minimal remnant vegetation remaining.	Emissions are associated with vegetation clearing, fuel for construction, fuel for vegetation removal, and turbine assembly.	The Proposal will not exceed EPA's Greenhouse Gas Emissions factor guidelines. Scope 1 emissions will be below 100,000 t CO_2-e annually and Scope 2 emissions will be below 100,000 t CO_2-e annually. The Proposal presents no significant impacts to greenhouse gas emissions and will result in a net benefit in comparison to fossil fuel alternatives.
Human health	No surveys or investigations were undertaken regarding radioactive substances or emissions.	No radioactive substances or emissions are associated with the Proposal.	Electromagnetic interference will be avoided by locating all turbines outside of the microwave path.

9. Offsets

The assessment of residual impacts, following application of the mitigation hierarchy, has indicated whilst some impacts are expected as a result of the Proposal, these can be managed and there is no significant residual impact predicted. Accordingly, no offsets have been proposed.

10. Matters of National Environmental Significance

Under the EPBC Act, proposals that have the potential to significantly impact MNES should be referred to the Minister for the Environment (via DCCEEW) to determine if the activities require further formal assessment as a controlled action. The Proposal was part of the original Badgingarra Wind Farm proposed action (EPBC 2008/4065) therefore a proposed wind farm layout has been previously considered in relation to environmental conditions and acceptability through the historic referral of the Badgingarra Wind Farm pursuant to the EPBC Act. The referral decision on the original Badgingarra Wind Farm proposal was 'Not a controlled action'. As outlined in **Section 2.1.2**, the Proponent has referred the Proposal pursuant to the EPBC Act.

A summary of the MNES categories are outlined in **Table 18**. Based on the results of the investigations specific to the DE (as discussed in **Section 1.1.2**) the Proposal has the potential to impact on a number of listed threatened species.

Table 18: Summary of MNES identified of relevance to the Parron wind farm

Matters of National Environmental Significance	MNES identified within 20 km of the DE based on PMST	Relevance to the Proposal
World Heritage Properties	There are no World Heritage areas in the vicinity of the DE.	Not relevant.
National Heritage Places	One National Heritage Place (Lesueur National Park) is identified within 20 km of the DE.	The Lesueur National Park is located approximately 20 km from the DE and is not relevant. The Proposal would have negligible impact to the Lesueur National Park
Wetlands of National Importance (Ramsar)	There are no Wetlands of International Importance in the vicinity of the DE.	Not relevant.
Great Barrier Reef Marine Park	The DE is not located in a Commonwealth marine area.	Not relevant.
Commonwealth Marine Area	The DE is not located in the Great Barrier Reef Marine Park.	Not relevant.

Table 18: Summary of MNES identified of relevance to the Parron wind farm (continued)

Matters of National Environmental Significance	MNES identified within 20 km of the DE based on PMST	Relevance to the Proposal
Listed Threatened Species and Ecological Communities	57 threatened species were identified within 20 km of the DE (birds – 10, mammals – 4, plants – 41, reptile – 1, shark - 1) Two listed Threatened Ecological Communities (TEC) Banksia Woodlands of the Swan Coastal Plain ecological community (Endangered) and Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community were identified in the 20 km buffer area of the DE only	• 10 conservation significant flora and 1 conservation significant fauna species were considered likely to occur or were recorded during the ecological surveys. • The assessment of likelihood of occurrence for all threatened flora species identified in the PMST search is included in Table 1 in **Appendix F**. • The assessment of likelihood of occurrence for all threatened fauna species identified in the PMST search results are included in Table 1 in **Appendix F**. • Further refinement of the likelihood of occurrence found no MNES threatened flora species were likely to occur, and two (2) MNES threatened fauna species were likely to occur. • As both of the listed TECs that were identified within 20 km of the DE only occur in the Swan Coastal Plain IBRA region and the DE occurs in the Geraldton Sandplains IBRA region it is unlikely that these TEC's occur in the DE. Surveys confirmed that no TECs or PECs occur within the DE. The assessment of likelihood of occurrence for threatened ecological communities is included in Table 2 in **Appendix F**.
Listed Migratory Species	10 migratory species were identified within 20 km of the DE (migratory marine birds – 1, migratory marine species – 1, migratory terrestrial species – 1, migratory wetland species – 7)	• 1 migratory species may occasionally occur in the vicinity of the DE but significant impacts are unlikely. • The assessment of likelihood of occurrence for all threatened and migratory fauna species identified in the PMST search results are included in Table 1 in **Appendix F**.
Nuclear actions (including uranium mines)	The DE is not likely to represent a significant impact to the environmental resulting from a Nuclear Action.	Not relevant.
Water resources, in relation to coal seam gas development and large coal mining development	The DE is not a coal seam gas or coal mining development.	Not relevant.

11. Holistic Impact Assessment

Holistic impact considers the 'connections and interactions between impacts, and the overall impact of the Proposal on the environment as a whole' (EPA 2023b). Where the combination of the environmental effect of two or more environmental factors or values has the potential to result in a significant impact, a holistic impact assessment of the Proposal on the environment is required (EPA 2024). An assessment may find the EPA's objective can be met for each factor; however, when seen as a whole or at a larger scale this might not be the case. Holistic impacts of the proposed development are concerned with regional biodiversity, ecosystem integrity and the social environment.

Based on EPA guidance, the holistic impact assessment should provide a holistic assessment of the impacts of the Proposal on the whole environment, including discussion of the connections and interactions between the parts of the environment (environmental factors) and the predicted outcomes in relation to the environmental principles and the EPA's environmental objectives.

One possible interconnection between environmental factors in the Proposal is between Flora and Vegetation and Terrestrial Fauna. This interaction is observed in the reliance of terrestrial fauna on flora and vegetation for habitat, movement, refuge and food, and flora and vegetation on terrestrial fauna in the form of pollination and seed dispersal. Potential holistic impacts to be considered include the fragmentation of vegetation adjacent and external to the DE limiting fauna movements, and the degradation of fauna habitat due to DE modifications.

As the Proposal will not result in the loss of any intact native vegetation in 'good' or better condition through clearing, possible holistic impacts resulting from the interconnection between the key environmental factors Flora and Vegetation and Terrestrial Fauna will not be significant.

12. Cumulative Environmental Impact Assessment

12.1 Potential cumulative impacts of current and proposed development

Cumulative environmental impacts are the 'successive, incremental and interactive impacts on the environment of a Proposal with one or more past, present and reasonably foreseeable future activities' (EPA 2024). In considering cumulative environmental impacts, it is important to regard the regional scale. To assess the cumulative impacts associated with the Proposal the impacts identified during the assessment of the key factors have been considered in the context of developments within the broader local context. An assessment of other current and future significant projects in the surrounding area that contribute to the potential cumulative impact of the development are detailed in **Table 19**.

Table 19: Significant projects in the surrounding area

Project Name	Location	Distance & direction from DE boundary	Description and relevance to the Proposal
Badgingarra Wind Farm	30 km east of Cervantes	Adjacent on eastern boundary, west of Yellamullah Rd	Construction completed 2019 Operates 37 WTG
Emu Downs Wind Farm	30 km east of Cervantes	5 km south	Construction completed 2006 Operates 48 WTG
Waddi Wind Farm	15 km north-west of Dandaragan	30 km south-east	In development Will operate up to 18 WTG
Yandin Wind Farm	5 km south-west of Dandaragan	50 km south-east	Construction completed 2021 Operates 51 WTG
Warradarge Wind Farm	30 km south-east of Eneabba	50 km north-east	Construction completed end 2020 Ooperates 51 WTG

Cumulative visual impacts of wind turbines together with other wind farm turbines or other visually adverse elements of the landscape and ancillary facilities should be considered. Turbines have been constructed in surrounding areas (including the Emu Downs Wind Farm and Badgingarra Wind Farm) and cumulative impacts were considered during the site visit by locating viewpoints to capture representative photos of the project in the context of existing turbines, where relevant. It is not expected that the existing turbines will always be visible in the same locations where the proposed turbines will be, so cumulative impacts were not relevant across the entire DE.

Another potential cumulative impact of the Proposal is loss and fragmentation of native vegetation and surrounding remnant vegetation patches. Minimal intact native vegetation in 'good' or better condition will be cleared (0.04 ha), and the clearing of non-native vegetation within the DE will not cause additional fragmentation. The ecological linkages to larger patches of vegetation will be left intact.

12.2 Analysis of cumulative impacts

None of the significant projects listed in **Table 19** will result in significant impacts to flora and vegetation, terrestrial fauna and social surroundings and have all been considered through Federal and State processes.

No additional cumulative impacts resulting from network connections are required, as direct network connection is facilitated by and accommodated within the DF.

There will be additional road upgrades to facilitate haulage of WTG components from Geraldton Port to the DE. These will service other windfarm proposals, except the Cowalla Road/Brand Highway junction, which is specifically associated with the Proposal and is included as part of this Proposal. Additional road upgraded will be considered on a needs basis but are not considered to be material.

13. Conclusion

The environmental impact assessment process has identified Flora and Vegetation, Terrestrial Fauna, and Social Surroundings as the preliminary key environmental factors requiring detailed consideration. The impacts on these factors can be managed effectively through avoidance, minimisation, and mitigation strategies.

Key considerations of the Proposal were:

- Siting the project on predominantly cleared agricultural land with scattered non-native vegetation
- Avoiding all areas of intact native vegetation in 'good' or better condition and Carnaby's cockatoo habitat
- Implementing management measures to protect fauna during construction and operation
- Engaging with stakeholders throughout the planning and assessment process.

Environmental management and monitoring will be conducted throughout the life of the project, including the implementation of additional management plans (addressing conditions in the DA) to address potential impacts on flora, vegetation, fauna, and social surroundings.

Environmental impacts of the Parron Wind Farm project on key factors are not expected to be significant.

13.1 Flora and vegetation

The identified residual impacts to flora and vegetation are not considered to be significant. All potential indirect impacts can be mitigated through the implementation of environmental management plans during the required works of the Proposal. There will be no impact to native vegetation, TECs and PECs and threatened flora as a result of the Proposal. The environmental outcomes of the Proposal will be the permanent clearing of scattered non-native vegetation on pastoral land for roads, turbines and associated infrastructure. There will be no clearing of any pre-European vegetation associations that have <30% remaining. Condition 15 of the DA requires the implementation of an Environmental Assessment and Management Plan that includes a Construction Environmental Management Plan and associated Vegetation and Hygiene Management Plan. These management plans will ensure no detrimental impacts to adjacent vegetation. The EPA's objectives in relation to Flora and Vegetation will be met.

13.2 Terrestrial fauna

The identified residual impacts to Terrestrial Fauna are not considered to be significant. All potential indirect impacts can be mitigated through the implementation of environmental management plans during the required works of the Proposal. The Proposal outcomes predict there will be no impact to intact native vegetation habitat for fauna, and no impact to potential habitat trees with hollows. There will be a low risk to conservation significant and migratory species for bird and bat strike injury and mortality, a low risk of behavioural modifications in terrestrial fauna due to noise, and a low risk

of disturbance and displacement of terrestrial fauna due to avoidance. Additionally, there will be a low risk of barotrauma to bats. Condition 15 of the DA requires the implementation of the approved Environmental Assessment and Management Plan which specifically includes an Avifauna Monitoring Programme and will manage impacts to terrestrial fauna. The Proposal is deemed unlikely to have a significant impact on terrestrial fauna. The EPA's objectives in relation to Terrestrial Fauna will be met.

13.3 Social surroundings

The identified residual impacts to Social Surroundings are not considered to be significant. All potential direct and indirect impacts can be mitigated through avoidance and the implementation of environmental management plans during the required works of the Proposal. The Proposal will have no impact to cultural heritage, aviation and EMI. There will be a low visual amenity impacts and no unmanaged/unacceptable noise impact to any surrounding properties/dwellings, and landowner (stakeholder) agreements are in place for those in proximity to proposed WTG. Low impacts of shadow flicker and blade glint are to be managed. The Proposal will meet the EPA's objectives for Social Surroundings.

14. References

14.1 General references

Atlas of Living Australia (ALA) 2023, *Atlas of Living Australia - Spatial Portal*, <http://www.ala.org.au/>.

Aurecon 2024a, *Electromagnetic Interference Assessment*, Version 4.

Aurecon 2024b, *Shadow Flicker Assessment*, Version 2.

Aviation Projects 2024, *Aviation Impact Assessment Parron Wind Farm*, 109301-01 0.3.

Balmori-de la Puente, A. and Balmori, A. 2023, *Flight Type and Seasonal Movements Are Important Predictors for Avian Collisions in Wind Farms*, Birds, 4: 85-100.

Beard, J. S. 1990, *Plant Life of Western Australia*, Kangaroo Press Pty Ltd., Kenthurst, N.S.W.

Beard, J. S., Beeston, G. R., Harvey, J. M., Hopkins, A. J. M. and Shepherd, D. P. 2013, *The vegetation of Western Australia at the 1:3,000,000 scale. Explanatory memoir. Second edition.*, Conservation Science Western Australia, 9: 1-152.

BirdLife International 2022, *Important Bird Areas*, <http://datazone.birdlife.org/site/factsheet/northern-swan-coastal-plain-iba-australia>.

Blary, C., Bonadonna, F., Dussauze, E., Potier, S., Besnard, A. and Duriez, O. 2023, *Detection of wind turbines rotary motion by birds: A matter of speed and contrast.*, Conservation Science and Practice, 5(10).

Bureau of Meterology (BoM) 2024, *Climate Data Online*, <http://www.bom.gov.au/climate/data/>.

Brett Lane & Associates Pty Ltd 2008, *Proposed Badgingarra Wind Farm Flora and Fauna Assessment*, No. 7044 Version 1.9.

Department of Conservation and Land Management (CALM) 2003, *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, Perth, WA.

Christensen, P. and Strahan, R. 1984, *The Australian Museum Complete Book of Australian Mammals*, Angus and Robertson Publishers, Sydney.

Department of Aboriginal Affairs (DAA) 2013, *Aboriginal Heritage Due Diligence Guidelines (Version 3.0)*, Department of Aboriginal Affairs, Perth.

Department of Agriculture, Water and the Environment (DAWE) 2021, *Weeds of National Significance (WoNS)*, Centre for Invasive Species Solutions (CISS), <https://weeds.org.au/weeds-profiles/>.

Department of Agriculture, Water and the Environment (DAWE) 2022, *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo*, Canberra.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017a, *Ramsar Sites (DBCA-010)*.

Department of Biodiversity Conservation and Attractions (DBCA) 2017b, *Threatened and Priority Flora Database Search Results Ref. 30-0317FL*, Species and Communities Branch, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2018, *Directory of Important Wetlands in Australia - Western Australia (DBCA-045)*.

Department of Biodiversity Conservation and Attractions (DBCA) 2020, *Phytophthora Dieback Management Manual*, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022, *Lands of Interest (DBCA-012)*, <https://catalogue.data.wa.gov.au/dataset/dbca-lands-of-interest>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023a, *Geomorphic Wetlands, Cervantes Eneabba (DBCA-015)*, Perth, Western Australia.

C. a. A. Department of Biodiversity (DBCA) 2023b, *Geomorphic Wetlands, Cervantes Eneabba (DBCA-015)*

Perth, Western Australia.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023c, *Legislated Lands and Waters (DBCA-011)*, Perth, WA, <https://catalogue.data.wa.gov.au/dataset/dbca-lands-of-interest>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023d, *NatureMap*, <https://static.dbca.wa.gov.au/pages/naturemap.html>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023e, *Threatened Species and Communities - Data Searches*, Perth, WA, <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023f, *Weeds*, Perth, WA, <https://www.dbca.wa.gov.au/parks-and-wildlife-service/threat-management/plant-diseases/weeds#:~:text=Weeds%20are%20plants%20(not%20necessarily,detectable%20environmental%20or%20economic%20impacts>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2024, *Geomorphic Wetlands, Cervantes Eneabba (DBCA-015)*, Perth, Western Australia, <https://www.dbca.wa.gov.au/management/wetlands/wetland-mapping>.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2022a, *Australian Heritage Database*, <https://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=search_results;list_code=NHL;legal_status=65%3e>.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2022b, *Referral guideline for 3 WA threatened black cockatoo species*.

E. Department Climate Change, , the Environment and Water, (DCCEEW) 2023a, *Australia's emissions projections 2023*, Canberra.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023b, *Protected Matters Search Tool*, <https://pmst.awe.gov.au/#/map>.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023c, *Species Profile and Threats Database: Apus pacificus - Fork-tailed swift*, <https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=678>.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2024, *Protected Matters Search Tool*, <https://pmst.awe.gov.au/>.

Department of the Environment 2013, *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*, Commonwealth of Australia.

Department of the Environment and Energy (DoEE) 2016, *Modelled distribution for Carnaby's Cockatoo (Calyptorhynchus latirostris)*, Canberra.

Department of Water (DoW) 2008, *LiDAR Elevation Dataset, Swan Coastal Plain*, Perth.

Department of Parks and Wildlife (DPaW) 2013a, *Carnaby's cockatoo (Calyptorhynchus latirostris) Recovery Plan*, Perth, Western Australia.

Department of Parks and Wildlife (DPaW) 2013b, *Carnaby's Cockatoo (Calyptorphynchus latirostris) Recovery Plan*.

Department of Primary Industries and Regional Development (DPIRD) 2022a, *Soil Landscape Mapping - Systems (DPIRD-064)*.

Department of Primary Industries and Regional Development (DPIRD) 2022b, *Western Australian Organism List*, Perth, WA.

Department of Planning, Lands and Heritage (DPLH) 2020, *Local Heritage Survey (DPLH-008)*, Perth, Western Australia.

Department of Planning, Lands and Heritage (DPLH) 2023, *Aboriginal Cultural Heritage Inquiry Service*, <https://espatial.dplh.wa.gov.au/ACHIS/index.html?viewer=ACHIS>.

Department of Water and Environmental Regulation (DWER) 2018, *Hydrography Linear (Heirarchy) (DWER-031)*, Perth.

Department of Water and Environmental Regulation (DWER) 2021, *Water Register*, Perth, <https://maps.water.wa.gov.au/#/webmap/register>.

Department of Water and Environmental Regulation (DWER) 2023a, *Air Quality Monitoring Data*, <https://www.der.wa.gov.au/your-environment/air/air-quality-data>.

Department of Water and Environmental Regulation (DWER) 2023b, *ASS Risk Maps*, <https://gmapgis.com/acid_sulfate_soils_risk_map_western_australia.htm>.

Department of Water and Environment Regulation (DWER) 2024a, *Government Emissions Interim Target*, <https://www.wa.gov.au/service/environment/business-and-community-assistance/government-emissions-interim-target#:~:text=The%20Government%20of%20Western%20Australia,per%20cent%20below%202020%20levels.>.

Department of Water and Environment Regulation (DWER) 2024b, *Technical (Review) Report Advice on the acoustic assessment for the proposed Parron wind farm development in Badgingarra, prepared for the Shire of Dandaragan.*

Ecoscape 2019, *Carnaby's Cockatoo and Other Birds Year One Operational Monitoring*, 4309-19R, Ver 0.

Emerge Associates 2023, *Parron Wind Farm Development Support - Basic Fauna and Targeted Bird and Bat Assessment*, EP23-085(02)--004 AJU, Version 1.

Emerge Associates 2024a, *Avifauna Impact Risk Assessment*, EP23-085(18)--024B AJU, Version 1.

Emerge Associates 2024b, *Basic Fauna and Targeted Bird and Bat Assessment: Parron Wind Farm Development Support*, EP23-085(02).

Emerge Associates 2024c, *Detailed Flora and Vegetation Assessment - Parron Wind Farm Development Support*, EP23-085(01)--006 MS, Version 1.

