Visual Impact Assessment

Bonney Downs Wind Farm

Fortescue

87 Adelaide Terrace,
East Perth WA 6004

Prepared by:

SLR Consulting Australia

SLR Project No.: 675.072721.00001

13 June 2025

Revision: 3.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
0.1	20 November 2024	J. Mell / E. Boyd	F. Jones	F. Jones
1.0	20 November 2024	J. Mell / E. Boyd	F. Jones	F. Jones
2.0	30 May 2025	J. Mell/ E. Hay	F. Jones	F. Jones
3.0	13 June 2025	E. Hay	F. Bell	F. Bell

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Fortescue (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

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Executive Summary

SLR Consulting was commissioned by Fortescue to conduct a Visual Impact Assessment (VIA) for 13 points of interest (POIs) around the proposed Bonney Downs Wind Farm (the Project), a proposed staged large-scale wind farm and transmission infrastructure project. The Project is located approximately 130 km north of Newman in the Pilbara Region of Western Australia within the Palyku and Nyiyaparli Native Title Determination areas.

The scope of work involved the characterisation of the existing landscape and the assessment of potential visual amenity and landscape impacts of the Project in relation to existing and potential future impacts.

A site visit was conducted to capture high-resolution photography from valued places and representative Landscape Character Units (LCUs). Photographs captured in August 2024 were used to confirm LCU mapping, as well as providing the basis for photomontage analysis, using a scaled 3D model of the Project.

Potential visual impacts to five LCUs and 13 POIs were assessed. The 13 POIs were further assessed to describe the existing landscape and predicted landscape. Initially, twenty viewpoints were selected for assessment and visited during the field survey, however, these were refined to thirteen viewpoints for the final assessment.

Overall, implementation of the Project was predicted to have a Minor to Moderate-high visual impact due to visibility at 12 of the 13 POIs as a result of the quantity of turbines, the height of the turbines, typically low-lying vegetation and low undulating topography surrounding the Project. One POI (VIA_M) is expected to have no impact, and two POIs (VIA_B and VIA_G) are expected to have a Moderate-high impact. The Project is considered likely to meet the project-specific VMOs due to the following:

- The Project does not result in a dominant change in view for the POI that are located > 1 km from the Project, nor for POI < 1 km from the Project.
- The Project does not result in the removal of valued characteristics, such as major waterways or isolated rounded hills. Nor does it result in significant alteration or disruption to views of these.
- Turbines are visually apparent within the visual catchment area and in some views are a major element however the natural landscape remains the dominant characteristic.

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Glossary

Foreground, Mid-Ground, Background Elements	Different visual layers of a landscape. The foreground refers to the area closest to the viewer, mid-ground is the middle distance, and the background includes distant features
Landscape Character Unit (LCU)	Distinct areas within a landscape that have consistent physical, aesthetic, and socio-cultural characteristics.
Modified Elements	Human-made changes to the natural landscape, such as mining operations, roads, or infrastructure.
Naturalness	A landscape characteristic referring to the extent to which an area remains in its original, undisturbed state, free from human alterations. Higher degrees of naturalness are often associated with valued landscapes that exhibit minimal human alterations, such as unmodified vegetation, landforms, and ecosystems
Photomontage	A composite image that blends photographs of a real landscape with visual representations of proposed developments, used to assess potential visual impacts
Point of Interest (POI)	Specific locations and viewpoints within the study area that are identified for visual impact assessment. These sites were chosen based on use or estimated visibility of the project. POIs are often key viewpoints from which the landscape is experienced, and their sensitivity to changes in visual amenity is evaluated to determine potential impacts from the Project.
Preferred Indicators	Characteristics of natural landscapes that are highly valued for their visual amenity. These include a high degree of ‘naturalness’, variety in landforms and vegetation, the presence of water, distinctive colours, expansive landforms (such as deserts, beaches, and rolling hills), and other distinctive landscape features.
Screening	Natural or artificial features like vegetation, landforms, or structures that block or reduce visibility of certain elements, such as a project or development, from specific viewpoints
Viewer Motion	Describes the speed at which an observer is moving (e.g., walking, driving), which affects how long they are exposed to certain views and how they perceive changes in the landscape
Viewshed Analysis	A technique used to identify the areas that are visible from a specific location, often employing 3D models and topographic data to predict how a development might be seen from different points
Visual Catchment	The area within which a project can be seen at eye level above ground. Its extent will usually be defined by a combination of landform, vegetation and built elements.

1.0 Introduction

Fortescue Ltd (Fortescue) is proposing to develop the Bonney Downs Wind Farm (the Project), a proposed staged large-scale wind farm and transmission infrastructure project. The proposed Project will provide power to the Pilbara Transmission Infrastructure to generate renewable energy to power Fortescue's mining operations. The Project will consist of approximately 200 wind turbines, two substations and associated transmission infrastructure, battery energy storage systems (BESS) and associated supporting infrastructure and a series of access roads and corridors from electrical and transmission cabling.

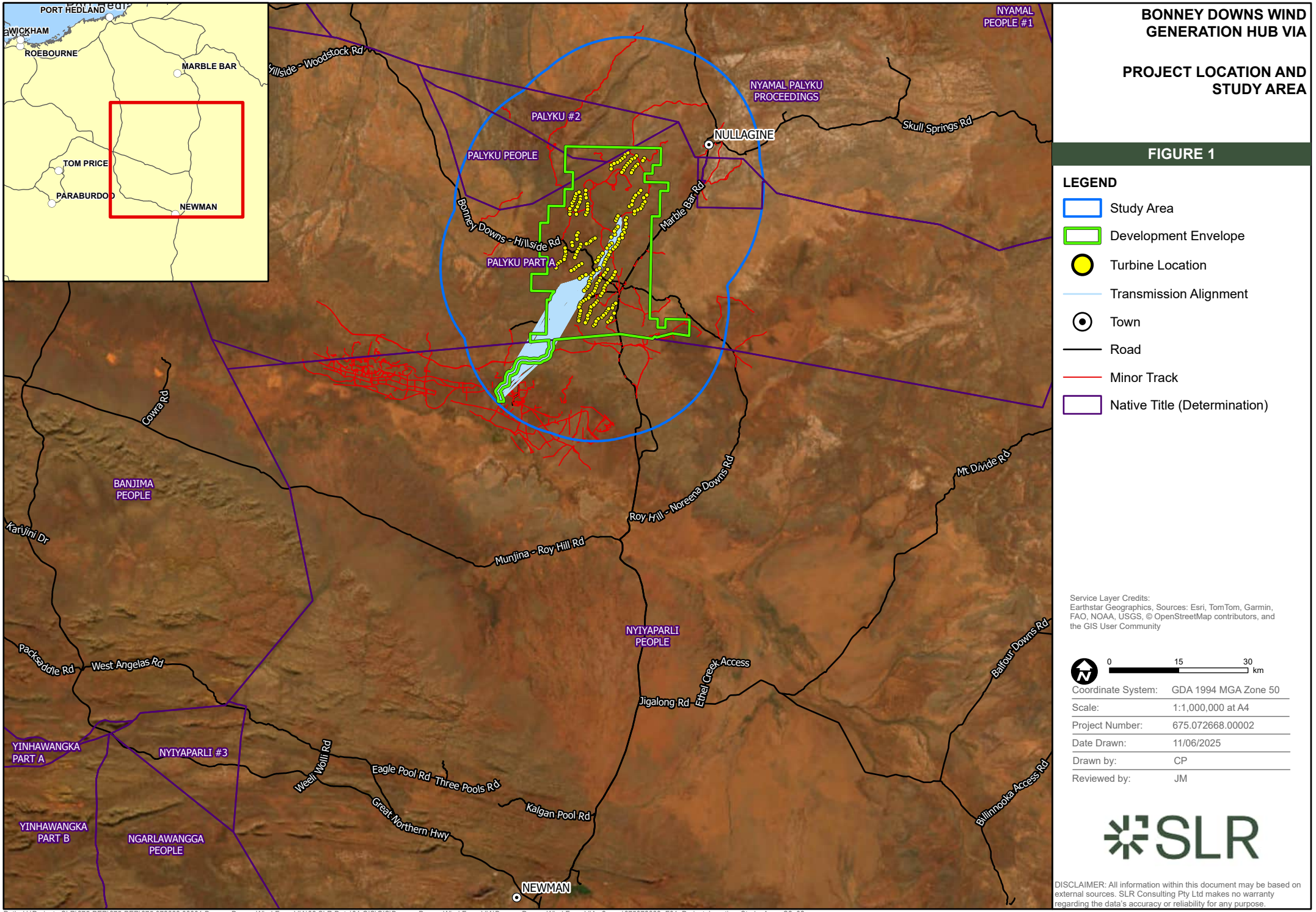
The Project is located approximately 130 km north of Newman in the Pilbara Region of Western Australia (Figure 1) within the Palyku and Nyiyaparli Native Title Determination areas. SLR Consulting was commissioned by Fortescue to conduct a Visual Impact Assessment (VIA) for 13 points of interest (POI) around the proposed Project (Figure 2). Initially, twenty viewpoints were selected for assessment and visited during the field survey, however, these were refined to thirteen viewpoints for the final assessment.

1.1 Project Description

The Project involves the installation of 200 wind turbines, each with a capacity of 7.6 MW. Each turbine will have a 200 x 200 m pad, located in previously cleared areas where feasible.

A 220 kV transmission line will connect the Project to Christmas Creek Mine, following the existing Nullagine Mine Haul Road. Pads of 20 x 30 m at ~300-400 m intervals will be required along the transmission line route to accommodate the transmission poles, and a pads of 100 x 100 m will be required for substations.

Typically, access tracks required for construction will be approximately 20 m wide and suitable for two-way traffic and transportation of turbine components, including allowances for batters, shoulders and drains. During operation, this width will be reduced to 6-10 m. Existing tracks will be used where possible to minimise clearing. Other associated activities include a camp, topsoil stockpiles, electrical and communications reticulation, turkey's nests, concrete batch plant, borrow pits and general project laydowns.



BONNEY DOWNS WIND GENERATION HUB VIA

PROJECT LOCATION AND STUDY AREA

FIGURE 1

LEGEND

- Study Area
- Development Envelope
- Turbine Location
- Transmission Alignment
- Town
- Road
- Minor Track
- Native Title (Determination)

Service Layer Credits:
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Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:1,000,000 at A4
Project Number:	675.072668.00002
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Reviewed by:	JM

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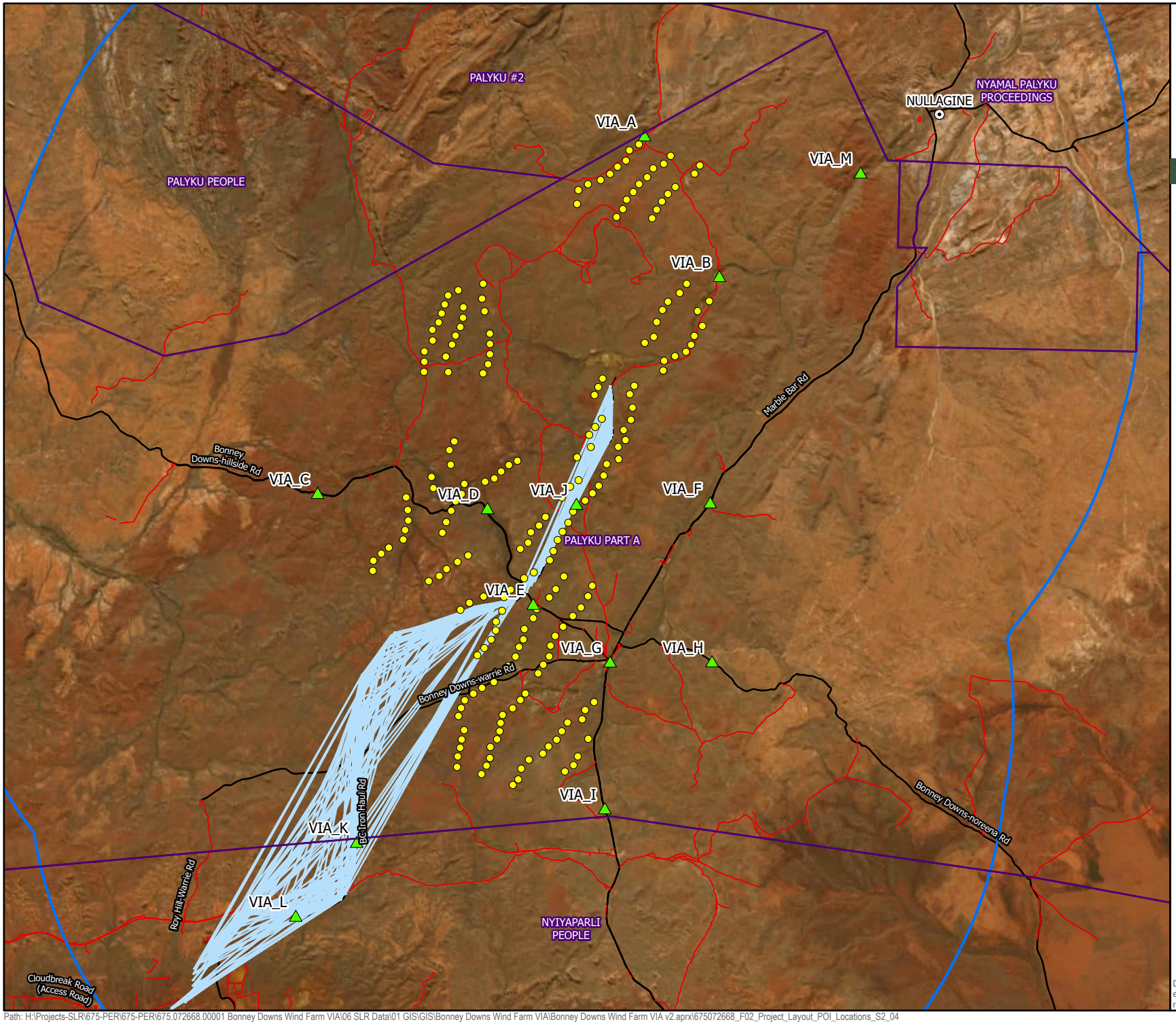

BONNEY DOWNS WIND GENERATION HUB VIA

PROJECT AREA AND POINTS OF INTEREST

FIGURE 2

LEGEND

- Study Area
- Turbine Location
- Transmission Alignment
- POI
- Town
- Road
- Minor Track
- Native Title (Determination)

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1.2 Objectives

1.2.1 Visual Impact Assessment Objectives

The objectives of this VIA are to:

- Determine if Fortescue's activities have any direct or indirect impacts on visual amenities at the thirteen POI.