Emerge Associates 2024d, *Parron Wind Farm Development Support - Detailed Flora and Vegetation Assessment*, EP23-085(01)--006 MS, Version 1.

Emerge Associates 2024e, *Stage 2 Visual Impact Assessment Parron Wind Farm Development*, EP23-085(14)—026 EKB, Version 1.

Environmental Protection Authority (EPA) 2016a, *Environmental Factor Guideline: Flora and Vegetation*, Perth.

Environmental Protection Authority (EPA) 2016b, *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* Perth.

Environmental Protection Authority (EPA) 2016c, *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, Perth.

Environmental Protection Authority (EPA) 2018, *Statement of Environmental Principles, Factors and Objectives*, Perth.

Environmental Protection Authority (EPA) 2020a, *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*, Joondalup, Western Australia.

Environment Protection Authority (EPA) 2020b, *Technical Guideance - Terrestrial vertebrate fauna surveys for environmental impact assessment*, Perth, Western Australia.

Environmental Protection Authority (EPA) 2021, *Statement of Environmental Principles, Factors, Objectives and aims of EIA*.

Environmental Protection Authority (EPA) 2023a, *Environmental factor Guideline Social Surroundings*.

Environmental Protection Authority (EPA) 2023b, *Statement of environmental principles, factors, objectives and aims of EIA*.

Environmental Protection Authority (EPA) 2023c, *Technical Guidance - Environmental impact assessment of Social Surroundings - Aboriginal cultural heritage*, Western Australia.

Environmental Protection Authority (EPA) 2024, *Instructions: How to prepare an environmental review document*.

Environment Protection and Heritage Council (EPHC) 2010, *National Wind Farm Development Guidelines - Draft*.

Gibson, N., Keighery, B., Keighery, G., Burbidge, A. and Lyons, M. 1994, *A Floristic survey of the southern Swan Coastal Plain*, Department of Conservation and Land Management and the Conservation Council of Western Australia, Perth.

Glossop, B., Clarke, K., Mitchell, D. and Barrett, G. 2011, *Methods for mapping Carnaby's cockatoo habitat*, Department of Environment and Conservation, Perth.

Government of WA 2014, *WA Environmental Offets Guidelines*, Perth.

Government of Western Australia 2018, *Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017*, WA Department of Biodiversity, Conservation and Attractions, Perth.

Griffin, E. A. and Hopkins, A. J. M. 1990, *Nature Conservation, Landcape and Recreational values of the Lesueur area - Vegetation*, Department of Conservation and Land Management,, Wanneroo, WA.

Heritage Council WA 2022, *State Heritage Office database*, Perth, Western Australia, <http://www.inherit.stateheritage.wa.gov.au/Public/>.

Herring Storer Acoustics 2024a, *Noise Impact Assessment Parron Wind Farm*, 32714-2-24117-02, Version 2.

Herring Storer Acoustics 2024b, *Noise Impact Assessment Parron Wind Farm*, 33167-5-24117-06, Version 4.

Hill, A. L., Semeniuk, C. A., Semeniuk, V. and Del Marco, A. 1996, *Wetlands of the Swan Coastal Plain: Volume 2A - Wetland Mapping, Classification and Evaluation*, Water and Rivers Commission and the Department of Environmental Protection, Perth.

Hobbs, R. J. 2003, *The Wheatbelt Region of Western Australia*, Pacific Conservation Biology 9(1): 9-11.

Keighery, B. 1994, *Bushland Plant Survey: A guide to plant community survey for the community*, Wildflower Society of WA (Inc), Nedlands.

Le Roux, C. 2017, *Nocturnal roost tree, roost site and landscape characteristics of Carnaby's Black-Cockatoo (Calyptorynchus latirostris) on the Swan Coastal Plain*, Edith Cowan University Research Online.

Marchant, S. and Higgins, P. J. 1990, *Handbook of Australian, New Zealand and Antarctic Birds. Volume One - Ratites to Ducks*, Oxford University Press, Melbourne, Victoria.

Department of Climate Change, Energy, the Environment and Water, (NGAF) 2022, *Australian National Greenhouse Accounts Factors*, Canberra, ACT.

Porter Consulting Engineers 2024, *Parron Wind Farm Traffic Impact Statement*, Version C.

Purdie, B., Tille, P. and Schoknecht, N. 2004, *Soil-landscape mapping in south-Western Australia: an overview of methodology and outputs. Resource Management Technical Report 280*, State of Western Australia.

Rex J Andrews 2024, *Route Study: Vestas Parron Wind Farm: Ex Geraldton*, 00.

Rix, M. G., Huey, J. A., Cooper, S. J. B., Austin, A. D. and Harvey, M. S. 2018, *Conservation systematics of the shield-backed trapdoor spiders of the nigrum-group (Mygalomorphae, Idiopidae, Idiosoma): integrative taxonomy reveals a diverse and threatened fauna from southwestern Australia.* , ZooKeys, 756: 1-121.

RPS Group (RPS) 2014, *Fauna Assessment - Waddi Wind Farm*. 113208, Version 3.

Saunders, D. A. 1977, *The effect of agricultural clearing on the breeding success of the White-tailed Black Cockatoo*, Emu, 77: 180-184.

Saunders, D. A. 1980, *Food and Movements of the Short-billed Form of the White-tailed Black Cockatoo*, Australian Wildlife Research, 7: 257-269.

Standards Australia Limited 2018, *AS ISO 31000:2018 Risk Management - Guidelines*, SAI Global Pty Limited, Version 3.

Transport Authorities Greenhouse Group 2013, *Greenhouse Gas Assessment Workbook for Road Projects*.

Western Australian Land Information Authority (WALIA) 2024, *Landgate Map Viewer Plus*, <https://map-viewer-plus.app.landgate.wa.gov.au/index.html>.

Western Australian Planning Commission (WAPC) 2007, *Visual Landscape Planning in Western Australia - a manual for evaluation, assessment, siting and design*, Perth.

Wetlands Advisory Committee 1977, *The status of reserves in System Six*, Environmental Protection Authority, Perth.

Figures

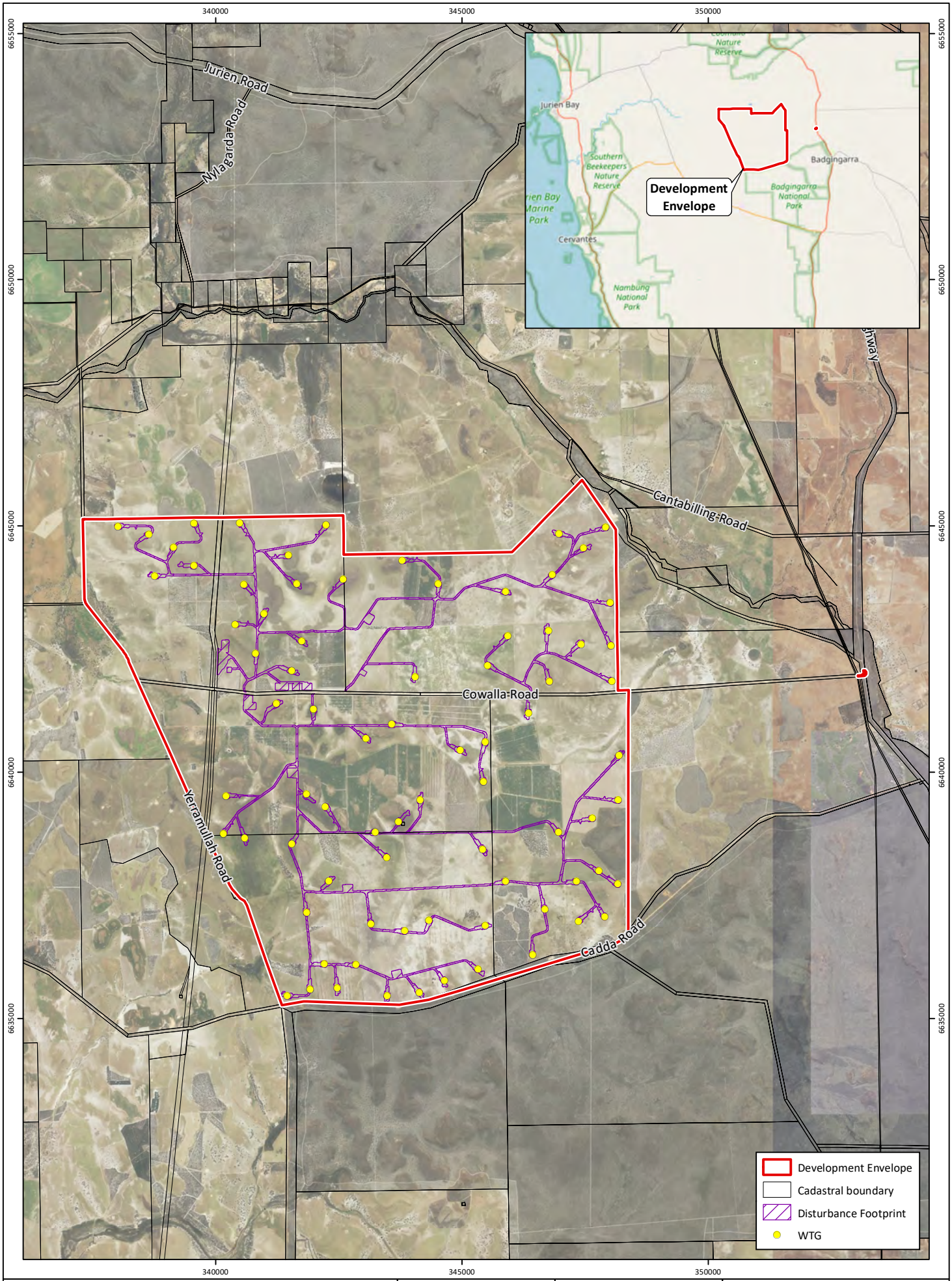


Figure 1: Site Location and Development Context

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F113

Drawn:	CTH
Date:	11/09/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 1 2
Kilometers

Scale: 1:100,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

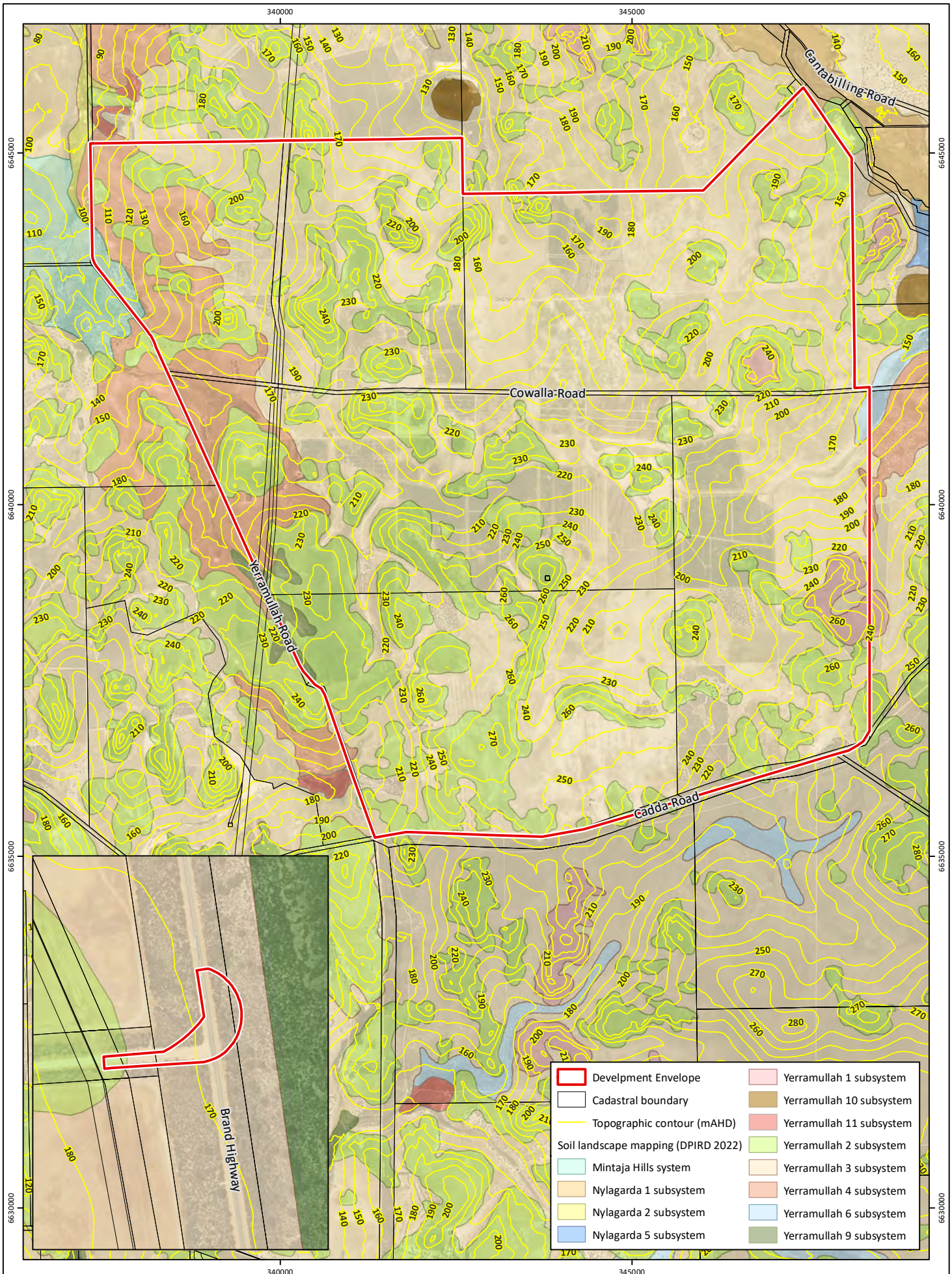


Figure 2: Topography and Soil Landscape

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number:
EP23-085(12)--F114

Drawn:	CTH
Date:	11/09/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 1 2
Kilometers

Scale: 1:70,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

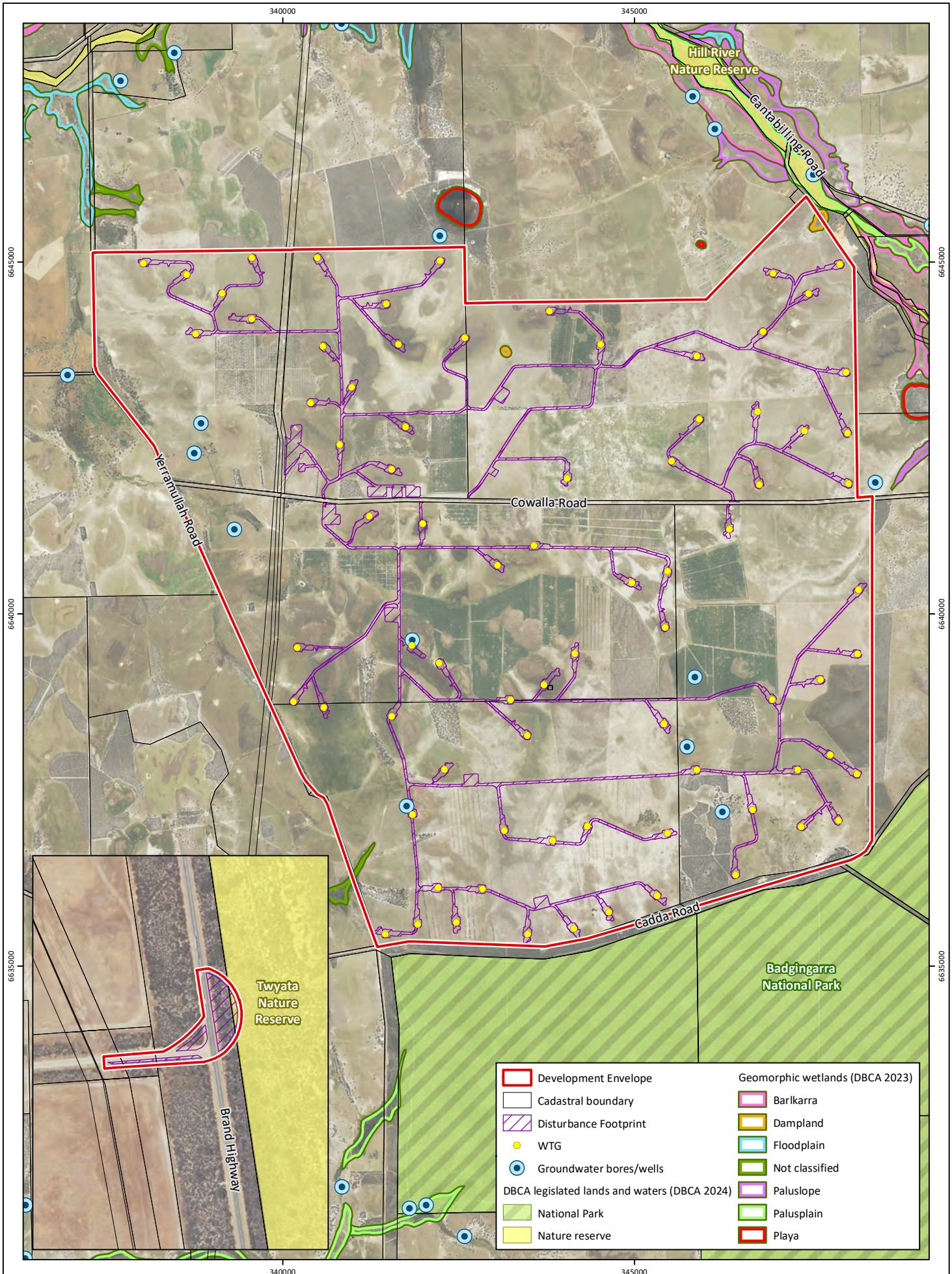


Figure 3: Geomorphic Wetlands and Hydrology

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number:
EP23-085(12)--F115
Drawn: WJC
Date: 11/11/2024
Checked: FIK
Approved: JDH
Date: 21/11/2024

N

0 1 2
Kilometers
Scale: 1:70,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

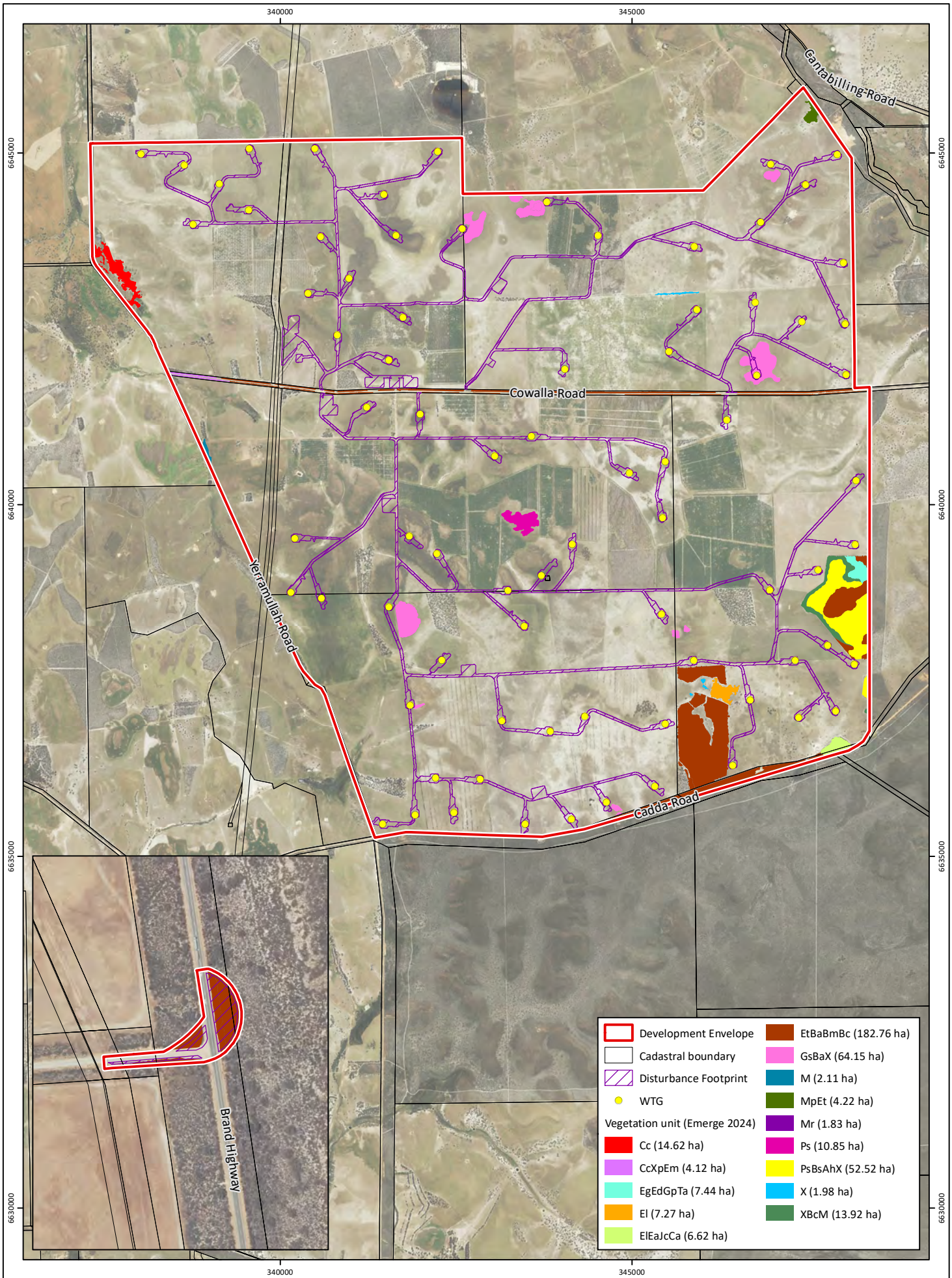


Figure 4: Plant Communities

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F116

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 1 2
Kilometers

Scale: 1:70,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

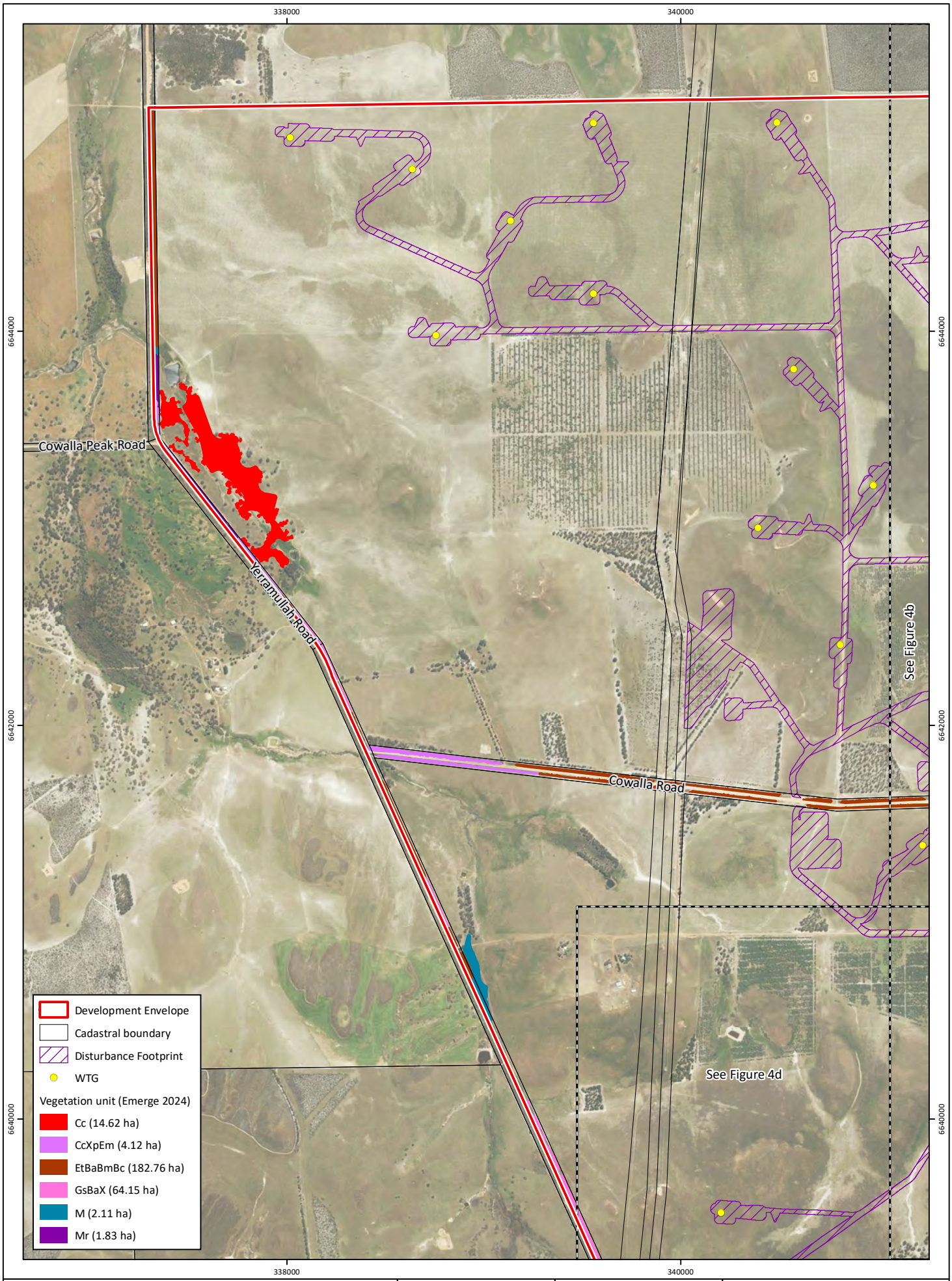


Figure 4a: Plant Communities

Project:	EP Act Referral Parron Wind Farm
Client:	Zephyr Energy

Plan Number:
EP23-085(12)--F116a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

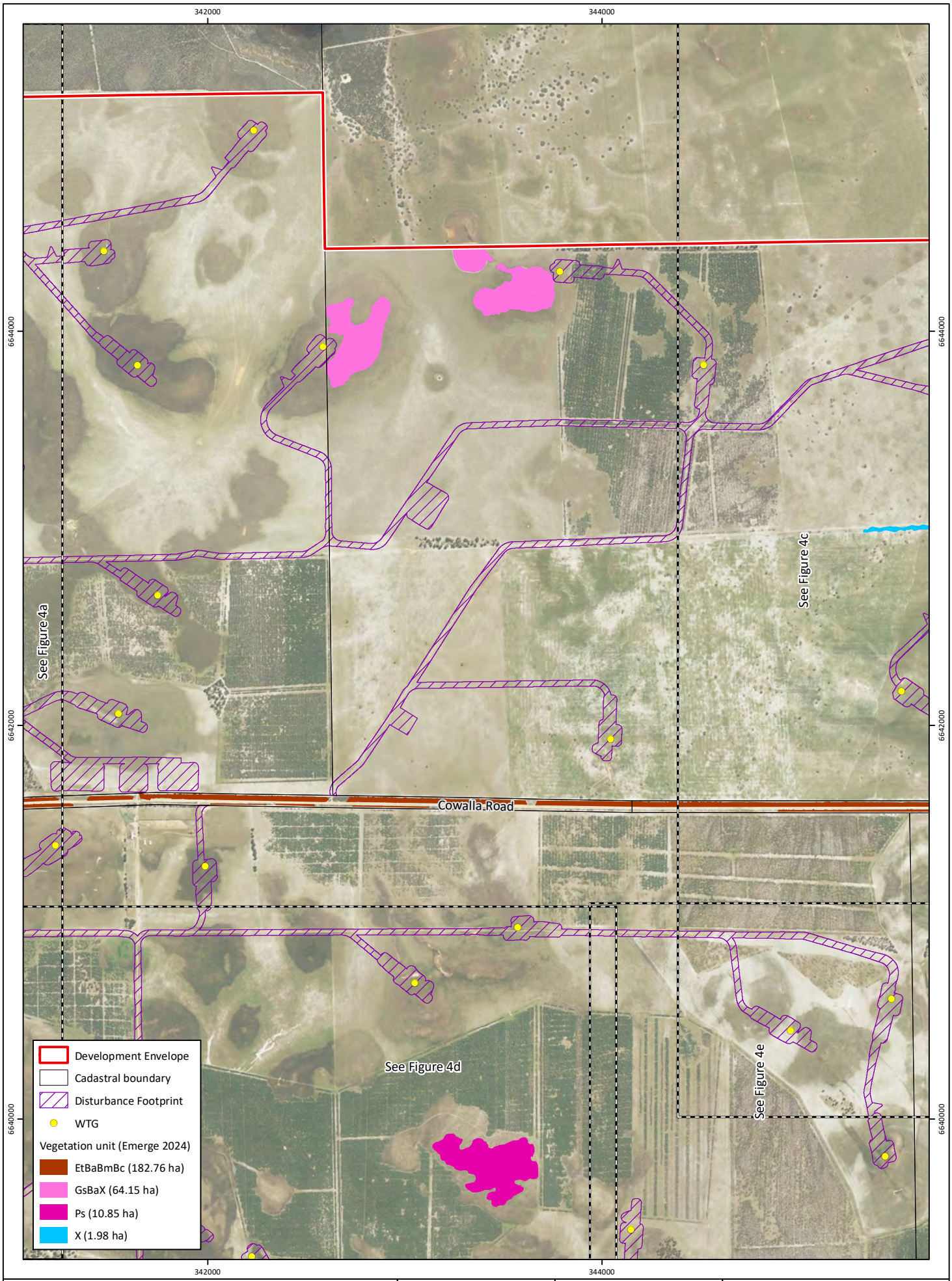


Figure 4b: Plant Communities

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F116a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

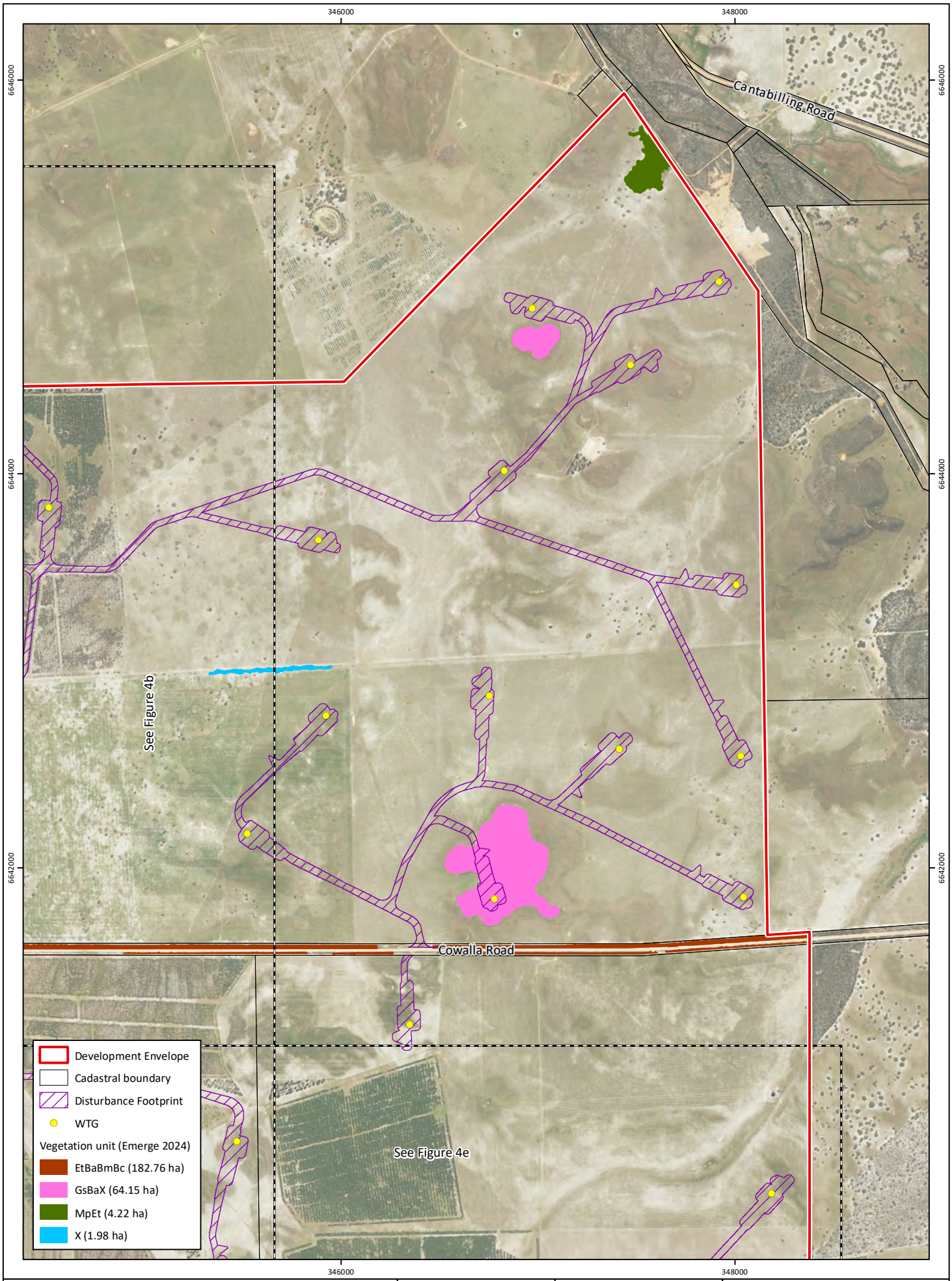


Figure 4c: Plant Communities

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F116a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

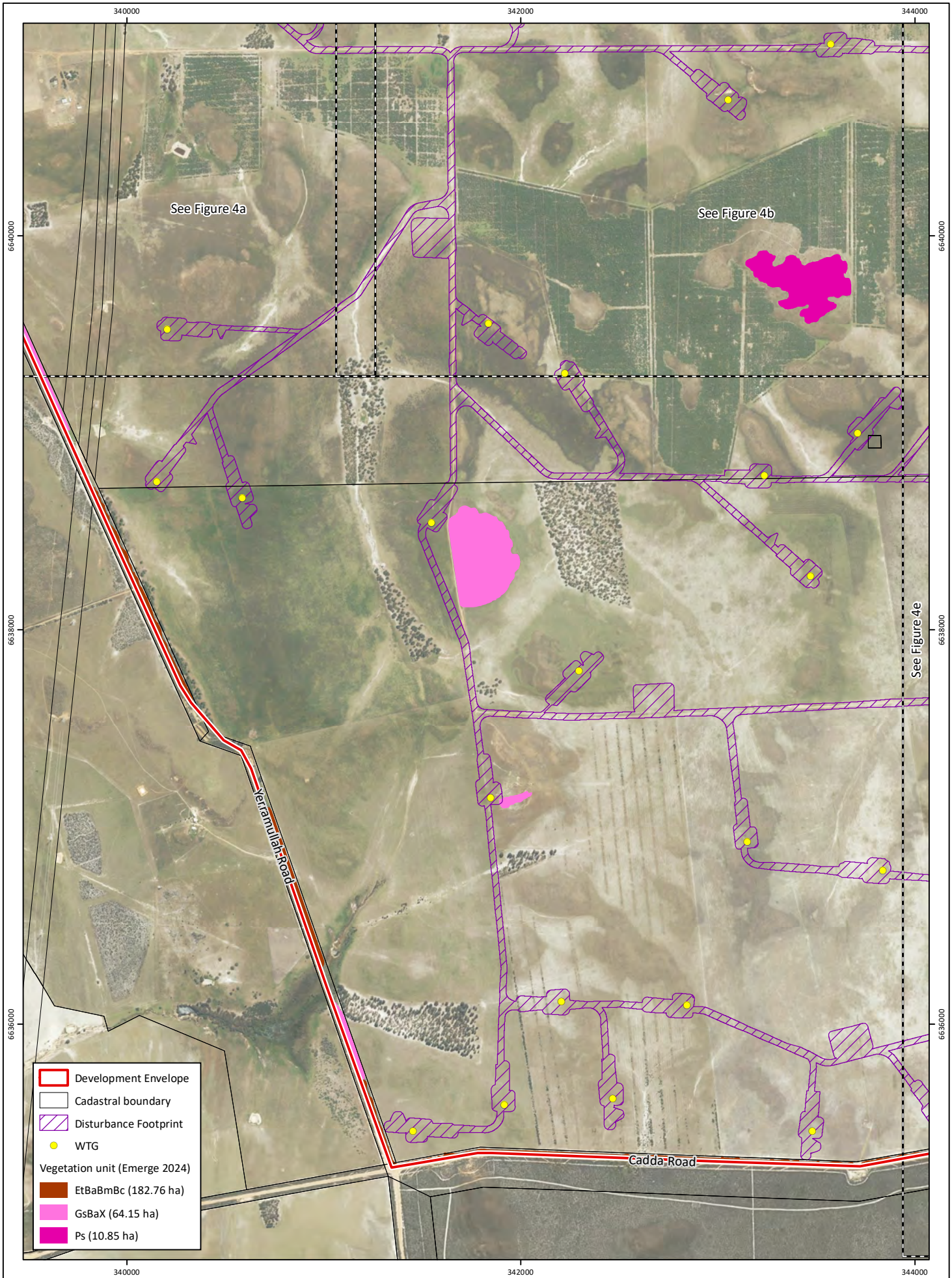


Figure 4d: Plant Communities

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number: EP23-085(12)--F116a
Drawn: WJC
Date: 11/11/2024
Checked: FIK
Approved: JDH
Date: 21/11/2024

N

0 250 500
Metres
Scale: 1:25,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