1.2.2 Visual Management Objectives

The Western Australian Planning Commission's (WAPC) Visual Landscape Planning in Western Australia: A manual for evaluation, assessment, siting, and design (2007) adopts three broad Visual Management Objectives (VMOs):

- Best practice siting and design
- Protection and enhancement
- Restoration of degraded character or enhancement opportunities.

New South Wales Department of Planning and Environment (2016) define visibility distance zones as they relate to view distance and relative visual magnitude, describing view distances of 1 km as the far foreground with the relevant size of the development decreasing in apparent size with view distance. Based on this, the following project-specific VMOs have been adopted:

- The Project should not result in a dominant change in view for moderate to high sensitivity viewpoints that are located > 1 km from the Project Area.
- The Project should not result in a significant modification to the visual catchment, turbines may be visually apparent and become a major element in the landscape but should not dominate the existing visual catchment
- Minimise the impact of the Project that results in the removal or visual alteration/disruption of key landscape features.

This VIA will help to demonstrate how the Project can meet these project-specific VMOs.

1.3 Legislative and Policy Framework

Legislative instruments exist at both Federal and State levels that directly or indirectly support the protection of landscapes and their associated visual amenity. These are outlined in Table 1.

1.4 Assessment Guidelines and Standards

This report was prepared with reference to the following guidelines and standards:

- Environmental Protection Authority 2018, Environmental Factor Guideline – Landforms (EPA 2018)
- Environmental Protection Authority 2023, Environmental Factor Guideline – Social Surroundings (EPA 2023a)
- Environmental Protection Authority 2023, Statement of Environmental Principles, Factors and Objectives (EPA 2023b)

- Environmental Protection Authority 2023, Technical Guidance – Environmental impact assessment of Social Surroundings – Aboriginal cultural heritage (EPA 2023c)
- Western Australian Planning Commission 2007, Visual Landscape Planning in Western Australia: A manual for evaluation, assessment, siting and design (WAPC 2007)
- Landscape Institute 2013, GLVIA3 – Guidelines for Landscape and Visual Impact Assessment. Third edition (Landscape Institute 2013)

Table 1: Legislative and Policy Framework and Relevance to the Project

Applicable Legislation	Relevance	Consideration Under this Assessment
Federal Law		
Environment Protection and Biodiversity Conservation Act 1999	Under Section 528 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the term 'environment' is defined as: a. Ecosystems and their constituent parts, including people and communities b. Natural and physical resources c. The qualities and characteristics of locations, places and areas d. Heritage values of places e. The social, economic, and cultural aspects of a thing mentioned in (a), (b), (c) or (d). While the Project has the potential to affect all aspects of the 'environment' as defined under the EPBC Act, impacts to (c) and (d) are directly related to landscape and visual amenity values.	This assessment has been prepared using a methodology that assesses and documents the qualities, characteristics, and social importance of the receiving environment, and presents an estimated level of impact using a combination of professional judgement and analytical methods.
Native Title Act 1993	The *Native Title Act 1993* recognises the traditional 'rights and interests' that certain groups of Aboriginal or Torres Strait Islander People have rights and interests to certain areas of land. Native Title can exist alongside the rights of other land holders (e.g., pastoral lessees, *Mining Act 1978* tenure). As Native Title is a legal recognition of traditional lands, it is important that the needs of Determinants are considered when assessing visual and landscape impact.	The Project is located within two native title determination areas, Palyku (WCD2019/002) and Nyiyaparli (WCD2018/008).
State Law		
Environmental Protection Act 1986 (EP Act)	Section 3(1) of the EP Act defines 'environment' as: Environment, subject to subsection (2), means living things, their physical, biological, and social surroundings, and interactions between all of these. Section 3(2) of the Act goes on to state:	Under the Landforms factor, the EPA considers possible impacts such as the removal or alteration of the landform's defining geology, morphology or abiotic processes and the level of dependent environmental values (EPA 2018).

Applicable Legislation	Relevance	Consideration Under this Assessment
	In the case of humans, the reference to social surroundings in the definition of environment in subsection (1) is a reference to aesthetic, cultural, economic, and other social surroundings to the extent to which they directly affect or are affected by physical or biological surroundings. When a proposal is assessed under the EP Act, the EPA may consider a proposal's impacts to visual amenity under its guidance framework for environmental factors based on a number of environmental factors and protection objectives listed in the Statement of Environmental Principles, Factors and Objectives (EPA 2023b). The factors and objectives generally relevant to landscape and visual impacts are: • Landforms: "To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected" (EPA 2018) • Social Surroundings: "To protect social surroundings from significant harm" (EPA 2023a) The EPA's consideration of impacts to Landforms is distinctly separate from impacts to Social Surroundings. Where a landform and associated landscape may hold socio-cultural significance, assessment of potential impacts falls under the Social Surroundings factor. Typically, the significance of landforms is valued based on their variety, integrity, ecological importance, scientific importance, and rarity (EPA 2018). This VIA does not assess impacts to ecological function as these are assessed by other technical disciplines.	Similarly, under the Social Surroundings Factor, the EPA will consider activities that may impact the amenity of social surroundings or aesthetic values (EPA 2023a). For this assessment, several Points of Interest (POIs) have been identified as potential areas that may be used or visited by Traditional Owners or other stakeholders, and to which the project may affect the use of these areas.
Aboriginal Heritage Act 1972 (AH Act)	The AH Act provides for the identification and protection of places and objects of traditional importance to Aboriginal People in Western Australia, managing activities that may harm the heritage and promote an appreciation of Aboriginal cultural heritage. The AH Act focuses on direct harm to Aboriginal sites and objects. Visual impacts to social surroundings values are not considered an	Not Applicable. There are a number of Aboriginal Heritage places identified under the AH Act within the Study Area. These have been noted as they provide context however visual amenity is not assessed under the AH Act.

Applicable Legislation	Relevance	Consideration Under this Assessment
	impact under the AH Act unless there is direct disturbance to the place or object occurs.	
Non-Legislative Requirements		
Statement of Planning Policy No. 2: Environment and Natural Resources Policy (2003)	The Western Australian Planning Commission's (WAPC) Statement of Planning Policy No. 2: *Environment and Natural Resource Policy (2003)* states that the objective of the policy is to: • Identify and safeguard landscapes with high geological, geomorphological, or ecological values, as well as those of aesthetic, cultural or historical value to the community, and encourage the restoration of those that are degraded. • Consider the level or capacity of the landscape to absorb new activities and incorporate appropriate planning and building design and siting criteria to ensure that new development is consistent and sensitive to the character and quality of the landscape. Consider the need for a landscape, cultural or visual impact assessment for land use or development proposals that may have a significant impact on sensitive landscapes.	This assessment aims to meet the objectives of the Policy by identifying landscapes with high values and considers their capacity to absorb changes.

2.0 Regional Context

This section considers the social, economic, and environmental context in the areas surrounding the Project. This provides important insight into the overall visual quality and perception of an areas that is, the overall 'View Experience' (WAPC 2007). While the elements that make a landscape are based on environmental and other physical factors, socioeconomics and demographics are largely responsible for how landscapes are experienced.

The selection of an appropriate Study Area was a key component of this assessment as it defined the area within which all impacts from the Project were assessed. When defining the Study Area, two key requirements needed to be met:

- Covers the entirety of the area of the Project's operations, i.e., the proposed disturbance footprint and proposed infrastructure such as turbines, access tracks and powerline (the 'Project Area')
- Encompasses the 13 Points of Interest (POI) provided by Fortescue.

A radius of 25 km from the POI was selected for this assessment for the following reasons:

- The Project would be seen in the far background of the view and is at the limit of casual visibility (New South Wales Department of Planning and Environment (2016) and Sullivan et. al (2012))
- It contains a variety of Landscape Character Units (LCUs, defined in Section 3.2.2).

The resultant Study Area is 378,007 ha in size covering the area shown in Figure 1.

2.1 Social Surrounds

The Project Area falls entirely within the Local Government Authority (LGA) of the Shire of East Pilbara. This LGA includes the townsites of Nullagine, Marble Bar, Bamboo, Shay Gap, Goldsworthy and several Aboriginal Communities. The mining sector dominates the economic landscape of the LGA.

The Shire of East Pilbara population was 9,760 at the last reported census (ABS 2021).

2.1.1 Local Population

The closest major population centre is Nullagine, which is located within the Study Area. The last reported census recorded a population of 147 with 53.3% being male and 46.5% being female and a median age of 38 years (ABS 2021). Aboriginal and Torres Strait Islander people made up 61.2% of the recorded population (ABS 2021). The Aboriginal population of Nullagine was recorded as 90 in 2021 with 50.5% being male and 49.5% female and a median age of 27 (ABS 2021). Native Title determinations in the Project Area recognise the Palyku and Nyiyaparli people.

2.1.2 Existing Infrastructure

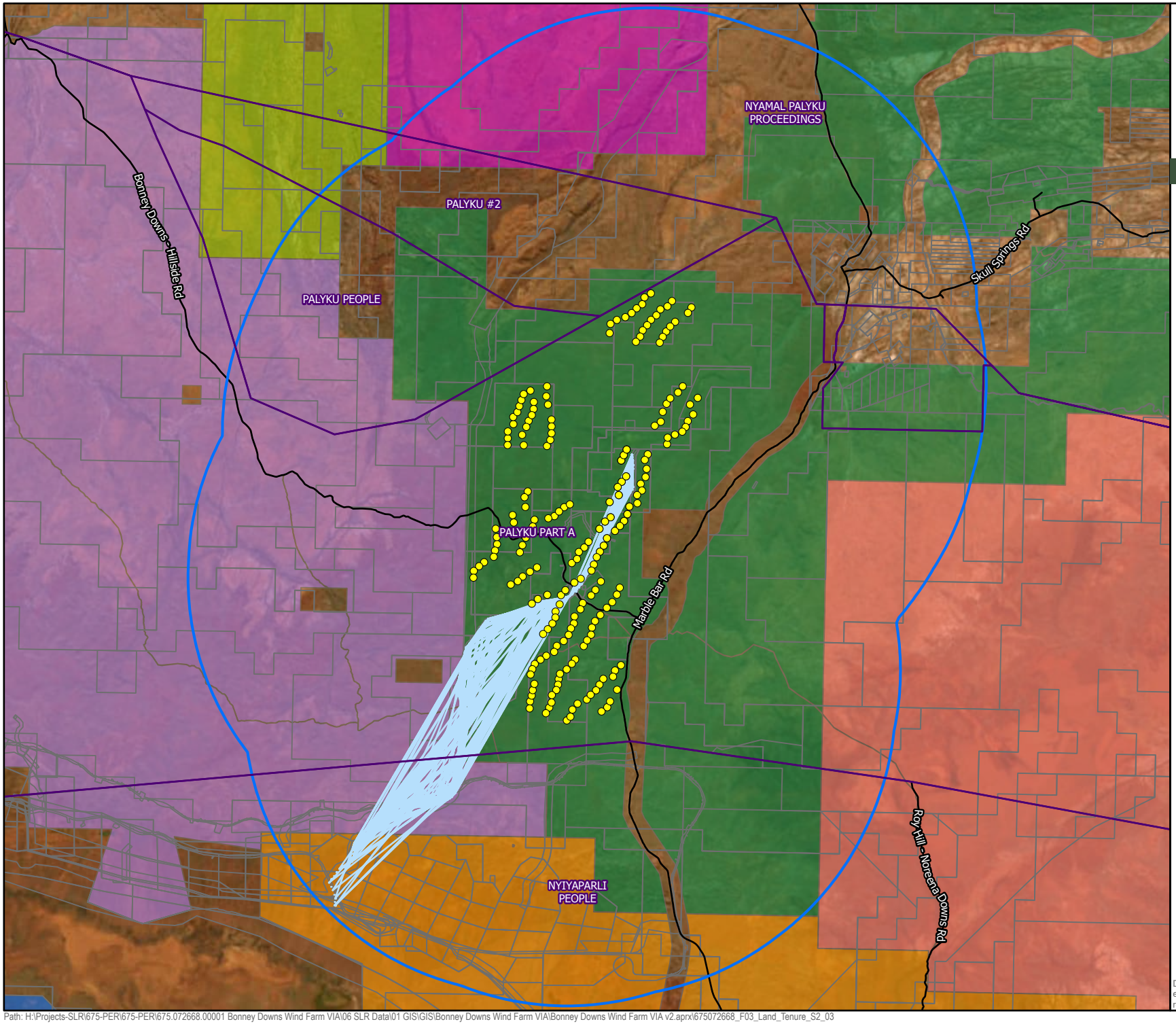
The Study Area is remote, and infrastructure is primarily limited to mines, haul roads, railways and Marble Bar Road which largely runs north to south through the middle of the Study Area. The town of Nullagine is located within the Study Area.