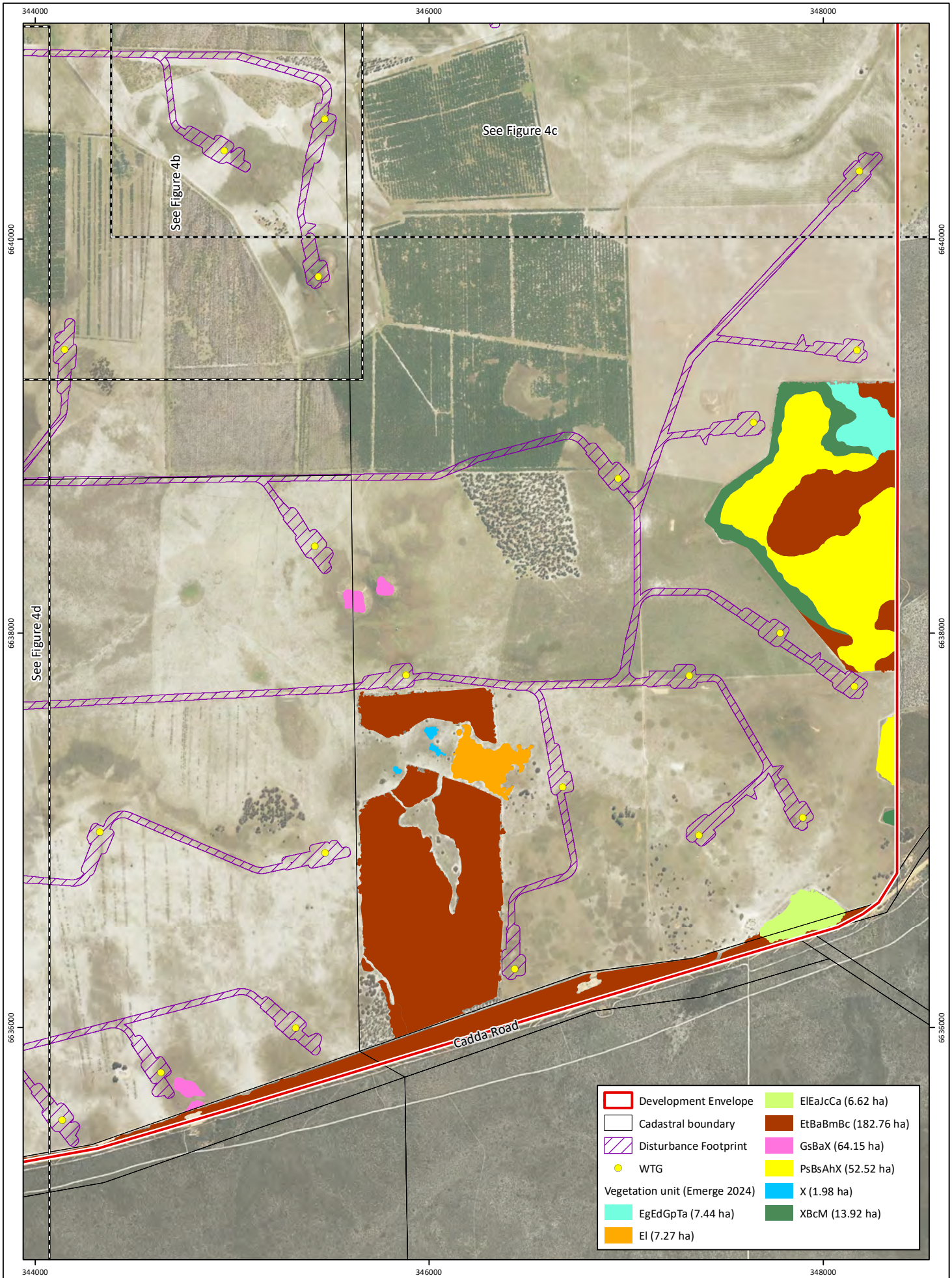


Figure 4e: Plant Communities

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F116a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

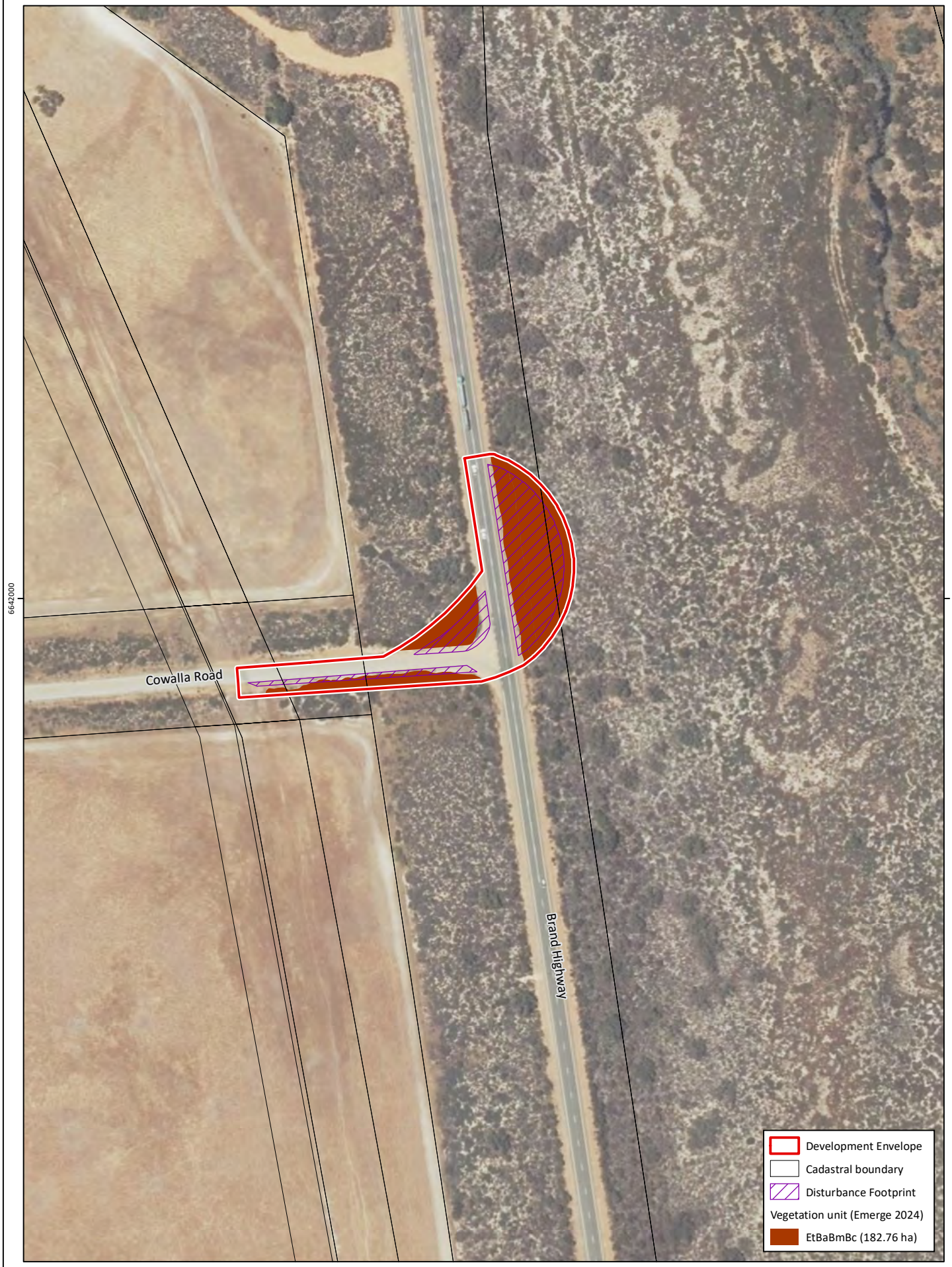


Figure 4f: Plant Communities

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number:
EP23-085(12)--F116a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 25 50
Metres

Scale: 1:2,500@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

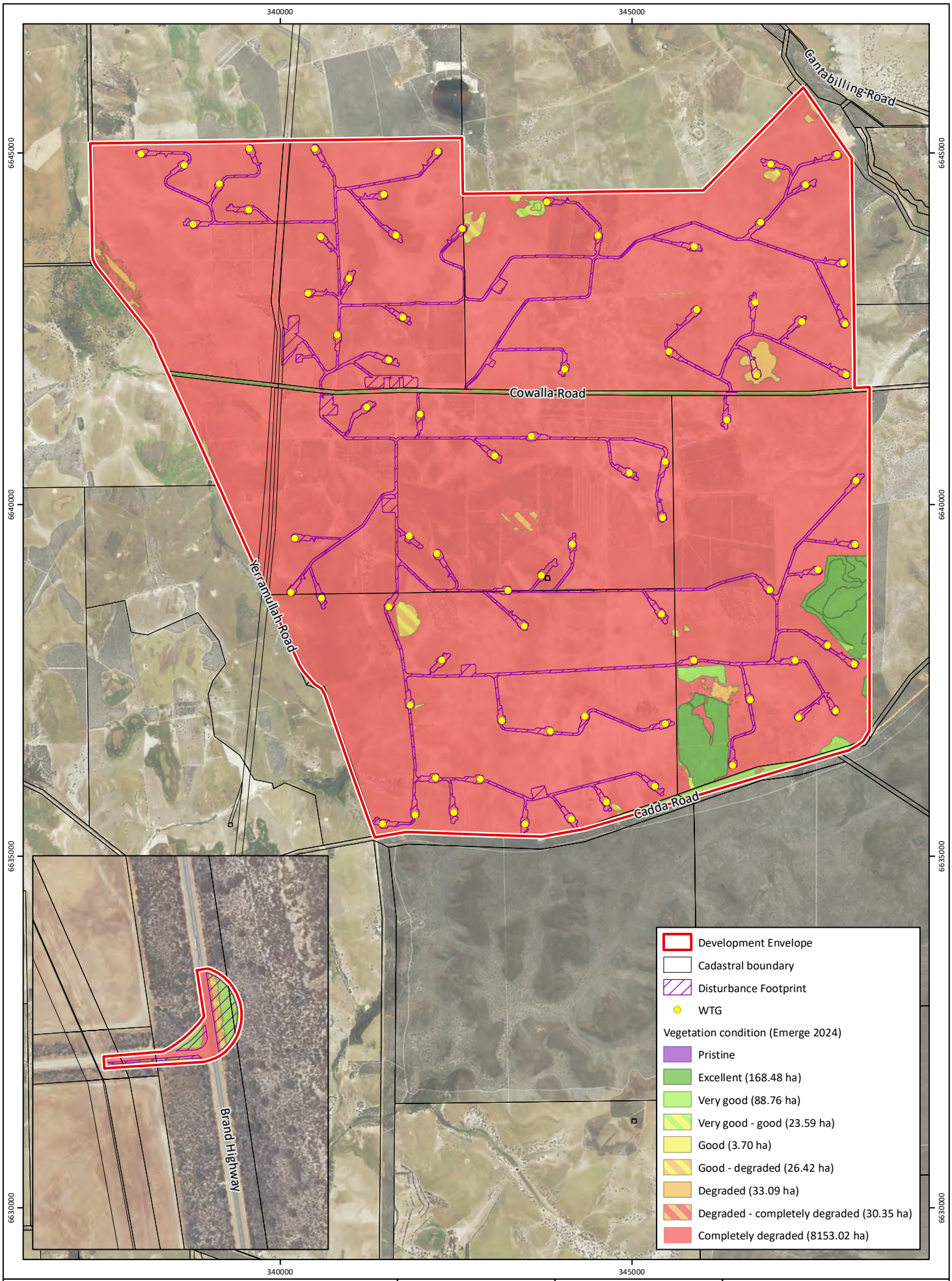


Figure 5: Vegetation Condition

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number:
EP23-085(12)--F117

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 1 2
Kilometers

Scale: 1:70,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

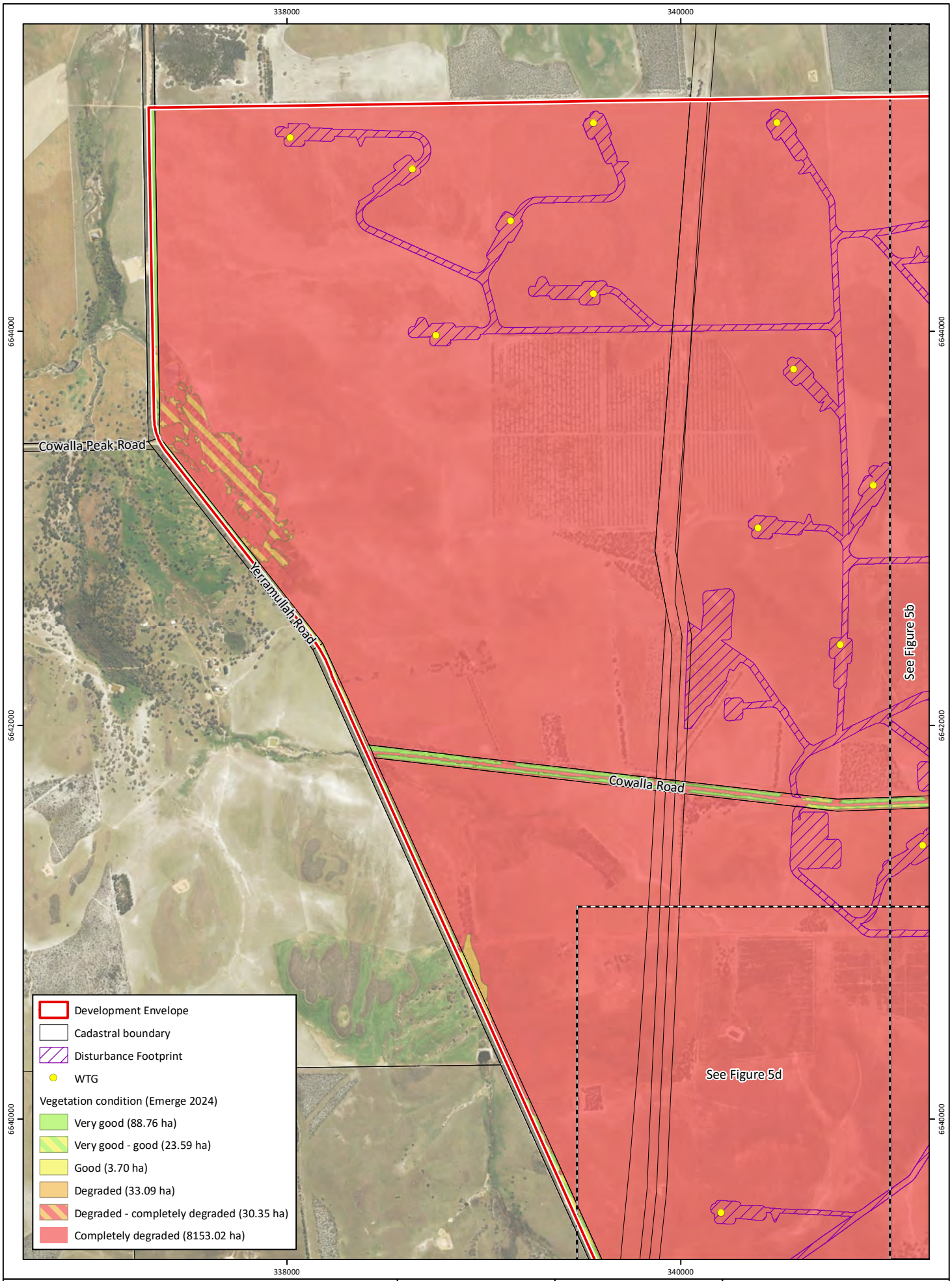


Figure 5a: Vegetation Condition

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F117a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

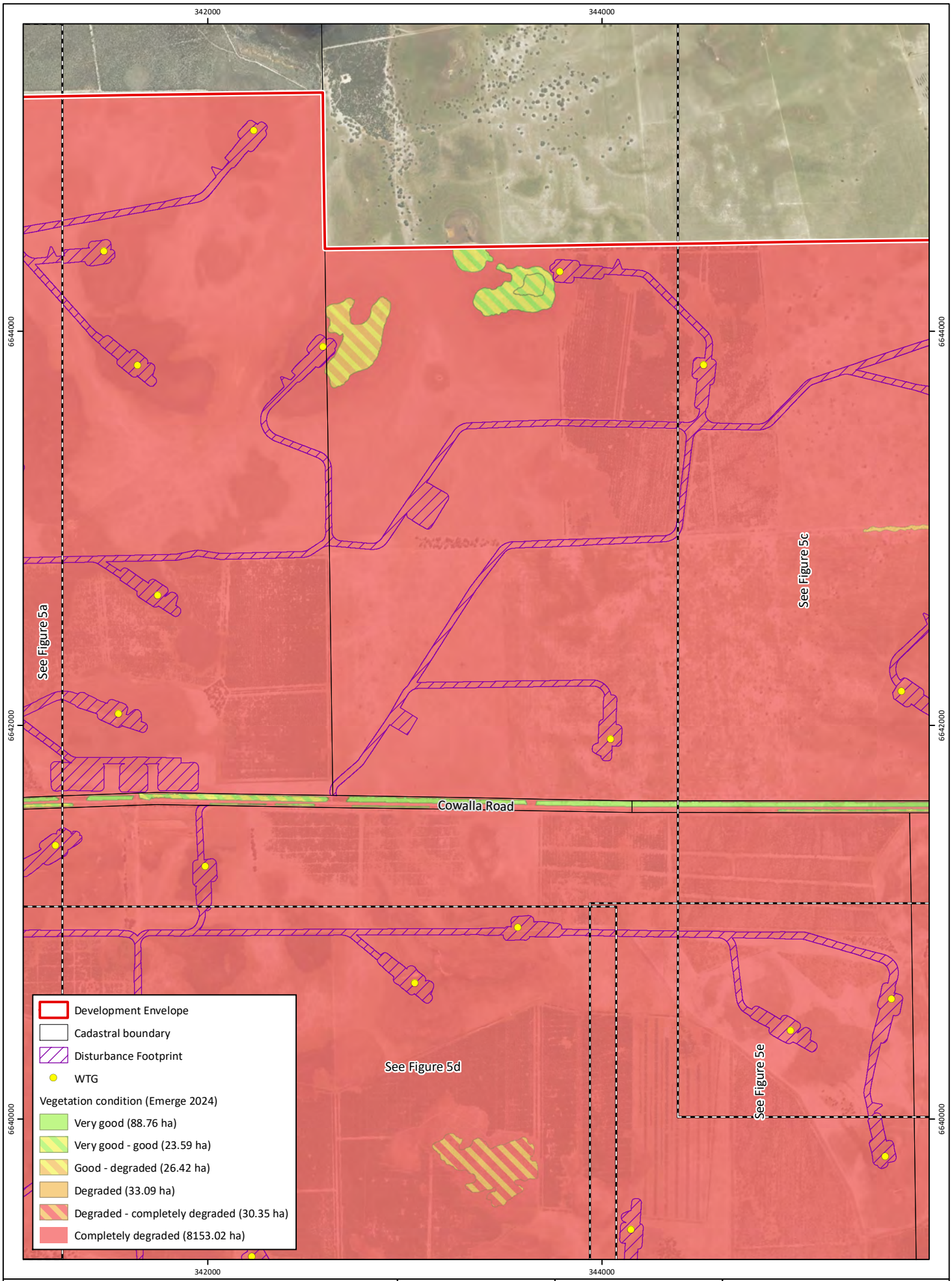


Figure 5b: Vegetation Condition

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number: EP23-085(12)--F117a
Drawn: WJC
Date: 11/11/2024
Checked: FIK
Approved: JDH
Date: 21/11/2024

N

0 250 500
Metres
Scale: 1:25,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