2.1.3 Land Use and Land Tenure

The Study Area represents a combination of various land use and land tenures. Most of the tenure is overlapping and is predominantly pastoral leases, mining tenements and native title determinations:

- Pastoral Lease:
  - Bonney Downs
  - Corunna Downs
  - Hillside
  - Noreena Downs
  - Panorama
  - Roy Hill
- Mining tenure, primary holders (by area) include:
  - Chichester Metals Pty Ltd
  - AMMM Resources Pty Ltd
  - FMG Nullagine Pty Ltd
  - Tambourah Metals Ltd
  - FMG Resources Pty Ltd
- Native Title Determination:
  - Nyamal Palyku Proceedings (WCD2024/001)
  - Nyiyaparli People (WCD2018/008)
  - Palyku #2 (WCD2021/006)
  - Palyku Part A (WCD2019/002)
  - Palyku People (WCD2021/003)

Figure 3 illustrates the range of land tenure above in relation to the Study Area. Note that there is no formal conservation estate in the Study Area.



BONNEY DOWNS WIND GENERATION HUB VIA

LAND TENURE

FIGURE 3

LEGEND

- Study Area
- Turbine Location
- Transmission Alignment
- Road
- Mining Act Tenements
- Native Title (Determination)

Pastoral Station

- Bonney Downs
- Corunna Downs
- Hillside
- Marillana
- Noreena Downs
- Panorma
- Roy Hill

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0 5 10 km

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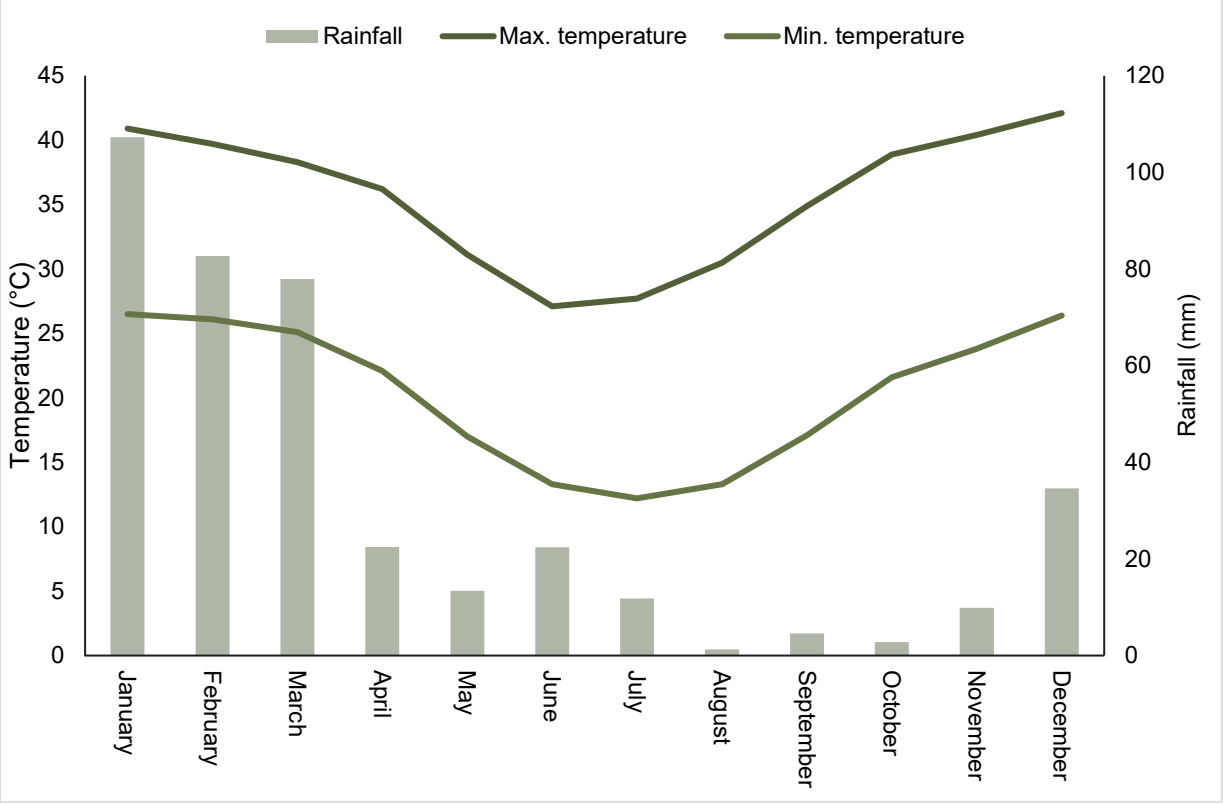
2.2 Physical Surrounds

While socio-economic and demographic factors are largely responsible for view experiences (e.g. people may view the land in the context of recreation/ tourism, or in the context in their role as an employee or contractor to the mining sector), the inherent visual amenity or landscape value is defined by biotic and abiotic environmental factors.

2.2.1 Climate

The climate of the region is characterised by a dry desert climate, typically with higher temperatures and lower rainfall, and often up to 12 months of dry weather, with hot dry summers and mild winters. Climate data was obtained from the Marble Bar (004106), which is the closest data collection site (Graph 1). The annual mean maximum temperature is 35.6ºC and the annual mean minimum temperature is 20.4ºC (BoM 2024). The region receives an average of 382.2 mm of rainfall annually.

Rainfall in the Pilbara varies significantly across the year as well as between years. Tropical cyclones, many of which originate in the Timor Sea, along with local thunderstorms, produce much of the summer and early autumn rainfall. The driest months are August to October, and the wettest months are January to March.



Graph 1: Marble Bar (004106; BoM 2024)

2.2.2 Land Systems

Land system mapping is based on regional patterns in topography, soils and vegetation, Land system mapping classifies the Pilbara into 106 land systems and is captured across three studies (Payne et al. 1988; Payne & Tille 1992; Van Vreeswyk et al. 2004). The extent of these land systems within the Study Area is summarized in Table 2 and Figure 4. All land systems are present beyond the Study Area.

Table 2: Extent of Land Systems within the Study Area

Land System	Description (DPIRD 2018)	Extent within Study Area (ha)	Proportion of Study Area (%)
Black system	Linear ridges of dolerite or basalt supporting hard spinifex grasslands, with unvegetated boulder slopes and rock piles along summits	1,168	0.3%
Bonney system	Low rounded hills and undulating stony plains supporting soft spinifex grasslands	29,008	6.2%
Boolgeeda system	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands	137	0.0%
Capricorn system	Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs	406	0.1%
Divide system	Gently undulating sandplains with minor dunes, supporting hard spinifex hummock grasslands with numerous shrubs	39,927	8.6%
Elimunna system	Stony plains on basalt supporting sparse acacia and cassia shrublands and patchy tussock grasslands	2,093	0.5%
Granitic system	Rugged granitic hills supporting shrubby hard and soft spinifex grasslands	5,770	1.2%
Jamindie system	Stony hardpan plains and rises supporting groved mulga shrublands, occasionally with spinifex understorey	66,394	14.3%
Jurrawarrina system	Hardpan plains and alluvial tracts supporting mulga shrublands with tussock and spinifex grasses	8,237	1.8%
Laterite system	Low lateritic plateaux, mesas, buttes and gravelly rises and plains supporting sparse mulga shrublands	398	0.1%
Macroy system	Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands	5,257	1.1%
McKay system	Hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands with acacias and occasional eucalypts	36,400	7.8%

Land System	Description (DPIRD 2018)	Extent within Study Area (ha)	Proportion of Study Area (%)
Mosquito system	Stony plains and prominent ridges of schist and other metamorphic rocks supporting shrubby hard spinifex grasslands	39,702	8.5%
Newman system	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands	20,411	4.4%
Pindering system	Gravelly hardpan plains supporting groved mulga shrublands with hard and soft spinifex	19,078	4.1%
River system	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex	5,263	1.1%
Robe system	Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands	4,036	0.9%
Rocklea system	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs	6,276	1.3%
Spearhole system	Gently undulating gravelly hardpan plains and dissected slopes supporting groved mulga shrublands and hard spinifex	131,314	28.2%
Talga system	Hills and ridges of greenstone and chert and stony plains supporting hard and soft spinifex grasslands	3,297	0.7%
Taylor system	Stony plains and isolated low hills of sedimentary rocks supporting hard and soft spinifex shrubby grasslands	12,342	2.7%
Turee system	Stony alluvial plains with gilgaied and non-gilgaied surfaces supporting tussock grasslands and grassy shrublands of mulga and snakewood	2,377	0.5%
Wona system	Basalt upland gilgai plains supporting Roebourne Plains grass and Mitchell grass tussock grasslands, minor hard spinifex grasslands or annual grasslands/herbfields	11,596	2.5%

2.2.3 Vegetation

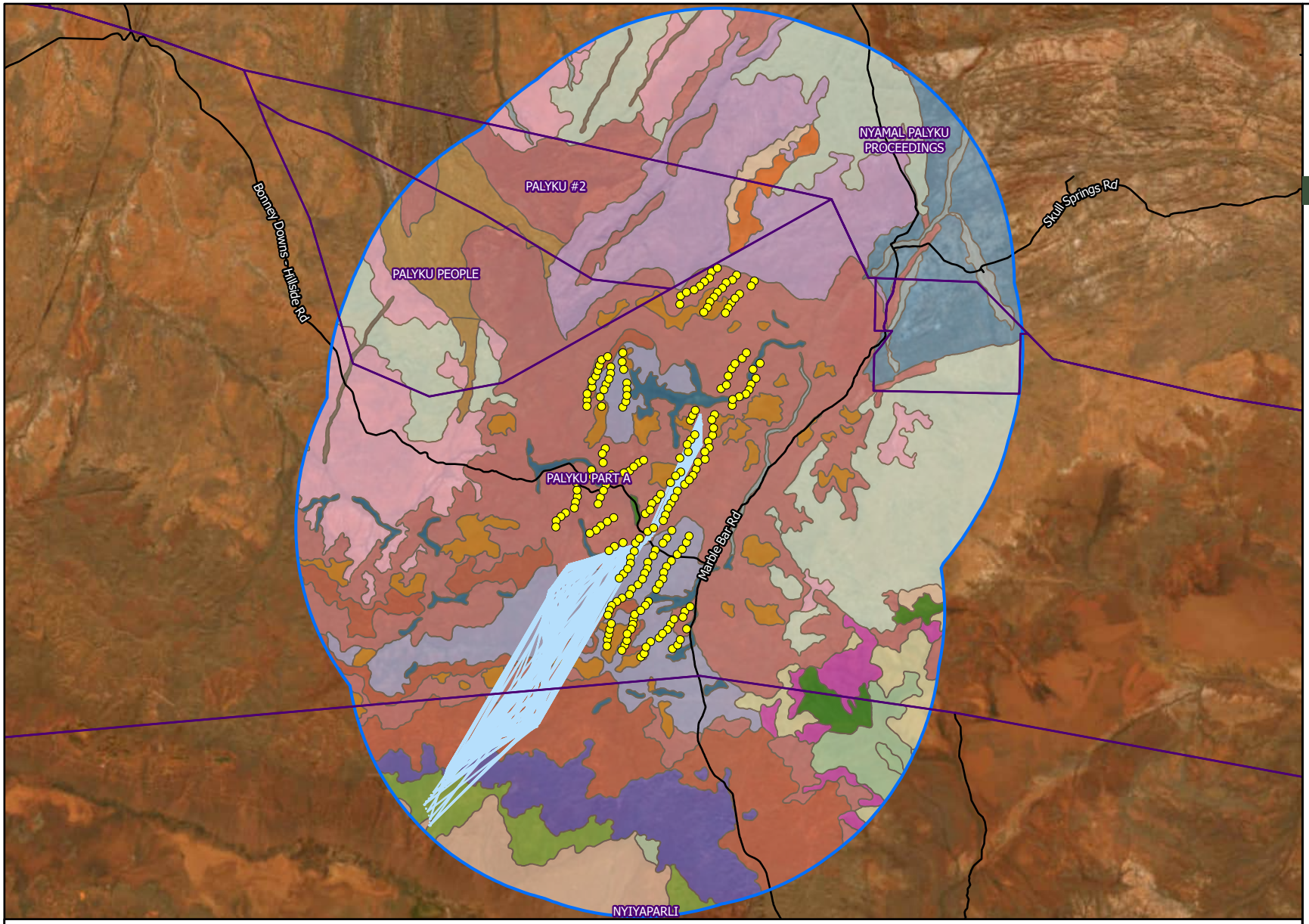
The Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological and geographical/ geological attributes. These bioregions are subdivided into 419 subregions, as part of a refinement of the IBRA framework. The Study Area is located across the Chichester subregion (PIL01) of the Pilbara bioregion and the Fortescue subregion (PIL02) of the Pilbara bioregion.

The Chichester subregion is dominated by undulating Archean granite and basalt plains supporting shrub steppe characterized by *Acacia pyrifolia* over *Triodia pungens* hummock grasslands (McKenzie, Keighery and Gibson n.d.). The Fortescue subregion is dominated by salt marsh, mulga-bunch grass, and short grass communities on alluvial plains. River Gum woodlands are present on the outskirts of drainage lines and scrub steppe is present on sandstone (McKenzie, Keighery and Gibson n.d.).