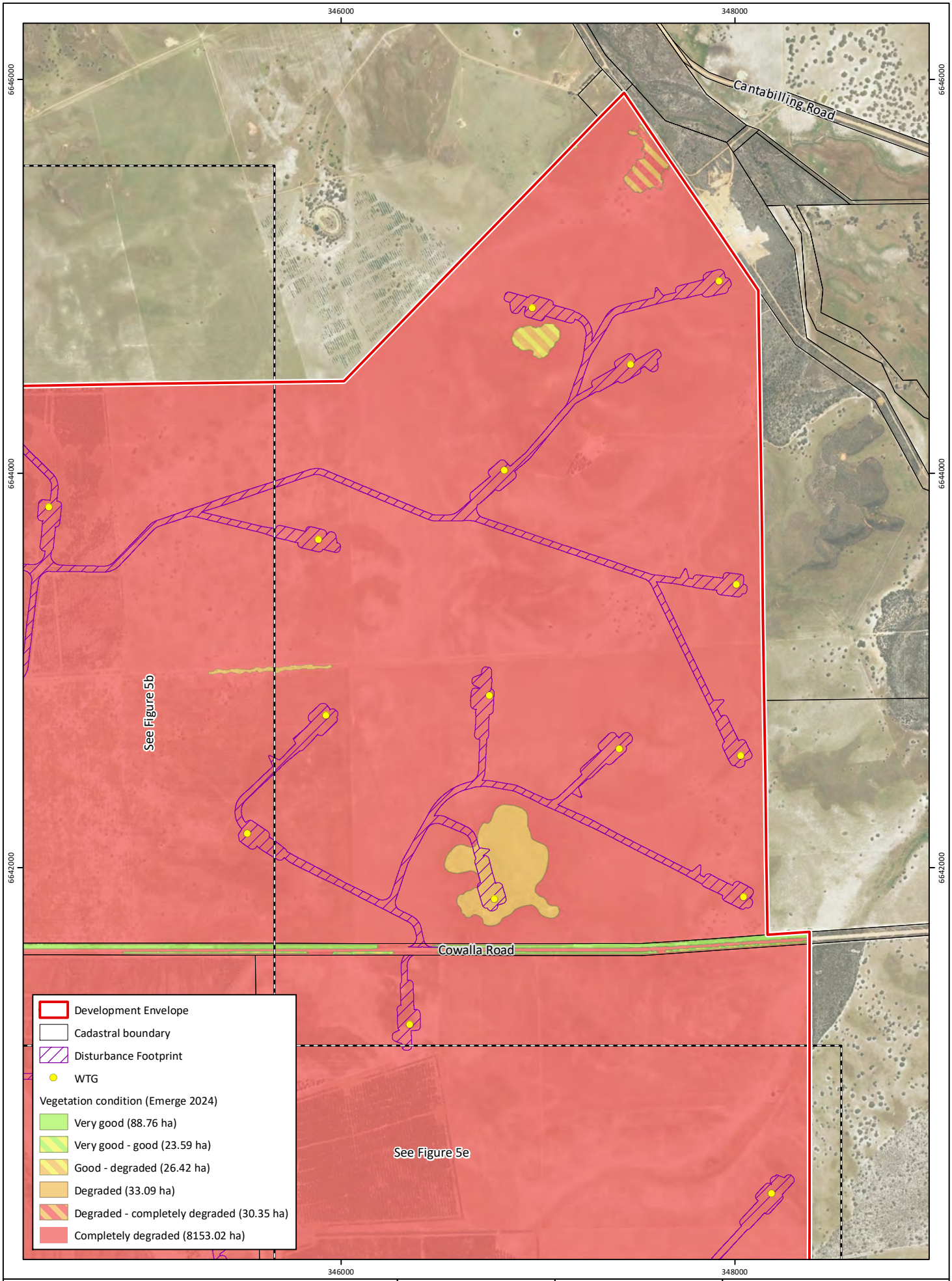


Figure 5c: Vegetation Condition

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F117a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

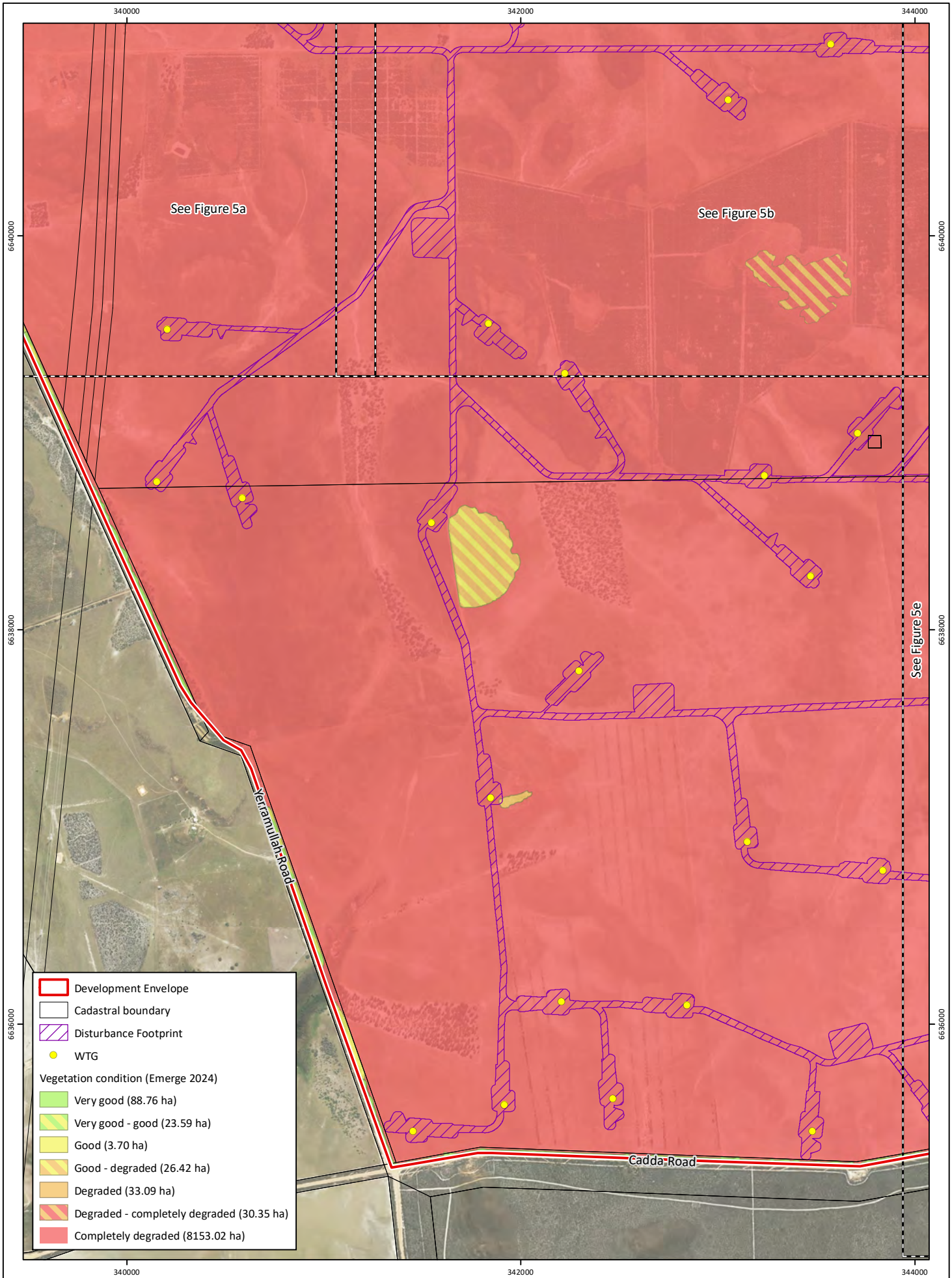


Figure 5d: Vegetation Condition

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F117a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

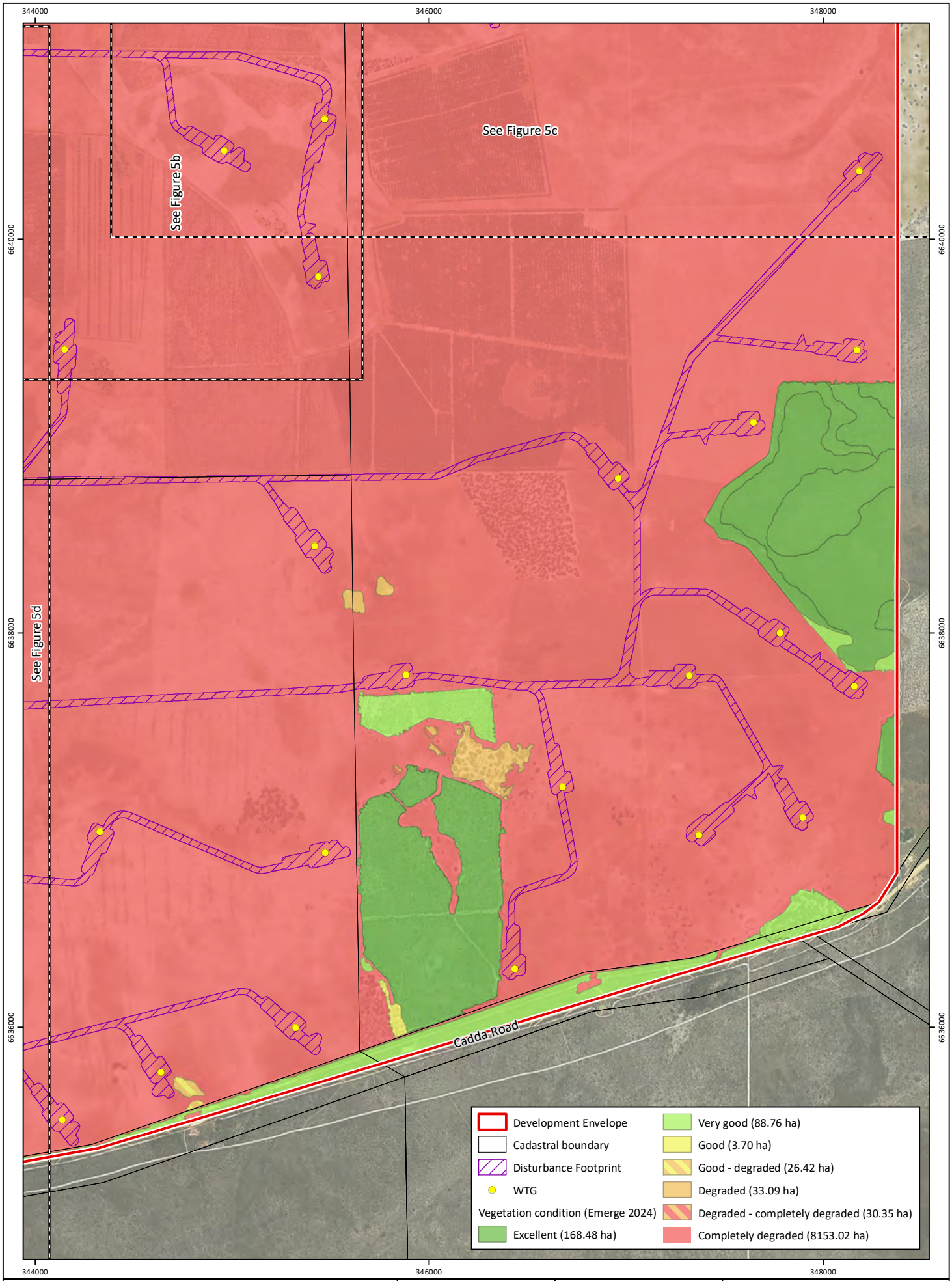


Figure 5e: Vegetation Condition

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number:
EP23-085(12)--F117a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

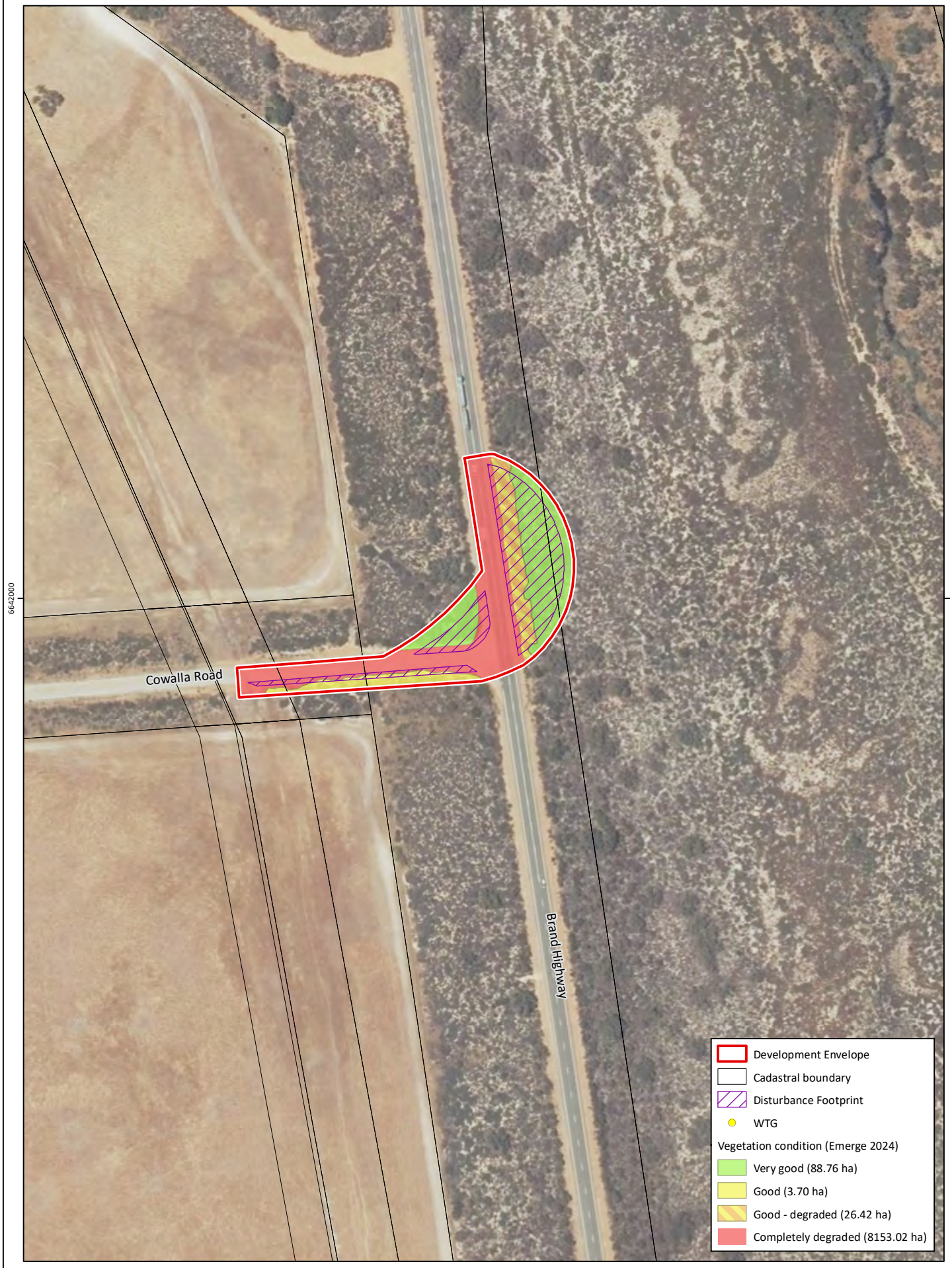


Figure 5f: Vegetation Condition

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number:
EP23-085(12)--F117a
Drawn: WJC
Date: 11/11/2024
Checked: FIK
Approved: JDH
Date: 21/11/2024

N

0 25 50
Metres
Scale: 1:2,500@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

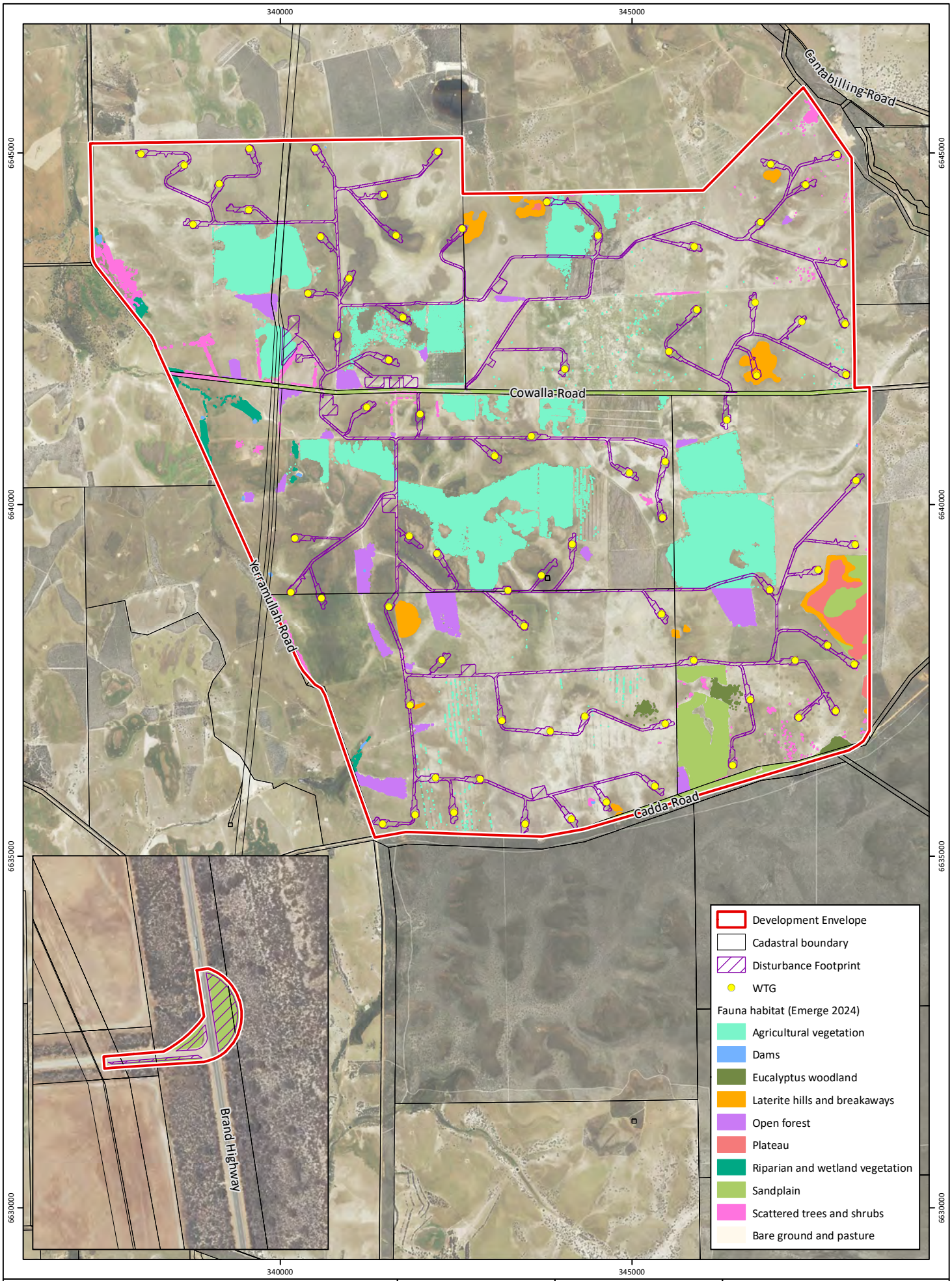


Figure 6: Fauna Habitat

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number:
EP23-085(12)--F118

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 1 2
Kilometers

Scale: 1:70,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

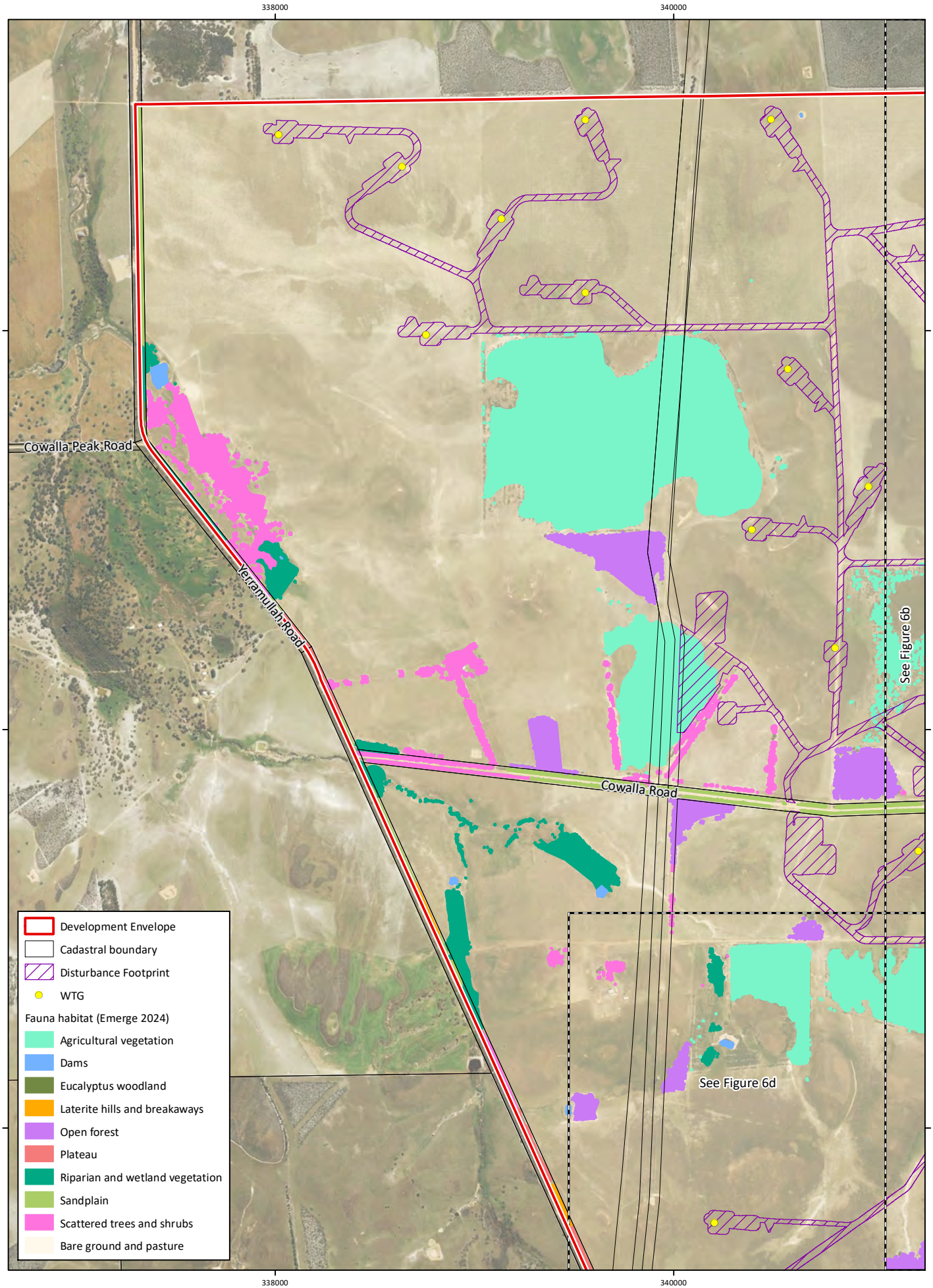


Figure 6a: Fauna Habitat

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F118a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

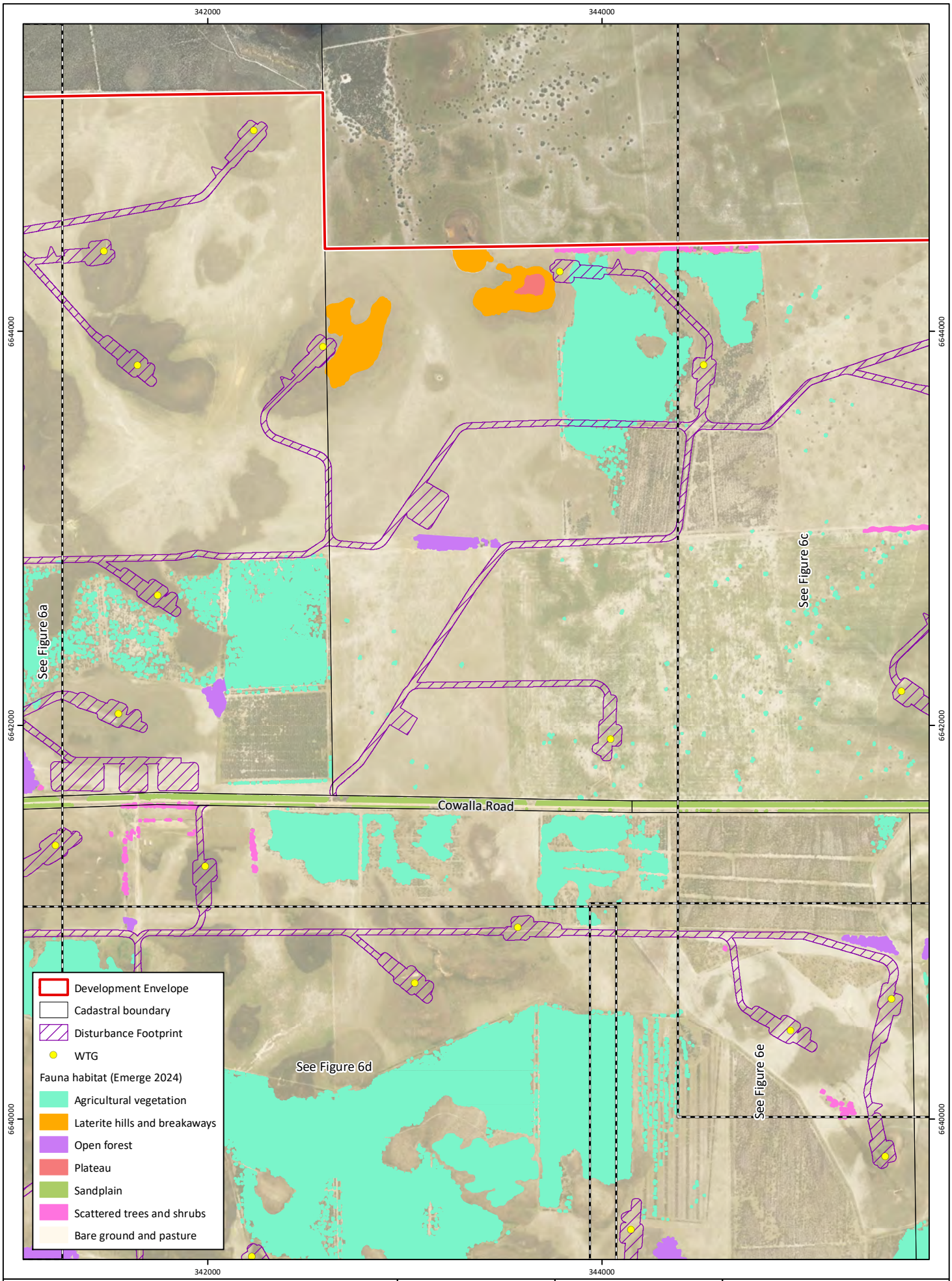


Figure 6b: Fauna Habitat

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number: EP23-085(12)--F118a
Drawn: WJC
Date: 11/11/2024
Checked: FIK
Approved: JDH
Date: 21/11/2024

N

0 250 500
Metres
Scale: 1:25,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

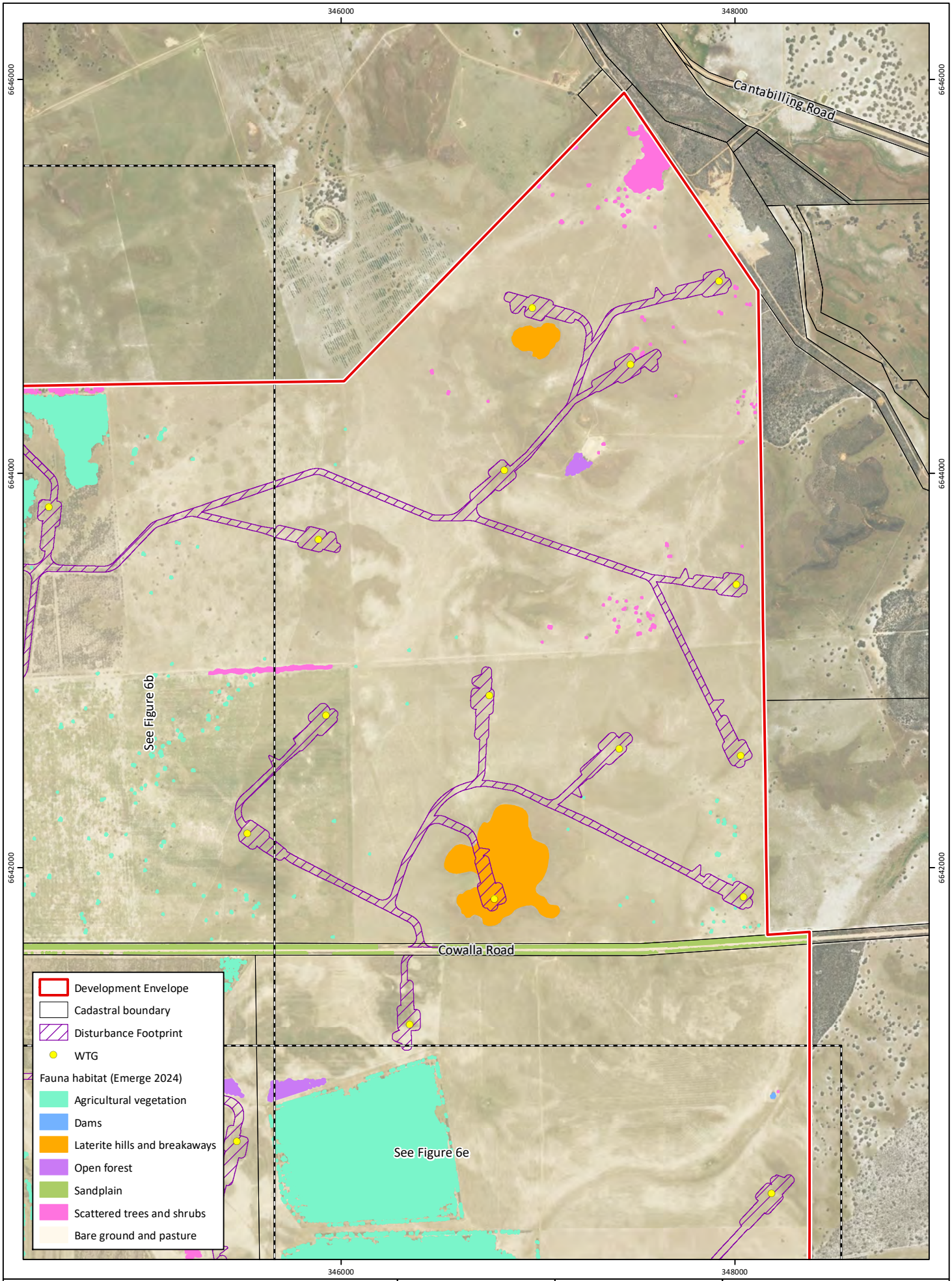


Figure 6c: Fauna Habitat

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F118a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

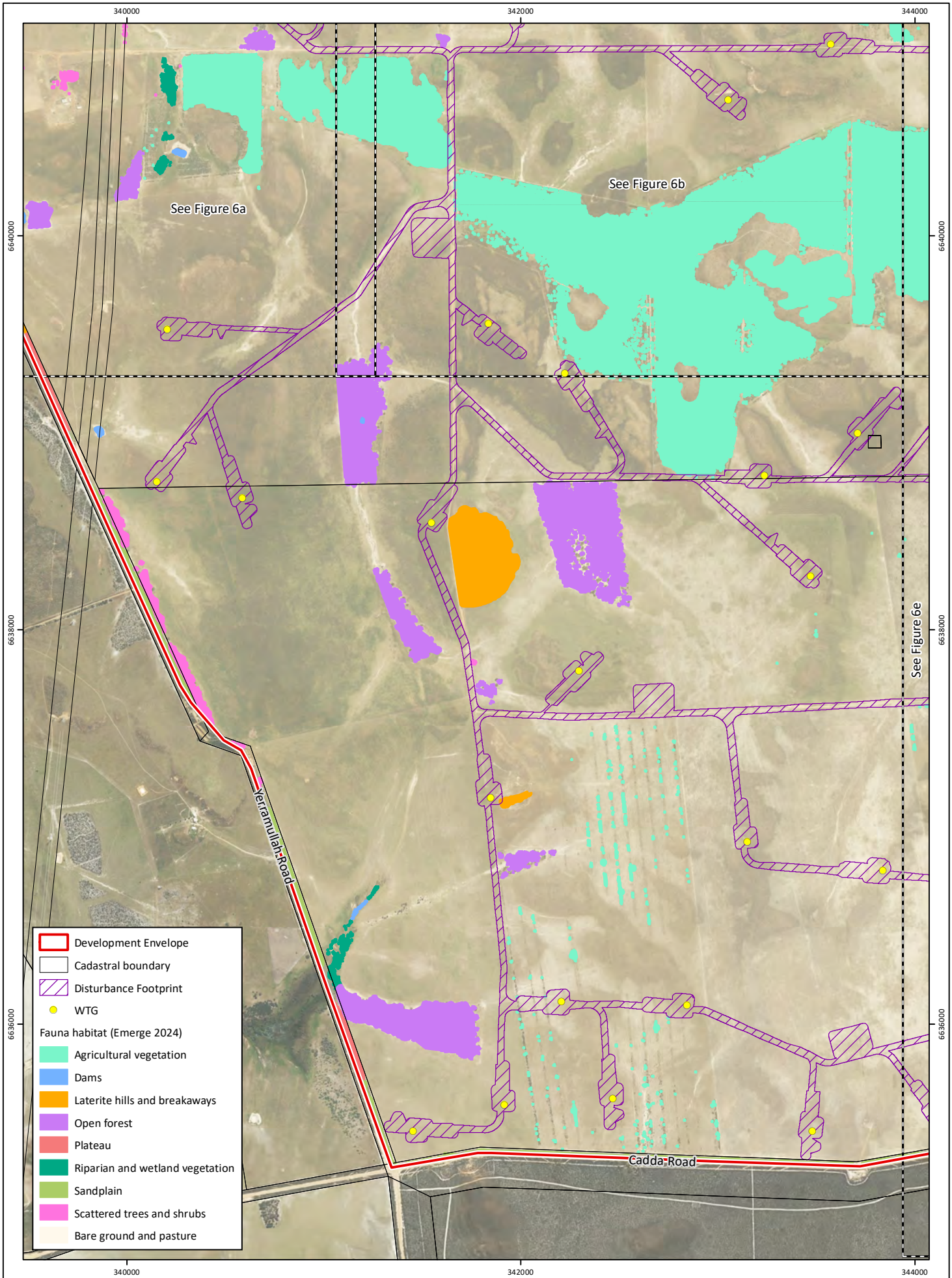


Figure 6d: Fauna Habitat

Project:	EP Act Referral Parron Wind Farm
Client:	Zephyr Energy

Plan Number:
EP23-085(12)--F118a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

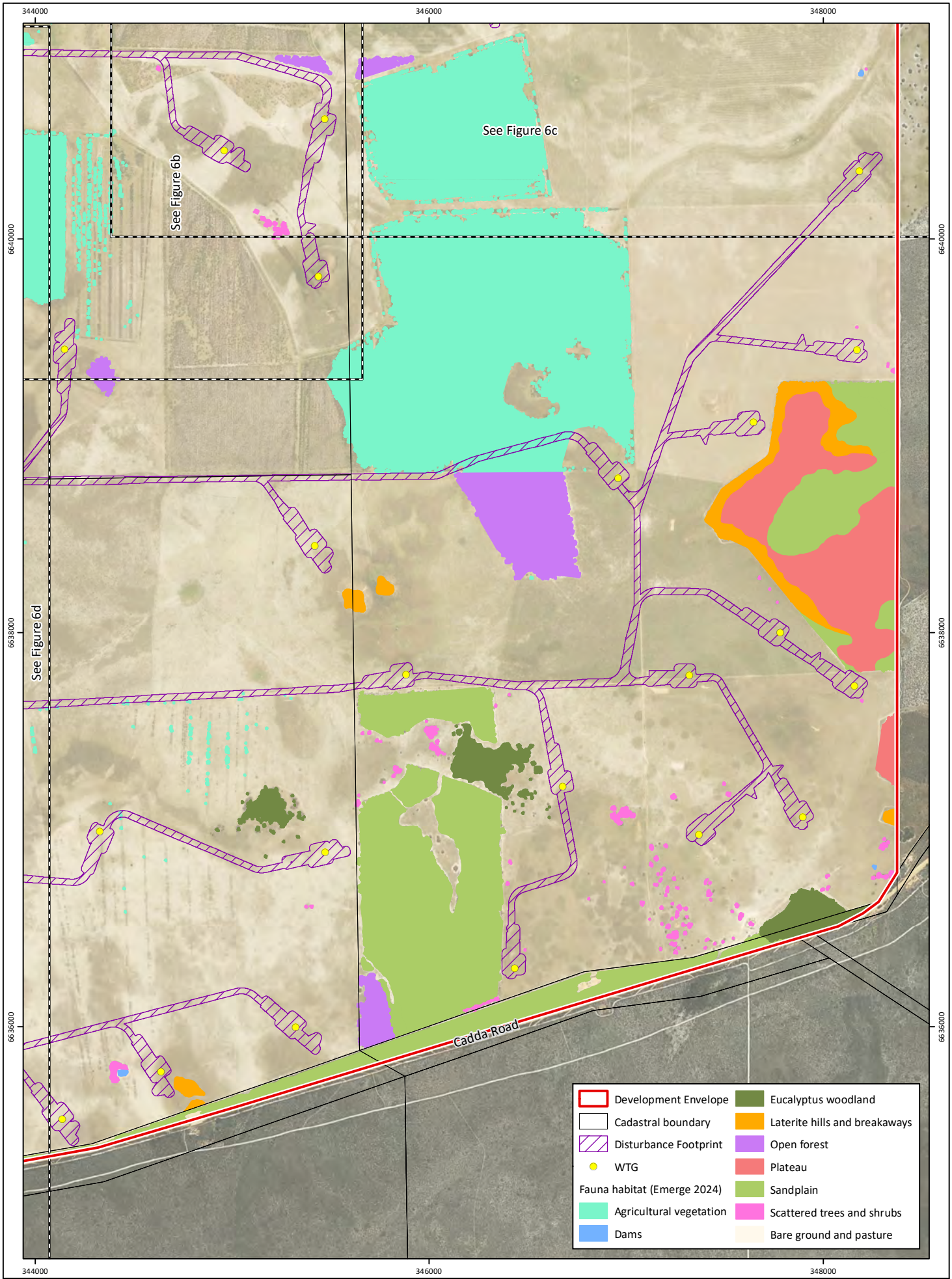


Figure 6e: Fauna Habitat

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number:
EP23-085(12)--F118a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