BONNEY DOWNS WIND GENERATION HUB VIA

LAND SYSTEMS

FIGURE 4



LEGEND

- Study Area
- Turbine Location
- Transmission Alignment
- Road
- Native Title (Determination)

Land System

- Adrian System
- Balfour System
- Billygoat System
- Black System
- Bonney System
- Boolaloo System
- Boolgeeda System
- Brockman System
- Buckshot System
- Calcrete System
- Capricorn System
- Coolibah System
- Coongimah System
- Cowra System
- Divide System
- Elimunna System
- Fan System
- Fortescue System
- Granitic System
- Jamindie System
- Jurrawarrina System
- Laterite System
- Macroy System
- Marillana System
- Marsh System
- McKay System
- Mosquito System
- Narbung System
- Newman System
- Oakover System
- Pindering System
- Platform System
- River System
- Robe System
- Robertson System
- Rocklea System
- Spearhole System
- Talga System
- Taylor System
- Turee System
- Urandy System
- Warri System
- Washplain System
- White Springs System
- Wona System
- Zebra System

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Path: H:\Projects-SLR\675-PER\675-PER\675.072668.00001 Bonney Downs Wind Farm VIA\06 SLR Data\01 GIS\GIS\Bonney Downs Wind Farm VIA\Bonney Downs Wind Farm VIA v2.aprx\675072668_F04_Land_Systems_S2_03

2.3 Valued Landscape Characteristics

Importance is placed on landscape by individuals, communities and public bodies. GLVIA (Landscape Institute 2013) describes landscapes as important as they provide:

- A shared resource
- An environment for flora and fauna
- The setting for day to day lives – for living, working and recreation
- Opportunities for aesthetic enjoyment
- A sense of place
- Continuity with the past through its relative permanence and its role in acting as a cultural record of the past
- A source of memories and associations, which in turn may contribute to wellbeing
- Inspiration for learning, as well as for art and other forms of creativity

In terms of visual value, VLPWA (WAPC 2007), identifies preferred natural landscape indicators as high degree of ‘naturalness’, landform and vegetation variety, presence of water, distinctive colours, seascapes, unusually expansive landforms (deserts, beach and dune fields, rolling hills), and distinctive landscape features.

A ‘value’ is an implicitly subjective term, however combining the GLVIA’s description of importance of landscapes and VPLWA’s definition of preferred landscapes indicator, the term ‘value’ is considered to be a feature that positively contributes to the visual character of the landscape or a feature that enables cultural pursuits.

The Study Area contains a variety of valued characteristics related to landscape. These primarily include:

- Aboriginal heritage
- Rivers and major waterways
- Ranges.

2.4 Viewshed Analysis

The viewshed analysis results indicated the Project was highly visible within a 12 km radius of the Project, with views often predicted to have more than 50 turbines in the view. Generally, views of the Project over 20 kilometres away are more limited due to the surrounding topography. In ideal conditions, at 32 km the turbines or wind farm could be seen in the background of the view where individual turbines and blade movement is less obvious, and the presence of the wind farm becomes part of the overall landscape (Palmer 2022). Sullivan et al. (2012) suggests a reasonable limit of visibility of turbines is a maximum of 58 km, at this distance turbines would be extremely difficult for most people to notice.

3.0 Methods

3.1 Section Summary

This VIA follows the first three steps of the five-step methodology outlined in the DPI/WAPC (2007) Guidelines for Visual Impact Assessments:

- Step 1. Describe existing visual landscape character
- Step 2. Describe the proposed development
- Step 3. Describe and evaluate the potential visual impacts

The remaining two steps of the DPI/WAPC (2007) relate to development of visual management measures and recommendations which are not covered in this VIA report.

The methods used are consistent with the current guidance for Landscape and Visual Impact Assessments. Impacts described in this report were determined from a combination of a Desktop Assessment, Field Assessment and Visual Impact Analysis. The methods are described below.

3.2 Desktop Assessment

3.2.1 Identifying Landscape Character Units

Landscape Character is typically defined by the combination of physical/environmental elements and aesthetic elements and socio-cultural elements. While it is possible to define the former using available data for environmental elements such as soil, geology and vegetation, the latter items can only be defined through consultation and firsthand experience.

LCUs were initially based on Land Systems, as the physical component of landscapes is generally heavily influenced by the geomorphology and vegetation of an area. Review of Land System descriptions against local-scale vegetation mapping, aerial imagery and photographs taken of the region during the site visit showed the similarities between several Land Systems from a VIA perspective, enabling them to be considered together. Large, modified landscape elements such as mines were also broadly mapped based on satellite imagery captured by Google on 01/09/2023. The final LCUs are shown in Figure 5.

3.2.2 Identification of Points of Interest

Thirteen POI were identified by Fortescue for the Project based on principles for potential use of the area and in consultation with Traditional Owners. Initially, twenty viewpoints were selected for assessment and visited during the field survey, however, these were refined to thirteen viewpoints for the final assessment (Figure 2).

3.3 Field Assessment

3.3.1 Survey Timing

Visual amenity and landscape values in the Study Area were surveyed on 2 to 5 August 2024 by a Project Consultant from SLR Consulting along with representatives from Fortescue's Heritage Team, Nyiyaparli and Palyku. The Study Area was traversed by vehicle, foot and helicopter. Each POI was visited, and its Global Position System (GPS) coordinates recorded. Key information on the site was also recorded in the format detailed in Table 3.

Table 3: Field Assessment Criteria

Criteria	Characteristics
Location	Co-ordinates
Site Name	Unique identification given for each site
POI Setting	The location of the site assessment described (e.g. 'north east corner of lookout' or 'end of pier')
Local Vegetation Type	General classification of vegetation at a site (shrubs, grasses, trees etc.)
Vegetation Screening Potential	Potential of surrounding vegetation to obscure views of the Project
Foreground Elements	Elements that make up the landscape in the immediate vicinity of the observer
Mid-Ground Elements	Elements that make up the landscape in between the foreground and background
Background Elements	Elements that make up the landscape furthest away from the observer
Viewer Motion	Speed that an observer may be moving at (affects view duration)
Accessibility	Level of accessibility of the area by members of the public (major roads = high, minor/local roads and tracks = moderate, private roads/remote tracks = low)
Usage Type	Apparent level of usage (based on signs of human activity such as vehicle tracks, extinguished fires, visual observation of activity etc.)
Photography	Number of, direction, settings, and any notes on photography from the location

3.3.2 Site Photography Specifications

All digital photos were taken with a Canon SLR Camera (DS126741) and a Canon EFS lens (18 to 55 mm). Images were taken from a height of approximately 1.6 m above ground. All images were captured using automatic settings at the maximum resolution of the camera. No in/on camera filters or effects were used.

3.4 Digital Analysis

3.4.1 3D Site Model

To allow for simulations of the predicted impact and generation of photomontages, key project elements were modelled using ArcGIS Pro and Autodesk 3ds Max. The 3D Model for the wind turbines was provided by Fortescue. The ground surface was defined by a default elevation source layer.

3.4.2 Viewshed

Digital elevation model (DEM) data were collected as a series of raster datasets. The resulting mosaic was compiled into a single seamless dataset for use in the viewshed analysis and to create a hillshade raster for use in the figures. The DEM is a terrain dataset that has been captured using radar technology. Being derived from radar there is no vegetation or structures within the elevation value of the dataset. Accuracies are as stated in the metadata for the dataset.

Viewshed analysis was performed using Geodesic Viewshed tool in ArcGIS Pro which includes curvature of the earth, refraction coefficient, turbine locations as the observer points at the designated turbine hub height and the DEM data to represent terrain and elevation. The results were checked using the ArcGIS Pro Exploratory 3D Analysis tool to ensure that the elevation data and the line of sight represented by the viewshed data correlated.

3.4.3 Photomontage Creation

The predicted operational views of the Project were created by positioning the 3D model was positioned within a bare earth virtual software environment to emulate the aspect, from which visibility of the Project from each of the POI was determined. Once an accurate representation of the terrain and development from a virtual location was obtained, a snapshot of the model was taken for all POI photographs with visibility of the Project then blended into a digital photograph from the site and rendered. This process incorporates consideration of vegetation screening as well as potential colouration and texture of site elements. The predicted closure view shows a scenario 1 year post decommissioning of the Project when all infrastructure has been removed however rehabilitation has not established. The predicted post 50-year view shows a scenario 50-years post decommissioning of the Project assuming that rehabilitation has been successful, note that some infrastructure may be retained into the future (e.g. roads that may be deemed useful by land-users). People and vehicles present in the four scenarios (current, operational, closure and post-50 years) have been retained to maintain consistency with the baseline view and ensure visual comparability. Their inclusion reflects practical considerations in photomontage preparation and does not represent specific predictions about activities in the post-decommissioning phases.

3.5 Visual Impact Analysis

3.5.1 Landscape Values and POI Sensitivity

The finalised LCUs were evaluated based on a visual landscape character preference and in the context of their rarity in the Study Area using the matrix shown in Table 4.

Visual landscape character preference was defined as per Appendix 7 of VLPWA (WAPC 2007), which identifies 'most preferred' natural landscape indicators and includes characteristics such as high degree of 'naturalness', landform and vegetation variety, presence of water, distinctive colours, seascapes, unusually expansive landforms (deserts, beach and dune fields, rolling hills), and distinctive landscape features. Less preferred characteristics include evidence of reduced quality or condition such as disturbance, weed infestation, erosion, and degraded water bodies.

Table 4: Evaluation Matrix for Landscape Value

		Visual Landscape Character Preference		
		Low (Little to no 'preferred' indicators; low quality/ condition)	**Moderate** (Some 'preferred' indicators; average to good quality/ condition)	**High** (Many 'preferred' indicators; very high quality/ condition)
Rarity	**Not Rare** (>20% Study Area)	Negligible	Low	Medium
	Somewhat Rare (>5% but <20% Study Area)	Low	Medium	High
	Rare (<5% Study Area)	Low	High	High

As described in VLPWA, significance of viewer experience and views increases with:

- Importance of views, including type, features and rarity
- Volume of use of roads, trails and navigable waterways
- Degree of sensitivity of viewers
- Degree to which experiencing the landscape is integral to enjoyment of a travel route or site
- Length of duration of a view.

POI sensitivity is derived from GLVIA3 and VLPWA using a combination of factors including:

- Viewer interest in the visual environment (high, medium, low, or negligible) interest in their everyday visual environment and the duration of the affect.
- Viewing opportunity (prolonged, regular viewing opportunities).
- Number of viewers and their distance / angle of view form the source of the effect, extent of screening / filtering of view.

POI in remote locations inaccessible by land-based vehicles but likely to be visited by Traditional Owners on an occasional basis are conservatively rated for their representativeness of local character or sense of place and rarity and/or uniqueness.

Whilst the assessment of the visual values and effects is largely measured on a qualitative basis, assessment against scale enables a more objective evaluation and comparison of sensitivity of POI and magnitude of effects.

The POI sensitivity rating is High, Medium, Low or Negligible and is described below in Table 5.

Table 5: POI Sensitivity/Value Ratings

Sensitivity	Definition
High	• Visitors to regionally important locations, scenic routes / regional gateways, lookouts within 2-3 km (or closer) with quality views, important views of the site and surrounding areas where landscape is the specific focus. • Views to landscape that are rare and / or unique and are possibly vulnerable to change. • Views from residences within 1 km of the site and are representative of high-quality views
Medium	• Travellers / visitors along roads or rail routes that are not scenic routes but offer quality views of significant landscape features. • Recreational users / viewers beyond 2-3 km from the site with moderate interest in their surrounds. • Medium numbers of visitors / residents (suburban and rural residents). • Views that are representative of local character or sense of place but are not rare or unique • Views from residences within 3 km buffer of the site or are representative of moderate quality views
Low	• Travellers / visitors along roads or rail routes that are not scenic routes but offer reasonable views of significant landscape features • Neighbourhood gateways that characterise the rural residential and residential visual quality of the area • Recreational users not dependent on views or scenic quality of landscape. • View experienced take in broad context with which site is visible but not an important element. • Small numbers of visitors with passing interest in their surroundings (those travelling along mid-level roads). • Viewers whose interest is not specifically focused on landscape or scenic qualities (local residents, commuters and workers)
Negligible	• Very occasional or low level of users with passing interest in their surrounds (those travelling along minor roads or views from the air). • Travellers / visitors along roads offering views greater than 1 km of the site.

3.5.2 Magnitude of Change

The magnitude of change to the landscape character depends on the nature, scale, intensity, extent, and duration of the impacts / change due to the development proposal. The magnitude of change also depends on the loss, change or addition of any features to the existing landscape and is based on the landscape character type that is most likely to be impacted by the project prior to the addition of any mitigation measures.

The magnitude of change is rated as High, Medium, Low or Negligible as described below in Table 6.

Table 6: Magnitude of Change

Magnitude	Definition
High	**Dominant Change:** • Major change in view at close distances, affecting substantial part of the view continuously visible for a long duration or obstructing a substantial part or important elements of the view. • Overwhelming loss or additional features in the view such as the nature of view or landscape character fundamentally changed. • Views to key landscape features affected. • Substantial change to the landscape due to loss of and / or change to elements, features or characteristics of the landscape creating an overall worsening of visual quality of the landscape character
Moderate	**Considerable Change:** • Clearly perceptible changes in views at intermediate distances resulting in either distinct new element in a significant part of the view or a more widely ranging, less concentrated change across a wider area. • Significant loss or addition of features in the view, such that the nature of view or character of landscape is altered. • Considerable contrast of any new features that the nature of the view or landscape character is changed. • Noticeable contrast of any new features or changes compared to existing landscape. • Views to key landscapes partially obstructed but views remain intact.
Low	**Noticeable Change:** • Minor memorable change to the landscape or views. • Temporary or reversible impact. • Landscape dominant element and built form / development well integrated within it. • Little permanent change or no fundamental change to local landscape character
Negligible	**Barely perceptible change:** • No memorable or rarely perceptible change to landscape character or key views
None	**No change:** • The Project is not visible • No change to landscape character or views

3.5.3 Impact Significance

The impact significance refers to the rate of effect that the proposed development will have on the visual landscape when viewed from key POI. It is the evaluation of the POI sensitivity and magnitude of change that identifies the extent to which the proposed changes will alter the existing landscape character.

Using impact statistics for determining landscape impacts in isolation of other human elements is not considered to be best practice under GLVIA3. At present, there are no standard categories for significance in consideration of all landscape components. GLVIA3 recommends that any method used is clear and consistent.

As outlined below in Table 7 the impact significance is determined via the lookup matrix where the ratings previously determined for POI sensitivity and magnitude of change inform the impact significance rating. The significance matrix is based on visual change in consideration of viewer interest in the environment, as aligned with VLPWA and GLVIA.

It is important to note that this matrix does not explicitly account for the cultural significance of views and landscape features, which may hold unique values and meanings that could influence the perceived impact on certain viewers or communities.

The impact significance is rated as High, Moderate-High, Moderate, Minor-Moderate, Minor, Minor-Negligible and Negligible

Table 7: Evaluation Matrix for Visual Impact Ratings

		Magnitude of Change			
		Negligible (Barely Perceptible Change)	**Low (Noticeable Change)**	**Moderate (Considerable Change)**	**High (Dominant Change)**
Sensitivity/Value	Negligible	Negligible	Minor-Negligible	Minor	Minor-Moderate
	Low	Minor-Negligible	Minor	Minor-Moderate	Moderate
	Medium	Minor	Minor-Moderate	Moderate	Moderate-High
	High	Minor-Moderate	Moderate	Moderate-High	High

The above matrix was used to rate potential visual impacts to all surveyed sites.

3.6 Limitations and Assumptions of the Viewshed and Photomontage Analysis

There are several limitations to consider when interpreting the results of the assessment. Most notably:

- The accuracy of the 3D Site Model, Viewshed and Photomontage are dependent on the accuracy of the available topographical data for the Study Area.
    - Viewsheds are generated through a Zone of Theoretical Visibility (ZTV) using a 3D model of the proposed development and surrounding topography, but do not account for existing vegetation due to the lack of available data, which may reduce visibility.

  - Photomontages are prepared by blending a visual representation of the proposed development with photographs of the actual landscape. Photomontages are intended to provide a representation of the predicted view as a tool for assessing potential visual impact. As such, there may be minor differences between the depiction in the photomontage and the actual development.

- Interpretation of photomontages is generally a subjective matter that is dependent on professional judgement. Where possible, a framework for clear and consistent impact judgement has been provided; and
- Characterisation of landscapes is largely based on professional judgement. The experiences and values often differ between individuals.

3.7 Shadow Flicker

The area and duration of any shadow flicker can be modelled using the WindPRO software package. The worst-case scenario is determined by assuming the following:

- No clouds or fog are present
- The turbines operate constantly with no maintenance shutdown
- The rotor blades are always perpendicular to the sun

These three criteria would rarely be met simultaneously. The worst-case scenario does not adjust for the seasonal variation in the intensity of the sun nor intervening vegetation which may be present. This is a conservative approach therefore it is expected that any predicted shadow flicker would be reduced in a real life case.

This assessment of the Bonney Downs Wind Farm modelled the potential impact of an EN-182-5.X/6.XMW turbine with a rotor diameter of 182 metres and a hub height of 190 metres (Plate 1). The maximum distance for the assessment has been limited the maximum distance for the assessment has been limited to the default software value of 2,148 metres which is conservative when compared the Draft National Wind Farm Development Guidelines (EHPC, 2010) of 265 x the maximum blade chord (1,299 metres).

The limiting factor for the impacts of shadow flicker is the duration that it occurs for at a given location of interest. These locations are typically residences and their immediate surrounds to a distance of 50 metres that are outside the development area of the wind farm (i.e., not signatory landowners to a project agreement).

At a national level, the Draft National Wind Farm Development Guidelines (EHPC, 2010) provide guidance on the assessment of wind farm shadow flicker. At State/Territory level, Victoria, NSW and Queensland also have their own guidelines that generally appear to follow the lead of the national guideline. Western Australia policy planning documents mention that shadow flicker can be an impact and should be considered, and reference is made to any codes, standards or guidelines that set requirements for what and how a shadow flicker assessment should be undertaken. SLR is not aware of any specific recommendations or guidelines being published within the Western Australian planning framework. The Draft National Wind Farm Development Guidelines (EHPC, 2010) therefore remain the benchmark standard for assessing wind farm shadow flicker on projects in Western Australia. It recommends the following shadow flicker duration limits at receiver locations:

- A theoretical value of 30 hours per year and a maximum of 30 minutes per day

If the theoretical value is exceeded:

- A realistic modelled or measured value of 10 hours per year and 30 minutes per day taking into account various real-world considerations.

Allowable limits for shadow flicker vary from country to country, however the generally agreed limit of 30 hours per year is widely used. The Australian Energy Infrastructure Commissioner (2022) concurs with this figure and notes that it is currently used across the country. From these varied sources it appears reasonable to use the 30 hours per year as the limit for this project.

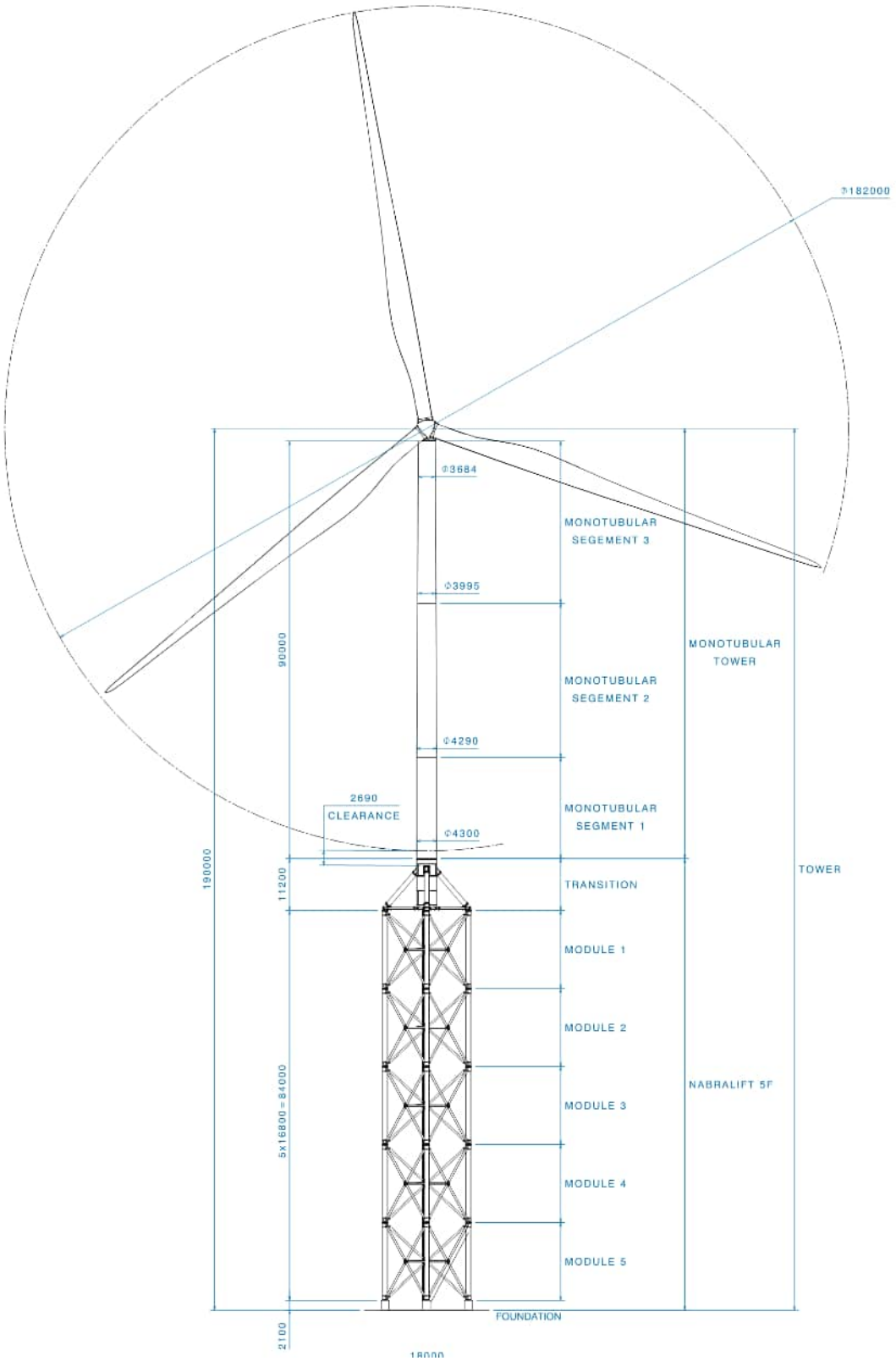


Plate 1: Turbine – Front View

3.7.1 Inputs

The modelling exercise included:

- Latitude and longitude coordinates of the 203 proposed wind turbine sites.
- Latitude and longitude coordinates for 20 surrounding viewer locations.
- WindPRO Global satellite imagery at 10 metre resolution
- Australian 1 arcsecond digital elevation model (DEM) data
- A custom turbine was created within WindPRO with the given hub height of 190 metres, rotor diameter of 182 metres, a maximum blade width of 4.9 metres and a blade width at 90% of the radius of 1.43 metres.
- Shadow flicker is assumed to occur at all hours when the sun is 3 degrees above the horizon (WindPRO Guide Chapter 6).
- Any vegetation that could provide a screening effect has not been included.
- Viewpoints and sensitive receivers have been modelled as looking in all directions at once rather than determining the orientation as a facade, this provides a level of conservatism in the model.

Allowable limits for shadow flicker vary from country to country, however a generally agreed limit of 30 hours/year is widely used. The Australian Energy Infrastructure Commissioner concurs with this figure and notes that it is currently used across the country. This limit is also referenced by the NSW Department of Planning, Housing and Infrastructure's Wind Energy Guideline released in November 2024. From these varied sources it appears reasonable to use the 30 hours/year as the limit for this project.

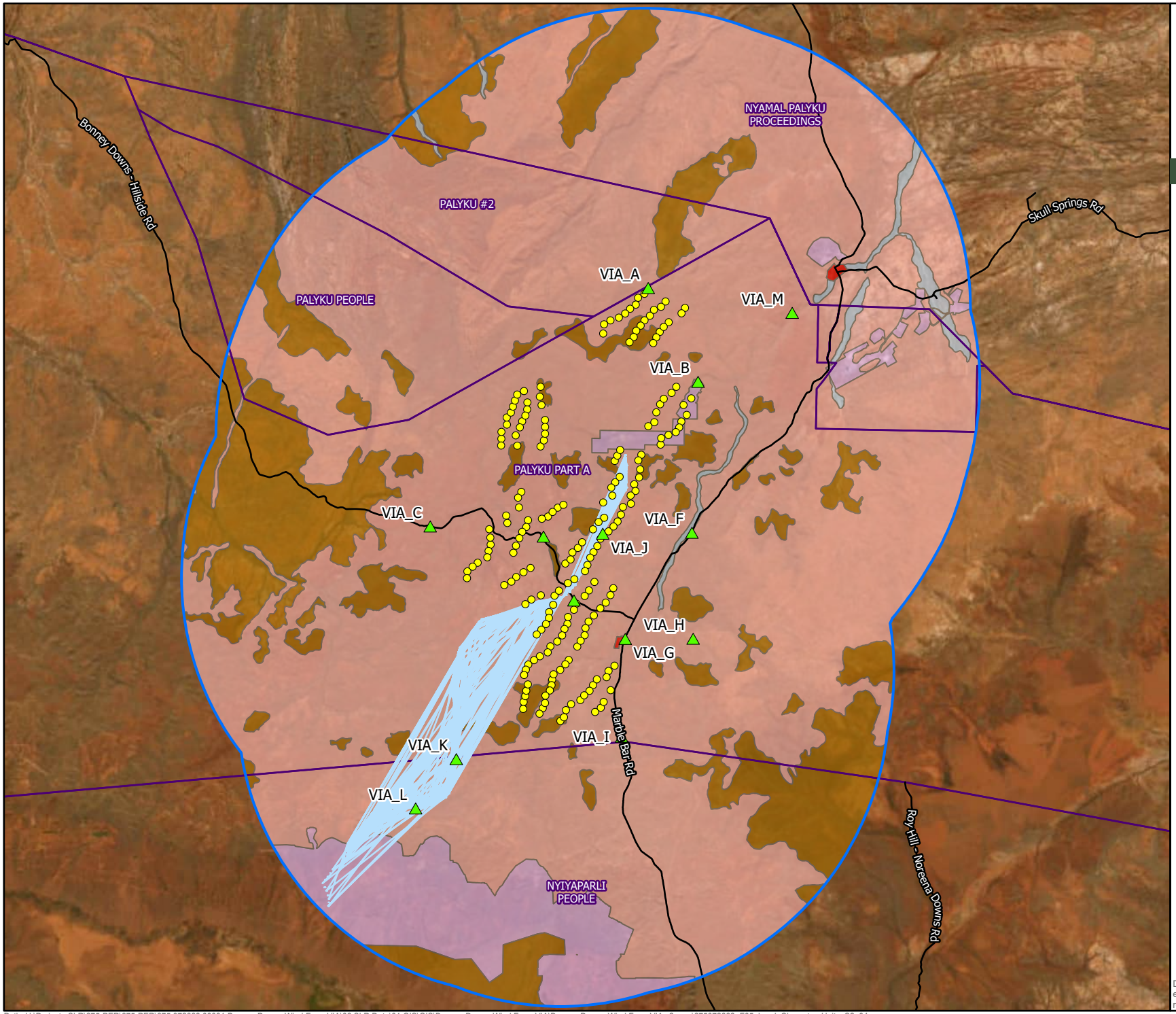
4.0 Results

4.1 Landscape Assessment

Five LCUs were identified within the Study Area (Figure 5):

- Plains
- Ranges, hills and low rises
- Major waterways and drainage lines
- Mining and infrastructure
- Townsites and residential.