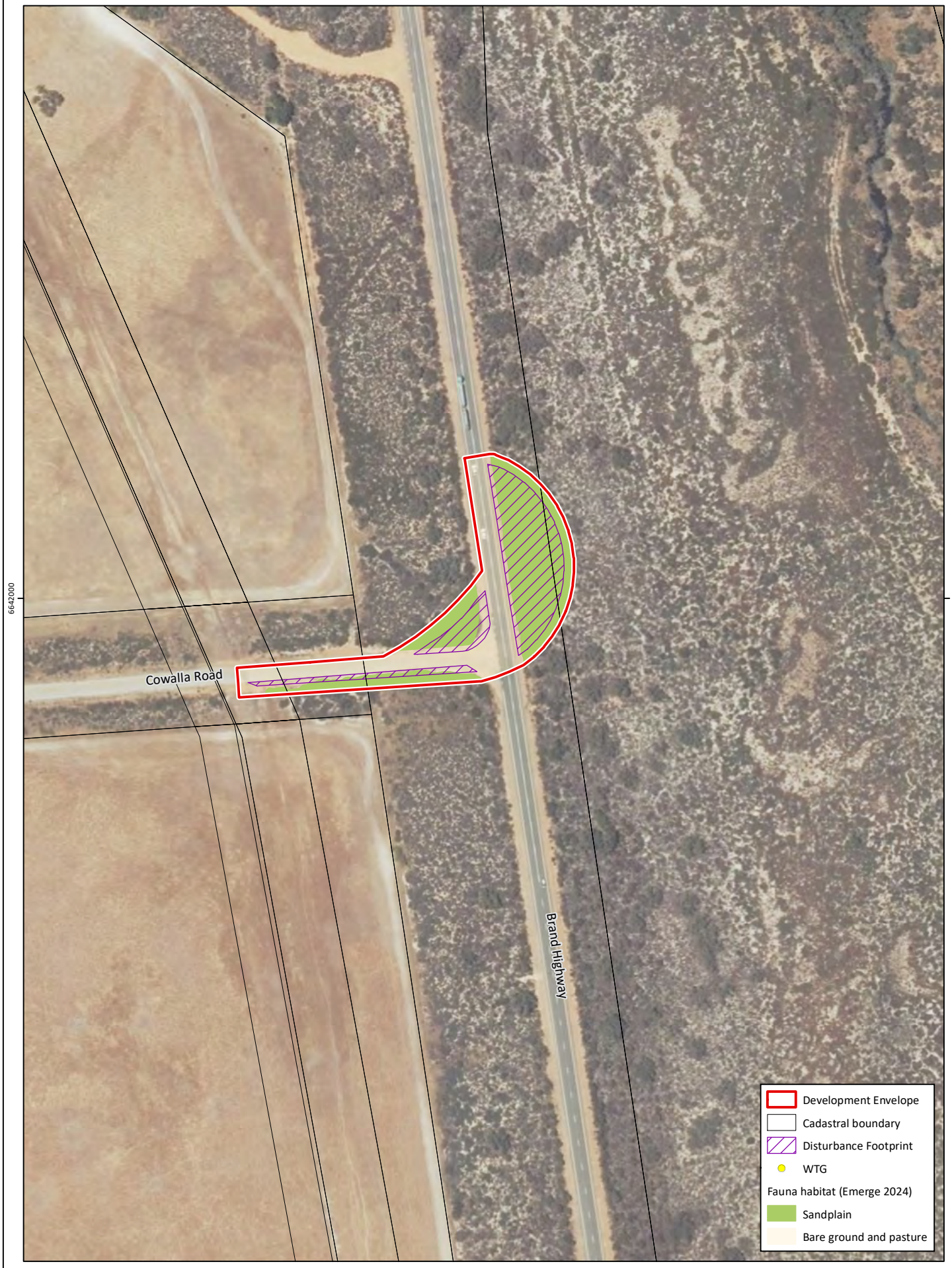


Figure 6f: Fauna Habitat

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number:
EP23-085(12)--F118a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 25 50
Metres

Scale: 1:2,500@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

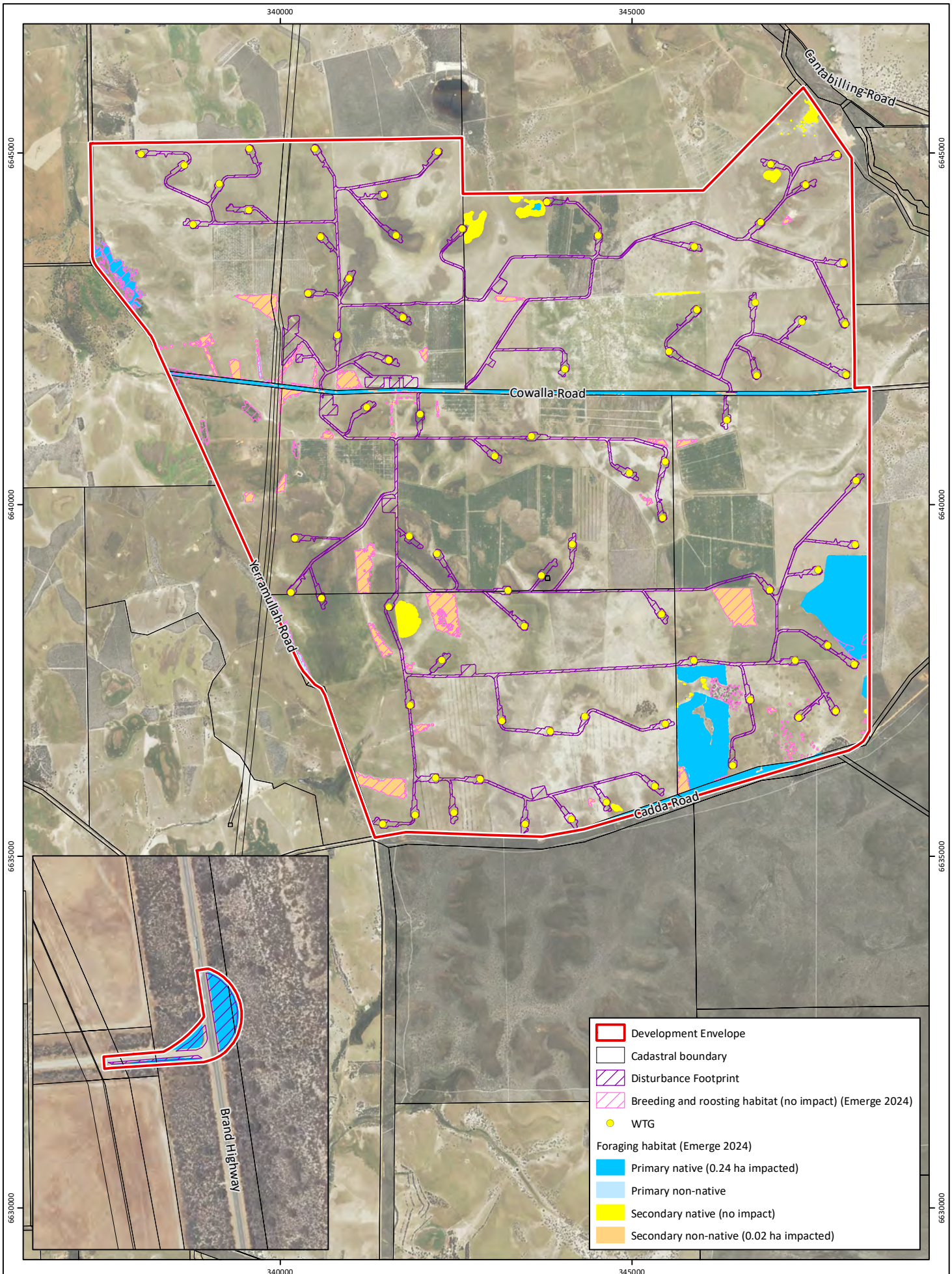


Figure 7: **Carnaby's Black Cockatoo Foraging, Breeding, and Roosting Habitat**

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F119

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 1 2
Kilometers

Scale: 1:70,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

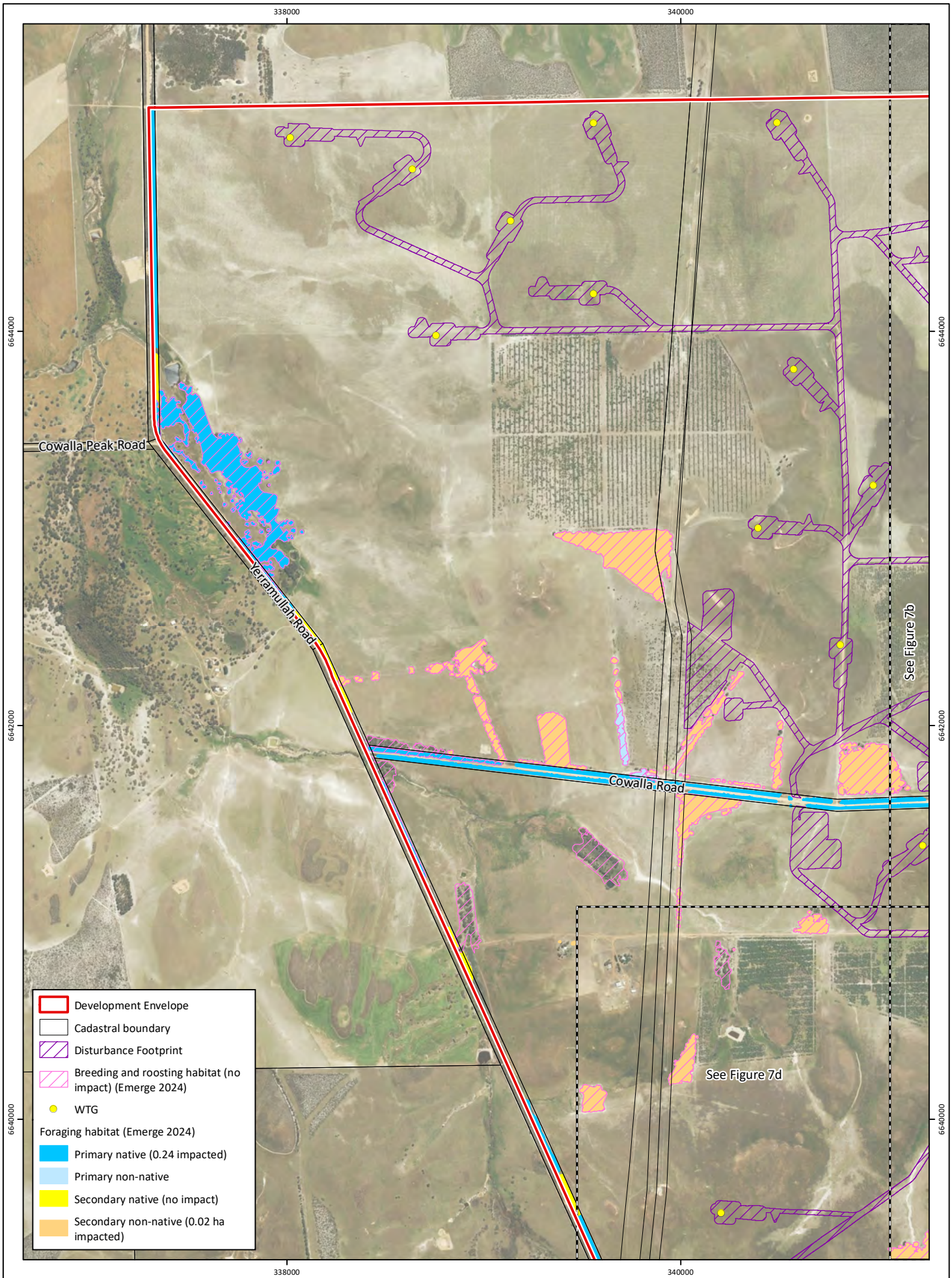


Figure 7a: Carnaby's Black Cockatoo Foraging, Breeding, and Roosting Habitat

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F119a
Drawn: WJC
Date: 11/11/2024
Checked: FIK
Approved: JDH
Date: 21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

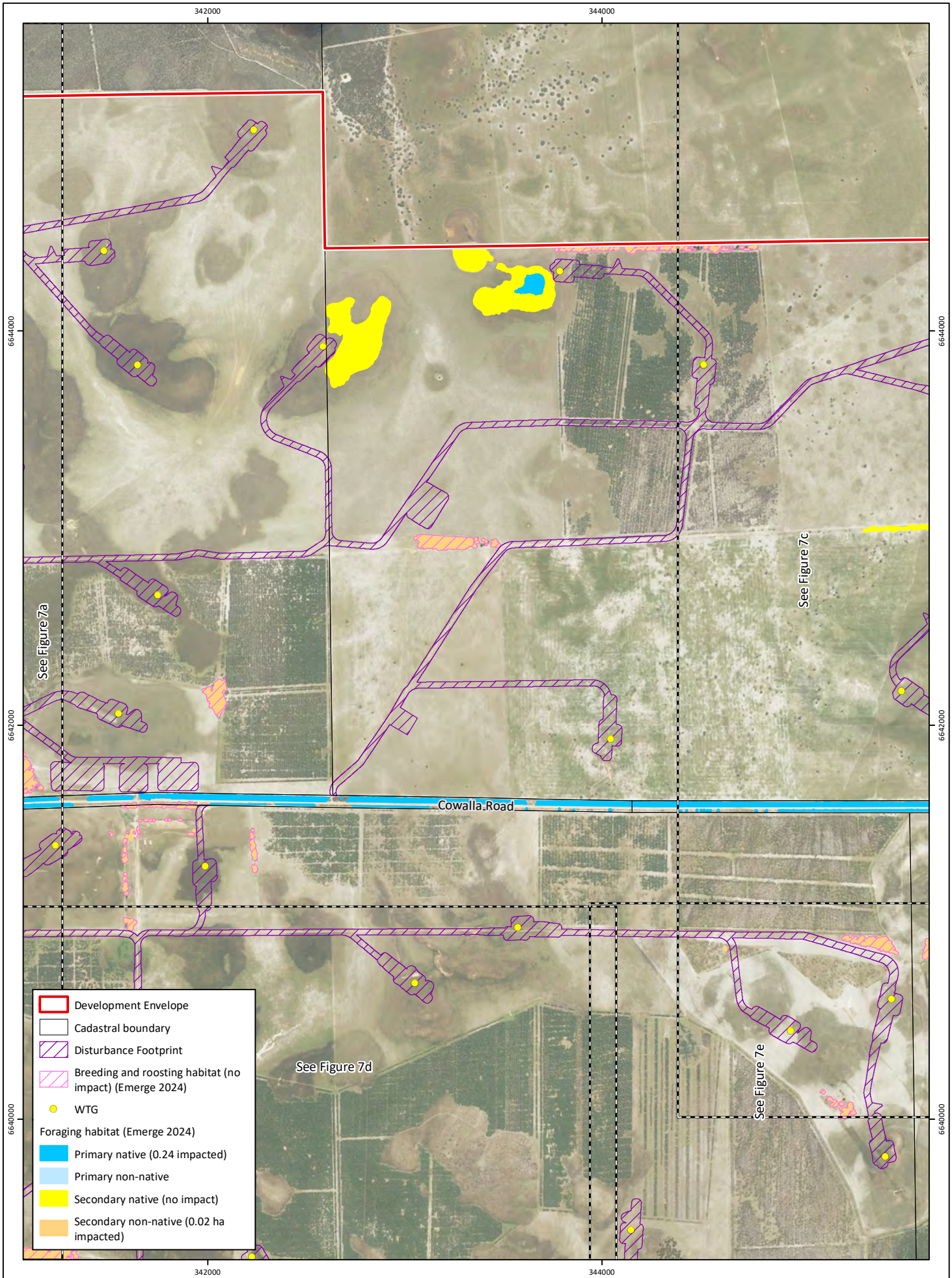


Figure 7b: Carnaby's Black Cockatoo Foraging, Breeding, and Roosting Habitat

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F119a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

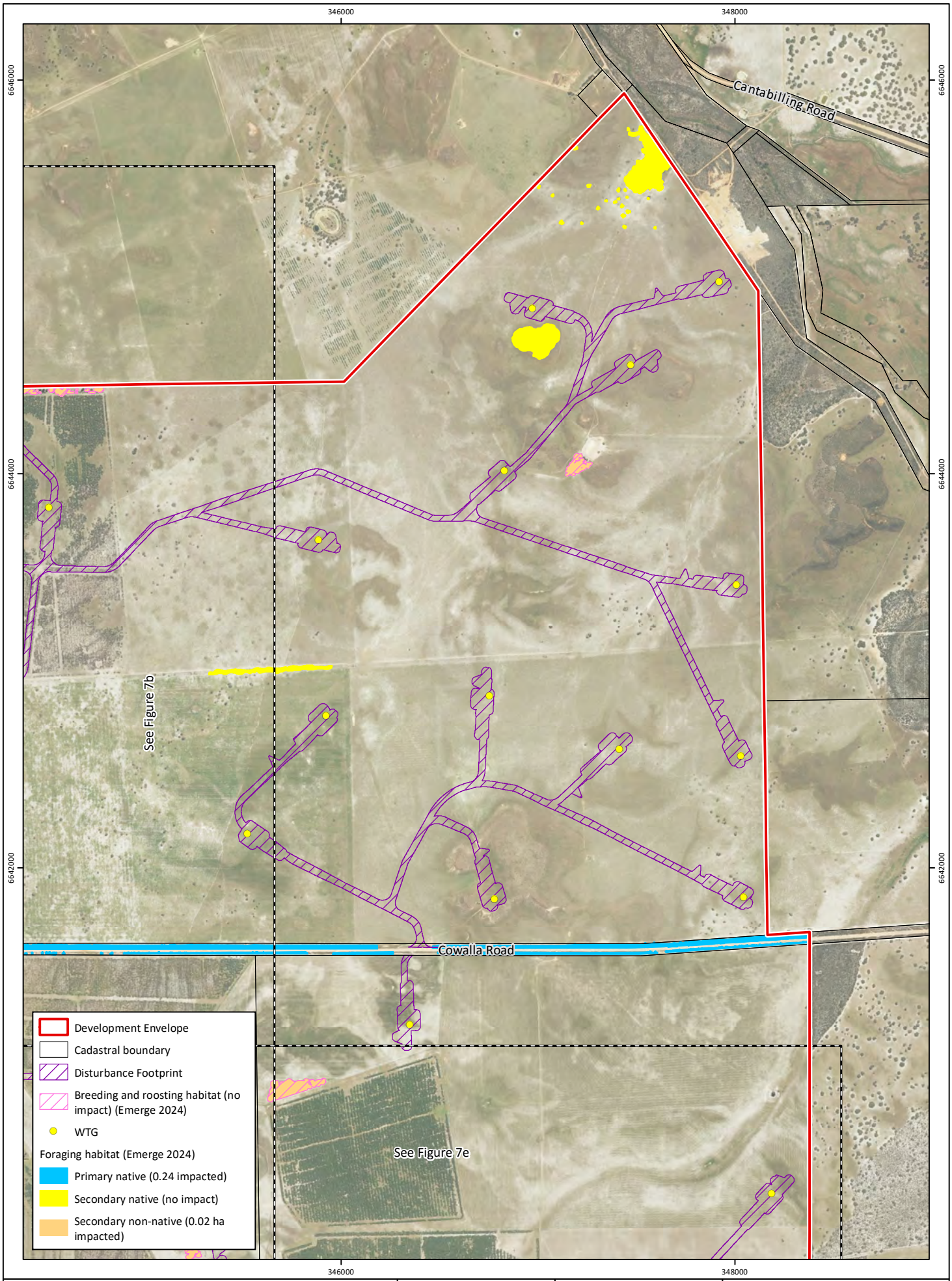


Figure 7c: Carnaby's Black Cockatoo Foraging, Breeding, and Roosting Habitat

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F119a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

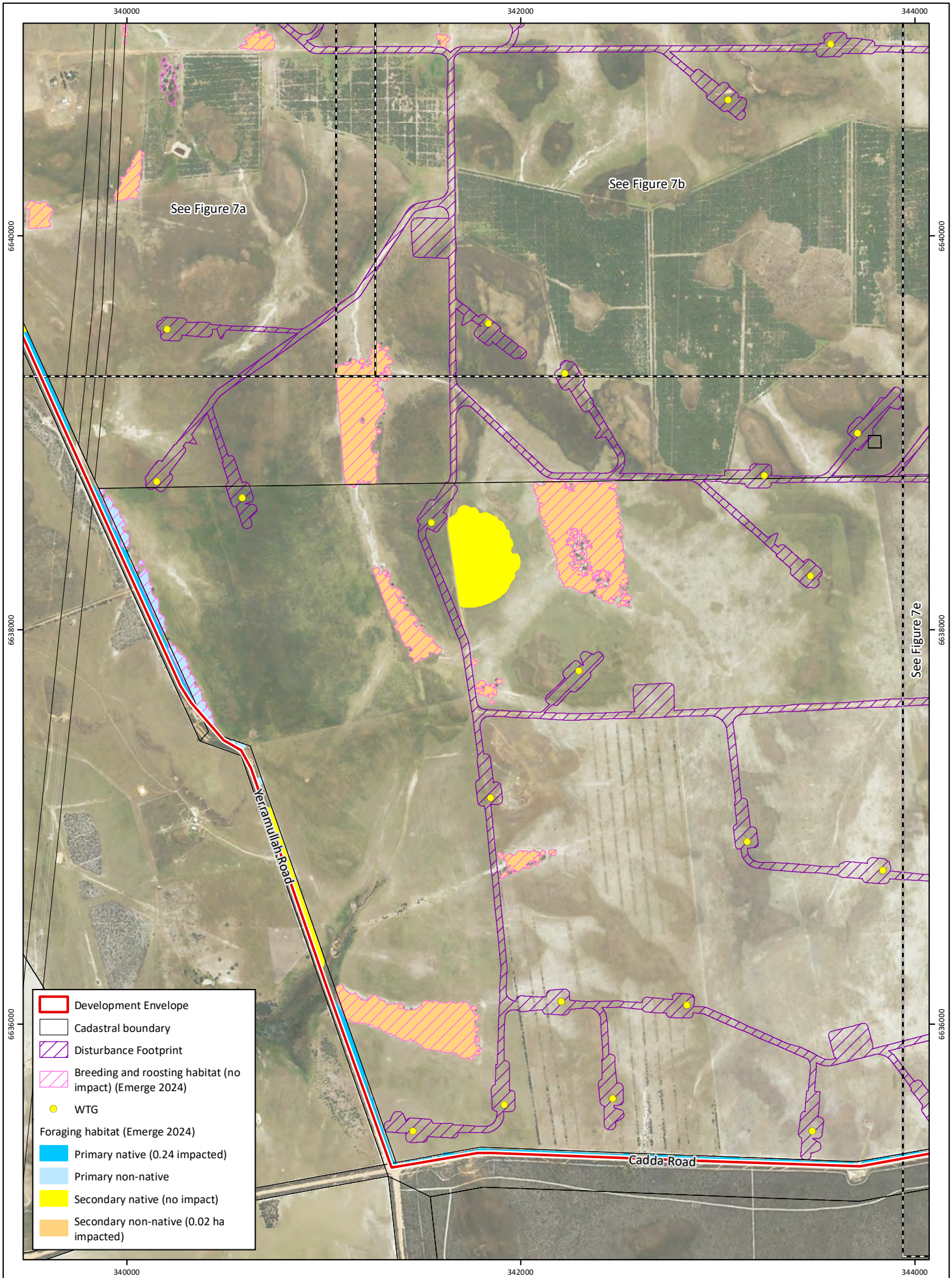


Figure 7d: Carnaby's Black Cockatoo Foraging, Breeding, and Roosting Habitat

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F119a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

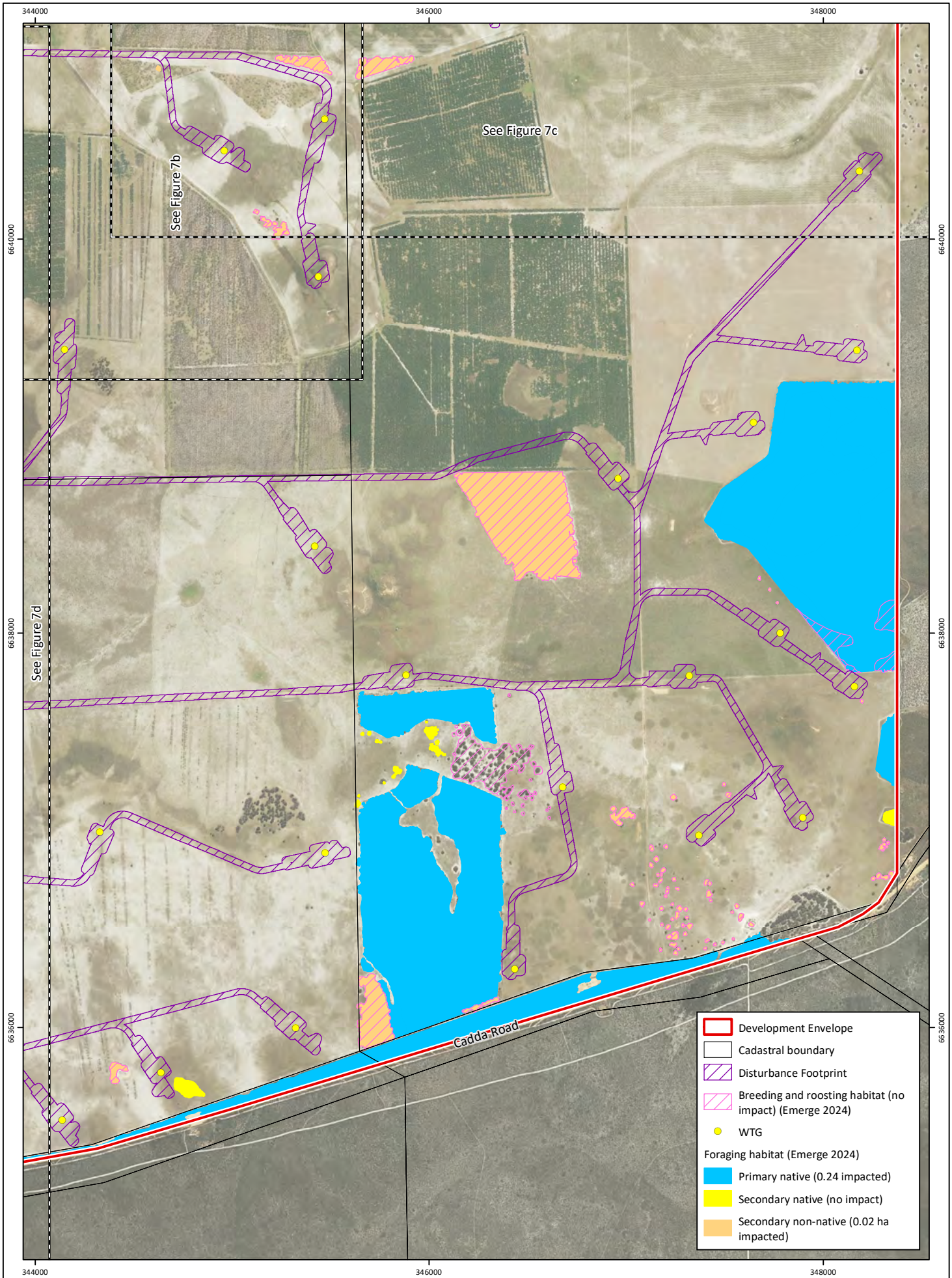


Figure 7e: **Carnaby's Black Cockatoo Foraging, Breeding, and Roosting Habitat**

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F119a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 250 500
Metres

Scale: 1:25,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

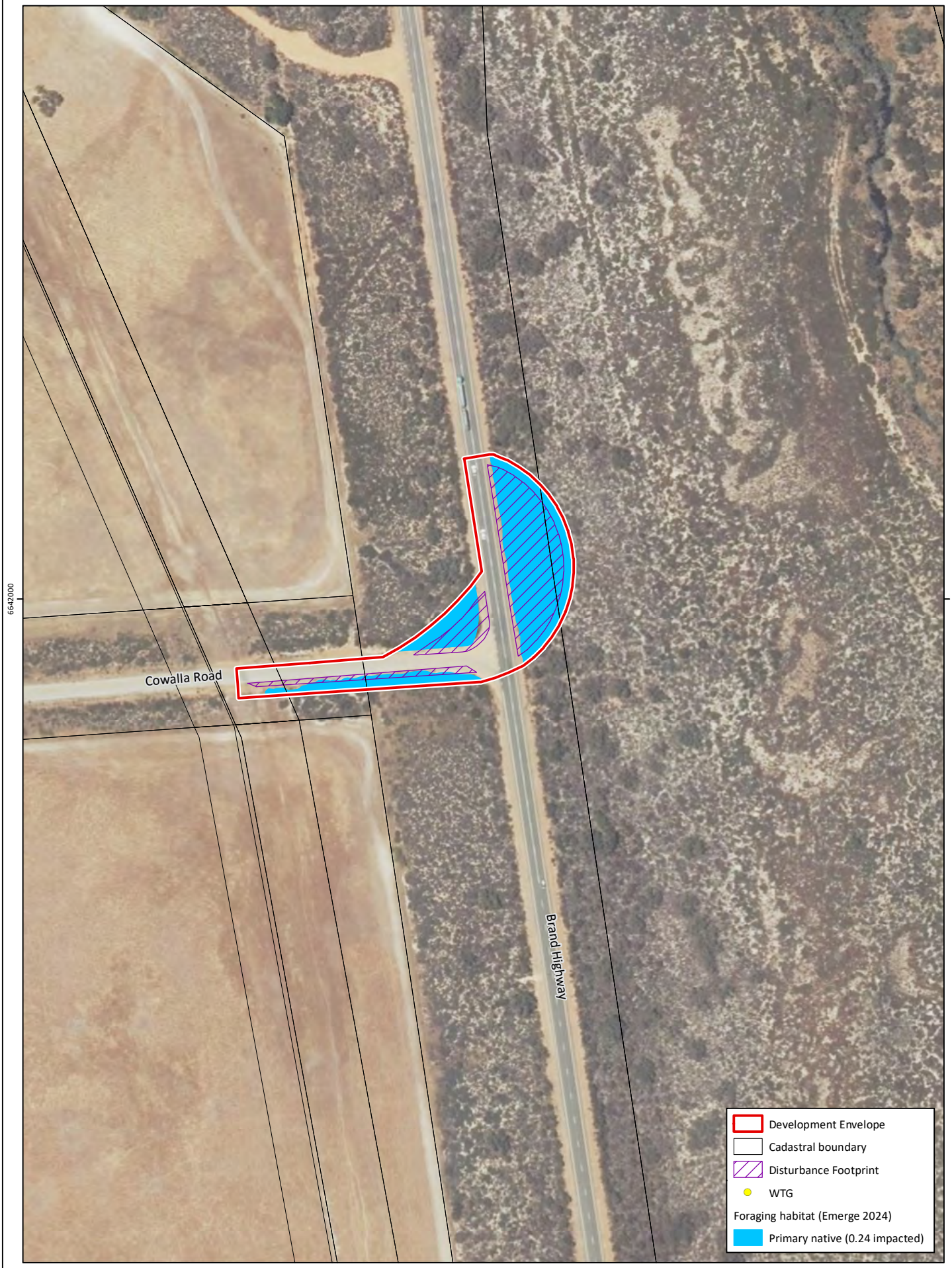


Figure 7f: **Carnaby's Black Cockatoo Foraging, Breeding, and Roosting Habitat**

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number: EP23-085(12)--F119a

Drawn:	WJC
Date:	11/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 25 50
Metres

Scale: 1:2,500@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

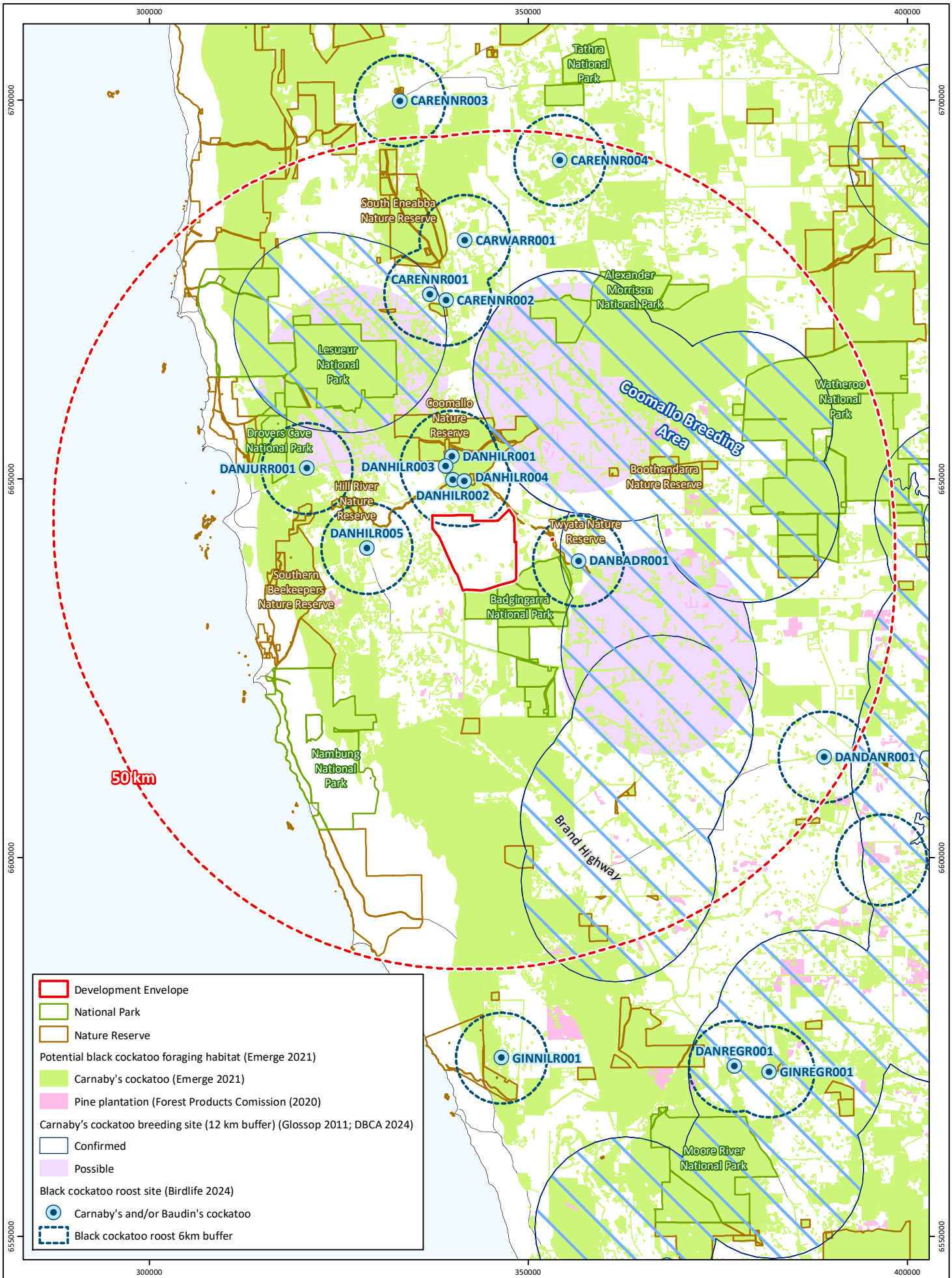


Figure 8: Regional Context

Project: EP Act Referral
Parron Wind Farm
Client: Zephyr Energy

Plan Number: EP23-085(12)--F137
Drawn: WJC
Date: 13/11/2024
Checked: FIK
Approved: JDH
Date: 21/11/2024

N

0 10 20
Kilometers
Scale: 1:650,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

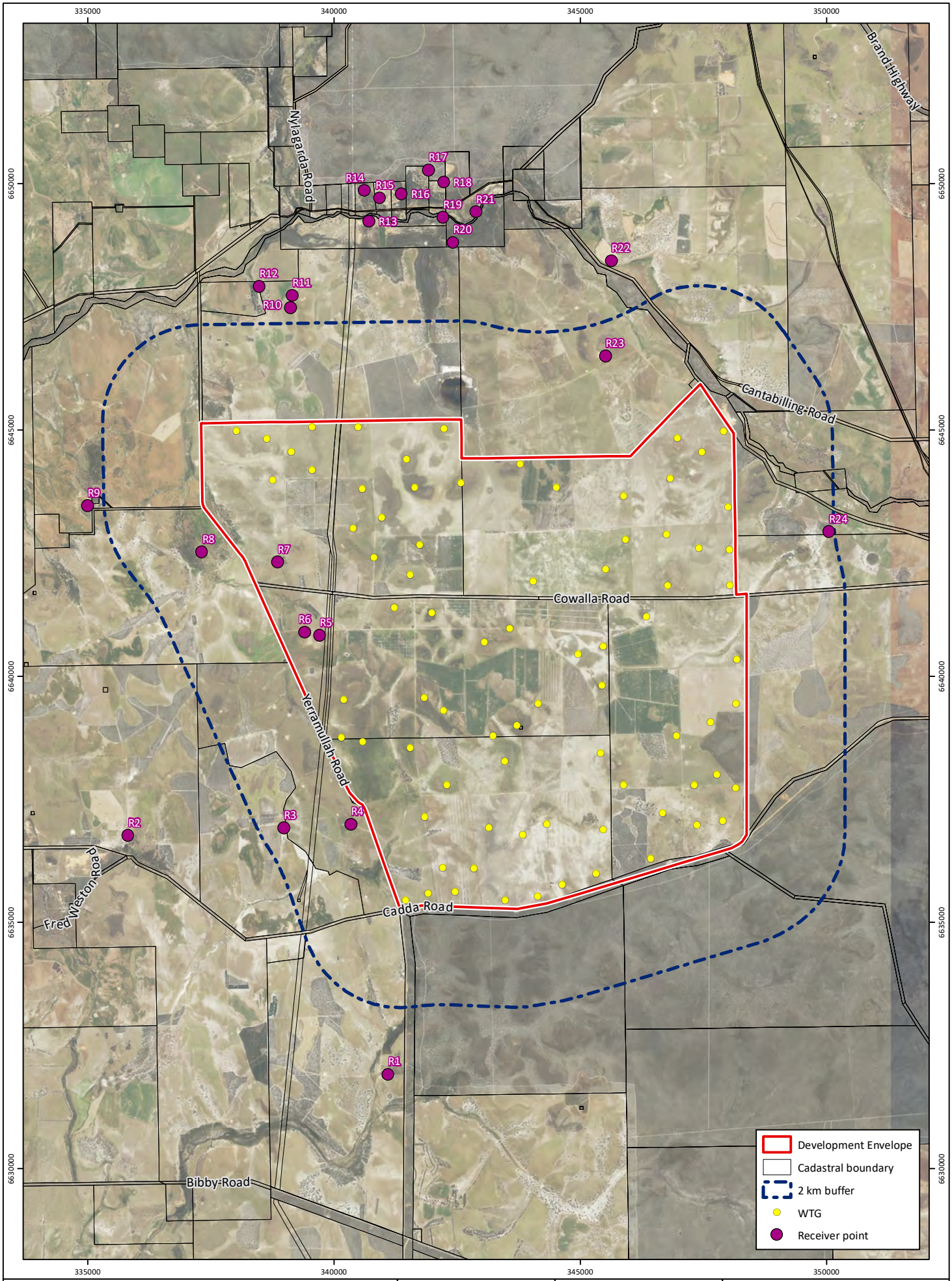


Figure 9: Receiver Point Locations

Project: EP Act Referral
Parron Wind Farm

Client: Zephyr Energy

Plan Number:
EP23-085(12)--F138

Drawn:	WJC
Date:	21/11/2024
Checked:	FIK
Approved:	JDH
Date:	21/11/2024

N

0 1,000 2,000
Metres

Scale: 1:100,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Appendix A

Development Approval

Appendix B

Environmental Assessment and Management Plan

Appendix C

Detailed Flora and Vegetation Assessment

Appendix D

Basic Fauna and Targeted Bird and Bat Assessment

Appendix E

Avifauna Impact Risk Assessment

Appendix F

Conservation Significant Species Likelihood of Occurrence

Appendix G

Noise Impact Assessment

Appendix H

Technical (Review) Report Advice on the Acoustic Assessment

Appendix I

Technical Response to DWER

Appendix J

Landscape and Visual Impact Assessment

Appendix K

Shadow Flicker and Blade Glint Assessment