The extent of these LCUs in the Study Area is summarised in Table 8 and descriptions of each LCU are summarized in Sections 4.1.1 to 4.1.5.



BONNEY DOWNS WIND GENERATION HUB VIA

LANDSCAPE CHARACTER UNITS

FIGURE 5

LEGEND

- Study Area
- Turbine Location
- Transmission Alignment
- POI
- Road
- Native Title (Determination)

Landscape Character Unit

- Mining and Infrastructure
- Plains
- Ranges, Hills and Low Rises
- Major Waterways and Drainage Lines
- Townsites and Residential

Service Layer Credits:
Earthstar Geographics, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

0 5 10 km

Coordinate System:	GDA 1994 MGA Zone 50
Scale:	1:450,000 at A4
Project Number:	675.072668.00002
Date Drawn:	12/06/2025
Drawn by:	CP
Reviewed by:	JM

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Table 8: Extent of LCUs in the Study Area

LCU	Area (ha)	% Study Area
Plains	74,123	15.9%
Ranges, Hills and Low Rises	358,279	77.1%
Major waterways and drainage lines	3,854	0.8%
Mining and Infrastructure	28,435	6.1%
Townsites and Residential	218	<0.1%

4.1.1 Plains

Plate 2 and Table 9 provides a summary description of the plains LCU.

Plate 2: Typical view of the plains LCU (Google 2024), looking southeast from Marble Bar Road, approximately 18 km south of Nullagine

Table 9: Details of the plains LCU

Criteria	Characteristics
Extent in Study Area	74,123 ha (15.9%)
Environmental Aspects	
Vegetation	Hardy shrublands and grasslands including spinifex (both hard and soft) and tussock grasslands, often interspersed with mulga and acacia shrublands

Criteria	Characteristics
Landforms	Plains
Related Land Systems	Boolgeeda, Divide, Elimunna, Jamindie, Jurrawarrina Macroy, Spearhole, Pindering, Taylor, Turee, Wona
Local Rarity	Somewhat Rare (>5% but <20% Study Area)
Values	
Visual Elements	Stony, clayey or sandy plains with mix of blue sky, various hues of green / brown vegetation, and ochre to pale earth.
Land Uses	Mineral exploration, pastoralism, and transportation. This landform is also likely used for traditional activities such as hunting and camping by native title holders
Landscape Value	**Medium** Somewhat Rare x Moderate Landscape Preference
Magnitude of Change	**Low** No fundamental change to landscape character
Landscape Impact	**Minor-Moderate**

4.1.2 Ranges, Hills and Low Rises

The following plates and Table 10 provide a summary description of the ranges, hills and low rises LCU.

Plate 3: Typical view of the ranges, hills and low rises LCU, looking west from VIA_K

Plate 4: Typical view of the ranges, hills and low rises LCU

Table 10: Details of the ranges, hills and low rises LCU

Criteria	Characteristics
Extent in Study Area	358,279 ha (77.1%)
Environmental Aspects	
Vegetation	Spinifex grasslands, both hard and soft, with scattered low acacia or mulga shrubs
Landforms	Ranges, hills, ridges, low rises, plateaux
Related Land Systems	Black, Bonney, Boolaloo, Capricorn, Granitic, Laterite, McKay, Mosquito, Newman, Robe, Rocklea, and Talga
Local Rarity	Not Rare (>20 % of Study Area)
Values	
Visual Elements	Mostly rounded hills or slopes, ochre earth, contrasting mix of blue sky, various hues of green/ brown vegetation.
Land Uses	Mineral exploration, pastoralism, and transportation. This landform is also likely used for traditional activities by native title holders.
Landscape Value	**Medium** Not Rare x High Landscape Preference
Magnitude of Change	**Low** No fundamental change to landscape character
Landscape Impact	**Minor-Moderate**

4.1.3 Major Waterways and Drainage Lines

Plate 5 and Table 11 provide a summary description of the River Plains LCU.

Plate 5: Typical view of the major waterways and drainage lines LCU, looking north from Nullagine River 5 km southwest of Nullagine

Table 11: Details of the major waterways and drainage lines LCU

Criteria	Characteristics
Extent in Study Area	3,854 ha (0.8%) This LCU has been mapped to the extent of land systems within the study area described by Van Vreeswyk, et. al. (2004) as having landforms primarily associated with water. It is estimated that this LCU would comprise more than 1% of the Study Area but likely less than 5% as major waterways and drainage lines occur across the whole Study Area but have not been mapped due to the lack of suitable spatial data.
Environmental Aspects	
Vegetation	Notably denser and more diverse than the surrounding landscape. Eucalyptus and acacias dominate the banks, creating shaded areas with grasses and spinifex.
Landforms	Lowest point of the landscape and intersects all land systems. Subject to ephemeral surface water flow, including overbank flooding from major channels and watercourses. Includes creek beds, banks and overbank areas associated with major waterways and drainage lines.

Criteria	Characteristics
Related Land Systems	River System but also occurs across all land systems within the Study Area
Local Rarity	Rare (<5% of Study Area)
Values	
Visual Elements	Plains or hills surrounding pools (or sandy riverbeds), flood plains, tall trees and a contrasting mix of blue sky and various hues of green, brown, and sometimes white vegetation.
Land Uses	Pastoralism. This landform is also likely used for traditional activities such as hunting and camping by native title holders.
Landscape Value	**High** Rare x High Landscape Preference
Magnitude of Change	**Negligible** Rarely perceptible change to landscape character
Landscape Impact	**Minor-Moderate**

4.1.4 Mining and Infrastructure

Table 12 provide a summary description of the mining and infrastructure LCU.

Table 12: Details of the mining and infrastructure LCU

Criteria	Characteristics
Extent in Study Area	28,435 ha (6.1%)
Environmental Aspects	
Vegetation	Limited remnant vegetation or surrounding vegetation
Landforms	Varied, dominant feature is built form mostly related to mining
Related Land Systems	N/A, this is an anthropogenic LCU
Local Rarity	Somewhat Rare (>5% but <20% Study Area)
Aesthetic Values	
Visual Elements	Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background
Socio-Cultural Values	
Land Uses	Mineral exploration, mining and pastoralism. This landform may also be used for traditional activities by native title holders.
Landscape Value	**Low** Somewhat Rare x Low Landscape Preference
Magnitude of Change	**None** No change in landscape character
Landscape Impact	**None**

4.1.5 Townsites and Residential

Plate 6 and Table 13 provide a summary description of the townsites and residential LCU.

Plate 6: Typical view of the townsites and residential LCU (Aussie Towns 2025)

Table 13: Details of the townsites and residential LCU

Criteria	Characteristics
Extent in Study Area	218 ha (<0.1%)
Environmental Aspects	
Vegetation	Limited remnant vegetation or surrounding vegetation
Landforms	Varied, dominant feature is built form mostly related to residential areas
Related Land Systems	N/A, this is an anthropogenic LCU
Local Rarity	Rare (<5% of Study Area)
Values	
Visual Elements	Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background.
Land Uses	Residential (Bonney Downs Station and the town of Nullagine)
Landscape Value	**High** Rare x Medium Landscape Preference

Criteria	Characteristics
Magnitude of Change	**None** No change in landscape character
Landscape Impact	**None**

4.2 Visual Impact Assessment of POIs

A total of 13 POIs were assessed during the field assessments. The locations of these points are presented in Table 14 and Figure 2.

The potential visual impact of the Project at the operational phase was assessed for all POIs. Assessment of POIs is provided in Sections 4.2.1 to 4.2.12, POI without visibility of the Project are bolded in Table 14.

Table 14: Surveyed POIs

POI	Easting	Northing	POI Sensitivity
VIA_A	804838	7574766	Medium
VIA_B	809204	7566547	High
VIA_C	785746	7553888	Medium
VIA_D	795664	7552999	Medium
VIA_E	798336	7547406	Medium
VIA_F	808668	7553336	Medium
VIA_G	802440	7543826	High
VIA_H	808775	7544058	Medium
VIA_I	802518	7535475	Medium
VIA_J	800857	7553255	Medium
VIA_K	788030	7533515	Medium
VIA_L	784467	7529198	Medium
VIA_M	**817451**	**7572591**	**High**

4.2.1 Assessment of VIA_A

Plate 7: VIA_A – Current view (360-degree)

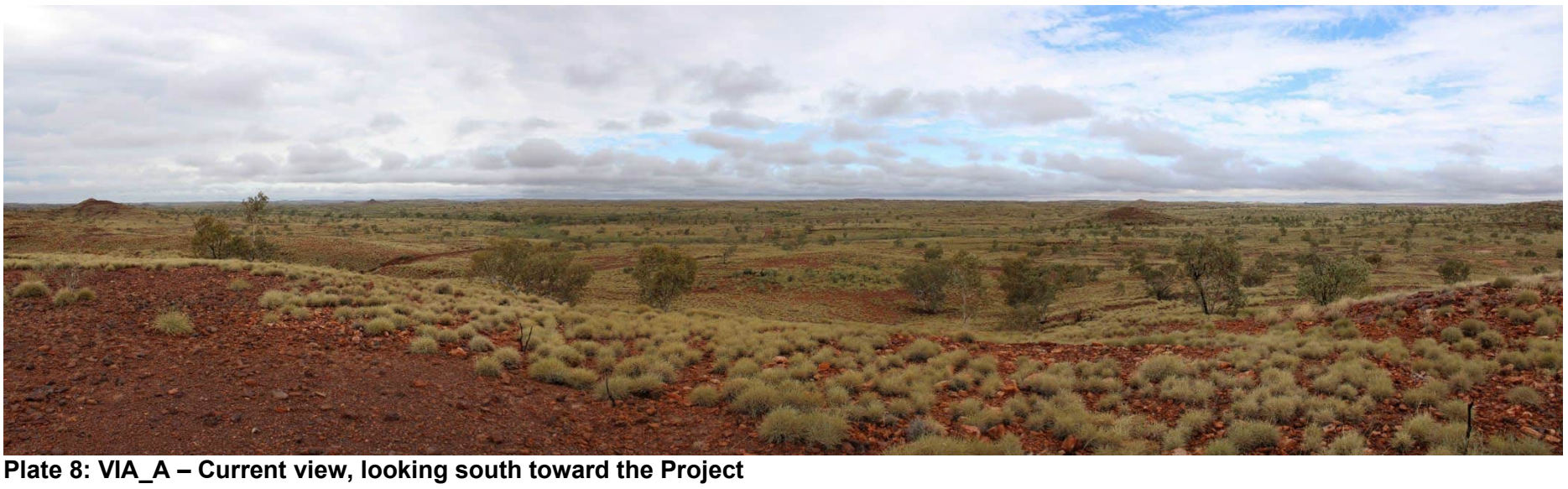

Plate 8: VIA_A – Current view, looking south toward the Project

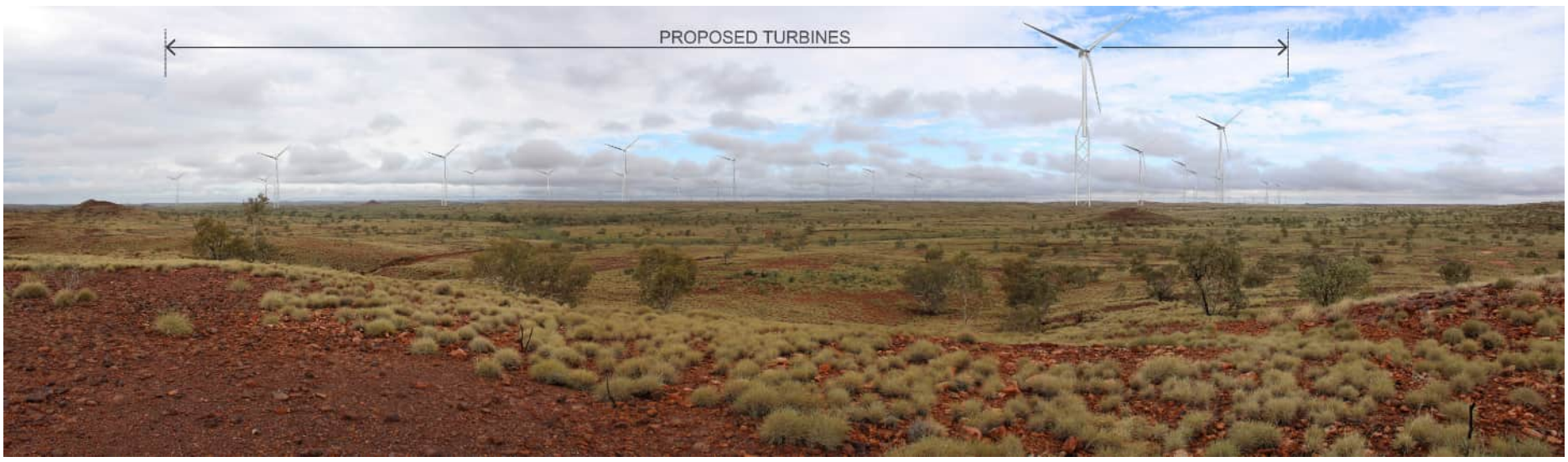

Plate 9: VIA_A – Operational view, looking south toward the Project

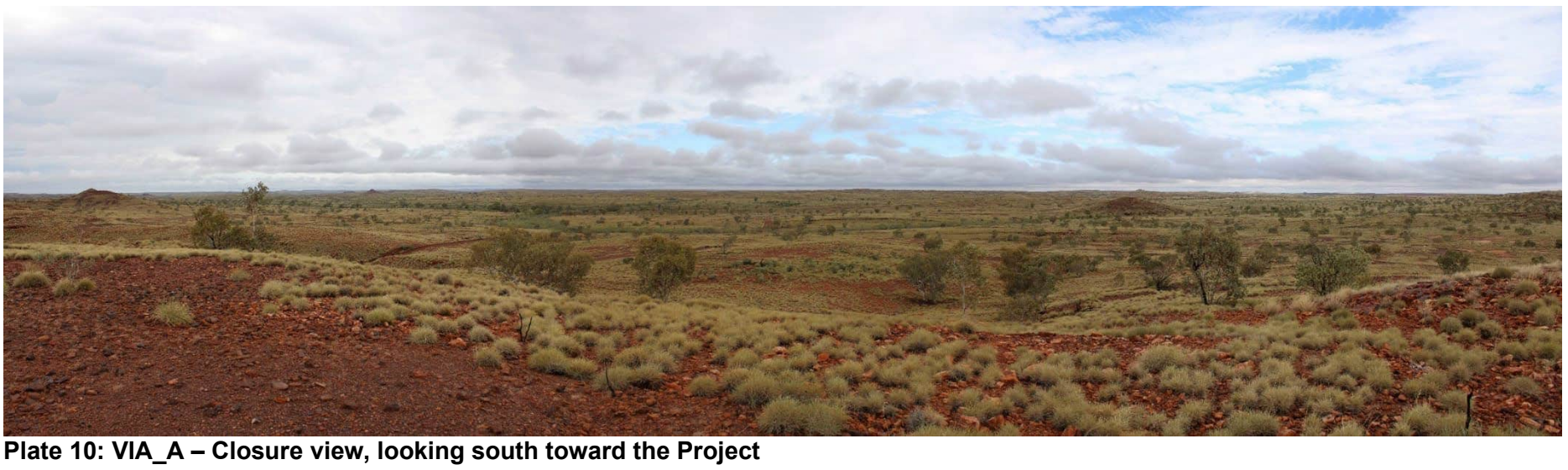

Plate 10: VIA_A – Closure view, looking south toward the Project

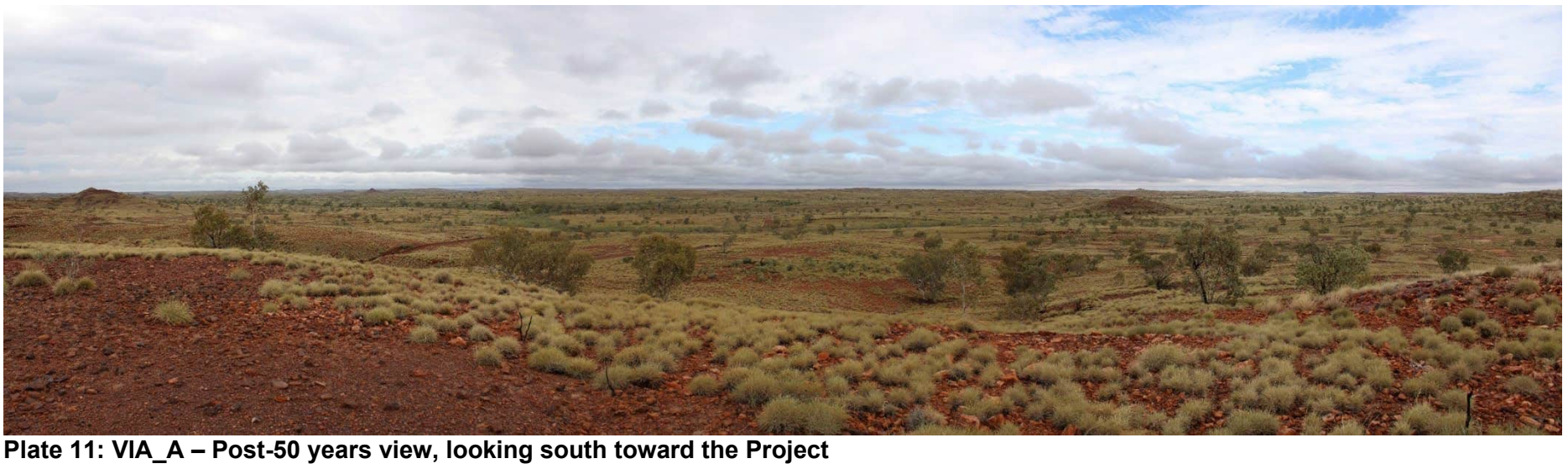

Plate 11: VIA_A – Post-50 years view, looking south toward the Project

VIA_A captures a view from an unnamed track on Bonney Downs Station, 0.7 km northwest from the Project's closest turbine in the view. The current view from VIA_A is a natural view, with several unnamed tracks running across the landscape in the foreground and midground. The predicted view is a partly natural view and partly modified view, with modified elements including the Project's wind turbines. The implementation of the Project results in an alteration of the nature of the view due to the clearly perceptible and wide-ranging change in the foreground to background of the view. Due to the view distance and screening elements, the closure view and the post-50 year view will return to the current view with removal of the turbines.

Table 15: Description of VIA_A

Criteria	Characteristic
Location	Easting / Northing: 0804838/7574766
Date	03/08/2024
Site Code	VIA_A
Viewpoint Setting	Top of hill
Local Vegetation Type	Spinifex, scattered trees
Screening Potential	0%
Viewer Motion	<10km/h
Accessibility	Low
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**Medium** Low access to POI as it is not located near a public road resulting in a very low number of visitors. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Scattered trees, rocky ground, spinifex
Mid-Ground Elements	Ridge, rocky outcrops, scattered trees, soft hills, gullies
Background Elements	Rolling hills, ranges and valleys
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible and wide-ranging change in the far foreground to background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate**

4.2.2 Assessment of VIA_B

Plate 12: VIA_B – Current view (360-degree)

Plate 13: VIA_B – Current view, looking south-southwest toward the Project

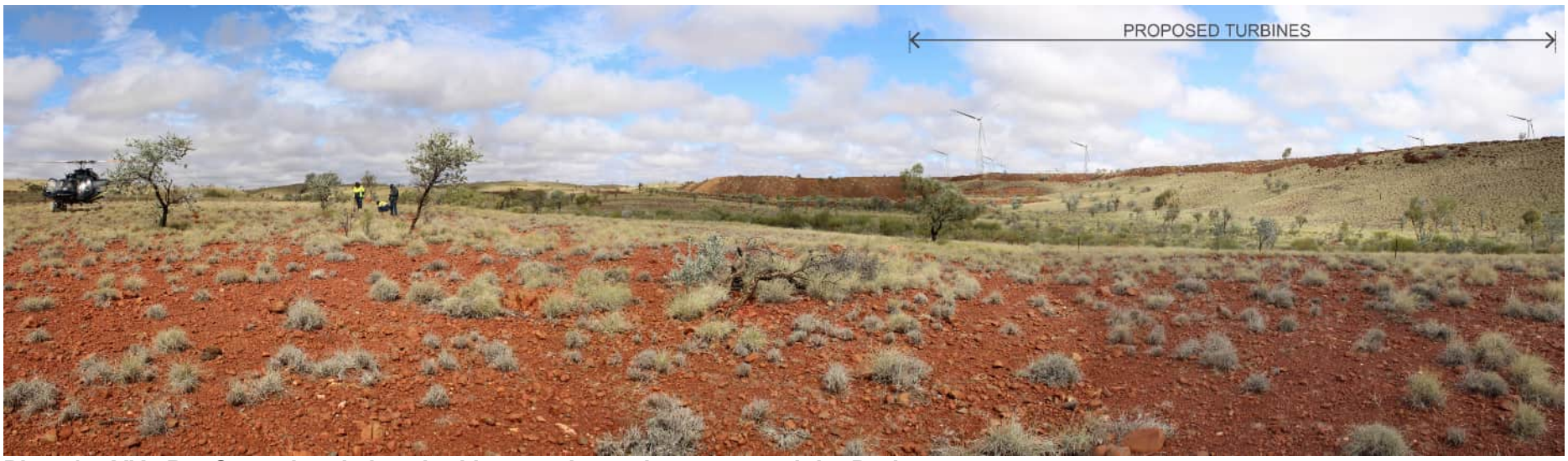

Plate 14: VIA_B – Operational view, looking south-southwest toward the Project

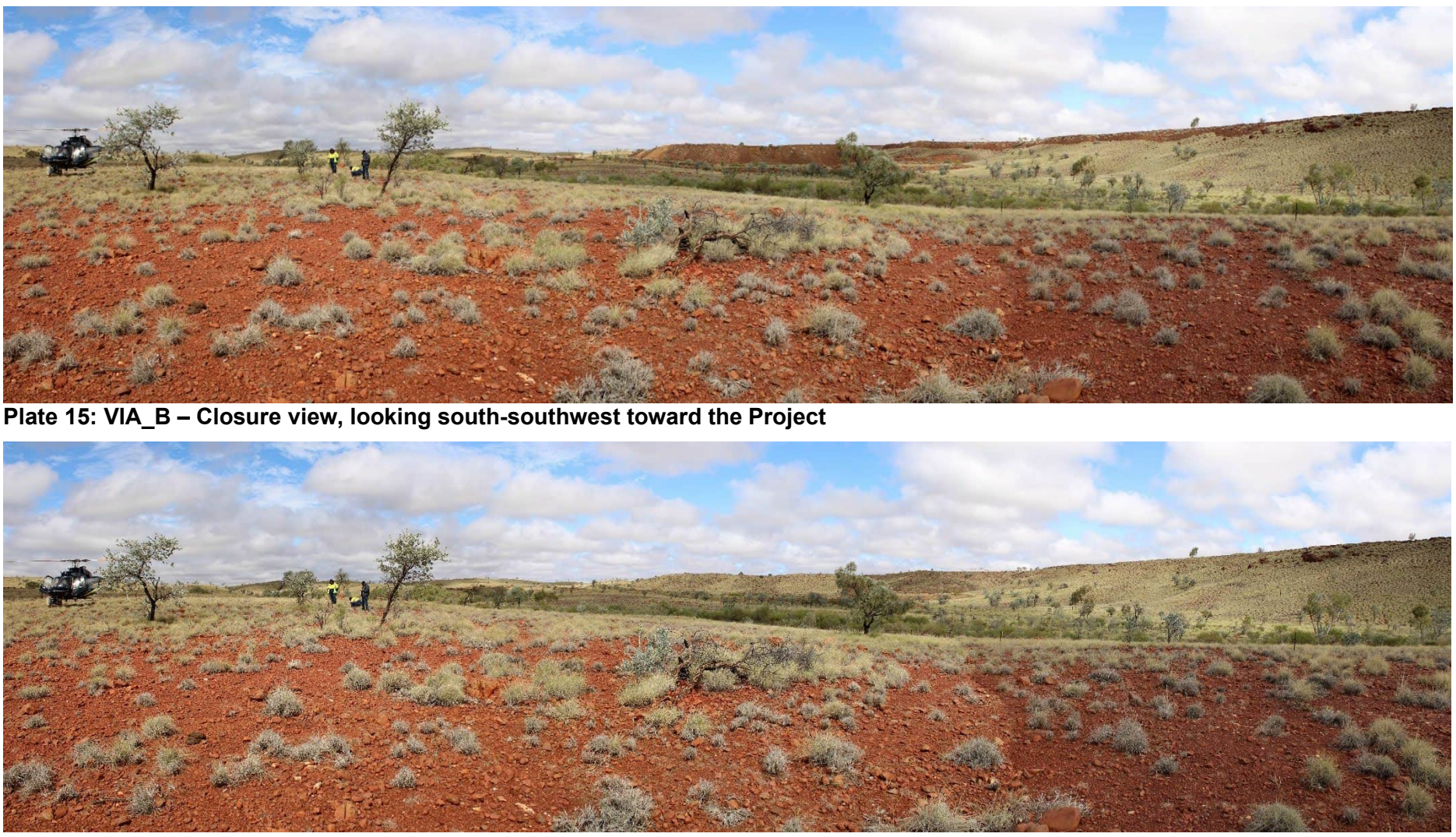

Plate 15: VIA_B – Closure view, looking south-southwest toward the Project

Plate 16: VIA_B – Post-50 years view, looking south-southwest toward the Project

VIA_B captures a view close to Bonnie Pool, 1.6 km north-northeast from the Project's closest turbine in the view. The current view from VIA_B is predominantly a natural view, with a waste rock dump, visible as part of Nullagine Iron Ore Mine. The predicted view is a partly natural view and partly modified view, with modified elements including the waste rock dump and the Project's wind turbines. The implementation of the Project results in an alteration of the nature of the view due to the clearly perceptible change in the midground to background of the view. Due to the view distance and screening elements, closure and rehabilitation activities associate with the Project will not be visible from VIA_B. The post-50 years view assumes there is no change to the final landforms of Nullagine Mine and that rehabilitation is successful.

Table 16: Description of VIA_B

Criteria	Characteristic
Location	Easting / Northing: 0809204/7566547
Date	03/08/2024
Site Code	VIA_B
Viewpoint Setting	Bonnie Pool
Local Vegetation Type	Spinifex, scattered trees
Screening Potential	20%
Viewer Motion	<10km/h
Accessibility	Low
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**High** High number of visitors to heritage site. Locally significant due to being a named water body and heritage site.
Visual Elements (Current View)	
Foreground Elements	Spinifex, scattered trees
Mid-Ground Elements	Creek, ridgeline, slopes, waste rock dump?
Background Elements	Sloping hills mostly screened by midground
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible change in the midground to background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate-High**

4.2.3 Assessment of VIA_C

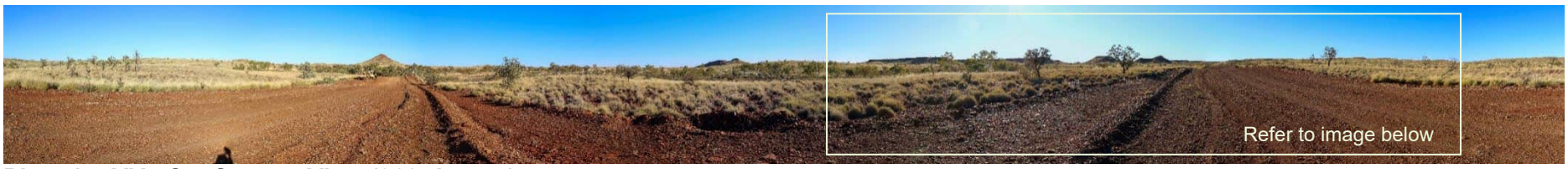

Plate 17: VIA_C – Current View (360-degree)

Plate 18: VIA_C – Current view, looking east-northeast toward the Project

Plate 19: VIA_C – Operational view, looking east-northeast toward the Project

Plate 20: VIA_C – Closure view, looking east-northeast toward the Project

Plate 21: VIA_C – Post-50 year view, looking east-northeast toward the Project

VIA_C captures a view from Bonney Downs-Hillside Road on Hillside Station, 5.2 km west from the Project's closest turbine in the view. Bonney Downs-Hillside Road is an unsealed public road that runs generally northwest-southeast. The current view from VIA_C is a predominantly natural view, with Bonney Downs-Hillside Road running from the foreground to the background. The predicted view is a partly natural view and partly modified view, with modified elements including the Bonney Downs-Hillside Road and the Project's wind turbines. The implementation of the Project results in an alteration of the nature of the view due to the clearly perceptible and wide-ranging change in the midground to background of the view. Due to the view distance and screening distance, the closure view and the post-50 year view will return to the current view with removal of the turbines.

Table 17: Description of VIA_C

Criteria	Characteristic
Location	Easting / Northing: 0785746/7553888
Date	06/08/2024
Site Code	VIA_C
Viewpoint Setting	Bonney Downs-Hillside Road
Local Vegetation Type	Spinifex, scattered trees
Vegetation/Topography Screening Potential	0%
Viewer Motion	<80km/h
Accessibility	Medium
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**Medium** Local public road likely utilised mainly by workers or residents and some tourists. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Spinifex, road
Mid-Ground Elements	Spinifex, scattered trees, slopes, road, creek
Background Elements	Rolling spinifex hills, peaks, ridges
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible and wide-ranging change in the mid-ground and background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate**

4.2.4 Assessment of VIA_D

Plate 22: VIA_D – Current view (360-degree)

Plate 23: VIA_D – Current view, looking southeast toward the Project

Plate 24: VIA_D – Operational view, looking southeast toward the Project

Plate 25: VIA_D – Closure view, looking southeast toward the Project

Plate 26: VIA_D – Post-50 years view, looking southeast toward the Project

VIA_D captures a view from Bonney Downs-Hillside Road on Bonney Downs Station, 3.1 km northwest from the Project's closest turbine in the view. Bonney Downs-Hillside Road is an unsealed public road that runs generally northwest-southeast. The current view from VIA_D is a predominantly natural view, with Bonney Downs-Hillside Road running from the foreground to the background. The predicted view is a partly natural view and partly modified view, with modified elements including the Bonney Downs-Hillside Road and Project's wind turbines. The implementation of the Project results in an alteration of the nature of the view due to the clearly perceptible and wide-ranging change in the midground to background of the view. Due to the view distance and screening elements, the closure view and the post-50 year view will return to the current view with removal of the turbines.

Table 18: Description of VIA_D

Criteria	Characteristic
Location	Easting / Northing: 0795664/7552999
Date	05/08/2024
Site Code	VIA_D
Viewpoint Setting	Bonney Downs-Hillside Road
Local Vegetation Type	Spinifex roadside with scattered trees.
Screening Potential	0%
Viewer Motion	<80km/h
Accessibility	Medium
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**Medium** Local public road likely utilised mainly by workers or residents and some tourists. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Road with spinifex grassland
Mid-Ground Elements	Road with spinifex and trees
Background Elements	Rolling hills with spinifex
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible and wide-ranging change in the mid-ground and background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate**

4.2.5 Assessment of VIA_E

Plate 27: VIA_E – Current view (360-degree)

Plate 28: VIA_E – Current view, looking north-northeast toward the Project

Plate 29: VIA_E – Operational view, looking north-northeast toward the Project

Plate 30: VIA_E – Closure view looking north-northeast toward the project

Plate 31: VIA_E – Post-50 years view, looking north-northeast toward the project

VIA_E captures a view from Bonney Downs-Hillside Road, 1 km southwest of the Project's closest turbine in the view. Bonney Downs-Hillside Road is an unsealed public road that runs generally northwest-southeast. The current view from VIA_E is predominantly a natural view, with modified elements including Bonney Downs-Hillside Road in the foreground to background and met-mast in the background. The predicted view is a partly natural view and partly modified view, with modified elements including Bonney Downs-Hillside Road in the foreground and midground, as well as the Project's wind turbines and transmission line and a met mast in the background. The implementation of the Project results in an alteration of the nature of the view due to the clearly perceptible and wide-ranging change in the background of the view. Due to the view distance, the closure view and the post-50 year view will return to the current view with removal of the turbines and transmission line.

Table 19: Description of VIA_E

Criteria	Characteristic
Location	Easting / Northing: 0798336/7547406
Date	05/08/2024
Site Code	VIA_E
Viewpoint Setting	Bonney Downs-Hillside Road
Local Vegetation Type	Spinifex, scattered trees
Screening Potential	0%
Viewer Motion	<80km/h
Accessibility	Medium
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**Medium** Local public road likely utilised mainly by workers or residents and some tourists. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Road
Mid-Ground Elements	Road, communication tower, spinifex slopes with scattered trees
Background Elements	Hills, ridges and ranges
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible and wide-ranging change in the background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate**

4.2.6 Assessment of VIA_F

Plate 32: VIA_F – Current view (360-degree)

Plate 33: VIA_F – Current view, looking west toward the Project

Plate 34: VIA_F – Operational view, looking west toward the Project

Plate 35: VIA_F – Closure view, looking west toward the Project

Plate 36: VIA_F – Post-50 years view, looking west toward the Project

VIA_F captures a view from Marble Bar Road, 5.9 km southeast of the Project's closest turbine in the view. Marble Bar Road is a partly sealed, partly unsealed public road that runs generally north-south. The current view from VIA_F is predominantly a natural view, with Marble Bar Road in the foreground to background. The predicted view remains a predominantly natural view with modified elements including Marble Bar Road in the foreground to background and the Project's wind turbines in the background. The turbines largely blend into the white clouds of this view but would more visible during weather with clear blue skies (see VIA_G for an example of this). The implementation of the Project increases modified characteristics of the view however, it does not significantly change the existing character, remaining a predominantly natural view from VIA_F. Due to the view distance, the closure view and the post-50 year view will return to the current view with removal of the turbines.

Table 20: Description of VIA_F

Criteria	Characteristic
Location	Easting / Northing: 0808668/7553336
Date	04/08/2024
Site Code	VIA_F
Viewpoint Setting	Marble Bar Road
Local Vegetation Type	Scattered trees, spinifex
Vegetation/Topography Screening Potential	80%
Viewer Motion	<110km/h
Accessibility	High
Usage Type	Medium
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**Medium** Main public road likely utilised by workers, residents and tourists. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Road, rocky outcrops, bare rocky ground, spinifex
Mid-Ground Elements	Road, rocky outcrops, bare rocky ground, spinifex, creek
Background Elements	Spinifex hills
Impact Analysis (Operational View)	
Magnitude of Change	**Low** Minor memorable change to the view that does not result in a change to the existing character of the view.
Visual Impact	**Minor-moderate**

4.2.7 Assessment of VIA_G

Plate 37: VIA_G – Current view (360-degree)

Plate 38: VIA_G – Current view, looking west toward the Project

Plate 39: VIA_G – Operational view, looking west toward the Project

Plate 40: VIA_G – Closure view, looking west toward the Project

Plate 41: VIA_G – Post-50 years view, looking west toward the Project

VIA_G captures a view from the Bonney Downs Homestead, 2.3 km north-northeast of the Project's closest turbine in the view. The current view from VIA_G is a predominantly natural view and with modified elements including Bonney Downs Station tracks and laydown areas in the foreground to midground. The predicted view is a partly natural view and partly modified view, with modified elements including the Bonney Downs Station tracks and laydown areas and the Project's wind turbines. The implementation of the Project results in an alteration of the nature of the view due to the clearly perceptible and wide-ranging change in the midground to background of the view. Due to the view distance and screening distance, the closure view and the post-50 year view will return to the current view with removal of the turbines.

Table 21: Description of VIA_G

Criteria	Characteristic
Location	Easting / Northing: 802440/7543826
Date	03/08/2024
Site Code	VIA_G
Viewpoint Setting	Bonney Down Station Homestead
Local Vegetation Type	Spinifex, scattered trees
Screening Potential	0%
Viewer Motion	<80km/h
Accessibility	Medium (public road)
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**High** Residence and tourist/visitor accommodation with quality views of surrounding landscape.
Visual Elements (Current View)	
Foreground Elements	Road, spinifex with rocky ground, and scattered trees.
Mid-Ground Elements	Drainage line, road, and shed
Background Elements	Hills screened by midground
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible and wide-ranging change in the mid-ground and background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate-high**

4.2.8 Assessment of VIA_H

Plate 42: VIA_H – Current view (360-degree)

Plate 43: VIA_H – Current view looking northwest toward the Project

Plate 44: VIA_H – Operational view looking northwest toward the Project

Plate 45: VIA_H – Closure view, looking northwest toward the Project

Plate 46: VIA_H –Post-50 years view, looking northwest toward the Project

VIA_H captures a view from Bonney Downs-Noreena Road, 5.9 km southeast of the Project's closest turbine in the view. Bonney Downs-Noreena Road is an unsealed public road that runs generally northeast-southeast. The current view from VIA_H is a natural view, with Bonney Downs-Noreena Road in the foreground. The predicted view is a predominantly natural view, with modified elements including Bonney Downs-Noreena Road and the Project's wind turbines. The implementation of the Project results in a minor memorable change to the view due to the turbines being partly visible in a small portion of the view. Due to the view distance and screening elements, the closure view and the post-50 years view will return to the current view with removal of the turbines.

Table 22: Description of VIA_H

Criteria	Characteristic
Location	Easting / Northing: 0808775/7544058
Date	04/08/2024
Site Code	VIA_H
Viewpoint Setting	Bonney Downs-Noreena Road
Local Vegetation Type	Spinifex grassland
Vegetation/Topography Screening Potential	80%
Viewer Motion	<80km/h
Accessibility	Medium
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**Medium** Local public road likely utilised mainly by workers or residents and some tourists. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Spinifex with bare muddy ground, pooling water
Mid-Ground Elements	Scattered trees, creek, road, spinifex
Background Elements	Hills / ranges, predominantly screened by midground
Impact Analysis (Operational View)	
Magnitude of Change	**Negligible** Rarely perceptible change to views
Visual Impact	**Minor**

4.2.9 Assessment of VIA_I

Plate 47: VIA_I – Current view, looking north toward the Project

Plate 48: VIA_I – Operational view, looking north toward the Project

Plate 49: VIA_I – Closure view, looking north toward the Project

Plate 50: VIA_I – Post-50 years view, looking north toward the Project

VIA_I captures a view from Marble Bar Road, 3.1 km southeast of the Project's closest turbine in the view. Marble Bar Road is a partly sealed, partly unsealed public road that runs generally north-south. The current view from VIA_I is predominantly a natural view, with Marble Bar Road in the foreground to background. The predicted view is a partly natural view and partly modified view, with modified elements including the Marble Bar Road and the Project's wind turbines. The implementation of the Project results in an alteration of the nature of the view due to the clearly perceptible in the midground to background of the view. Due to the view distance and screening elements, the closure view and the post 50-year view will return to the current view with removal of the turbines.

Table 23: Description of VIA_I

Criteria	Characteristic
Location	Easting / Northing: 0802518/7535475
Date	06/08/2024
Site Code	VIA_I
Viewpoint Setting	Marble Bar Road
Local Vegetation Type	Scattered trees, spinifex
Screening Potential	0%
Viewer Motion	<80km/h
Accessibility	High
Usage Type	Medium
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: N (a 360 degree view was not taken from this location as per instructions from Fortescue)
Sensitivity	**Medium** Main public road likely utilised by workers, residents and tourists. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Road, bare rocky ground
Mid-Ground Elements	Rolling hills with spinifex, road
Background Elements	Hills mostly screened by midground
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible change in the background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate**

4.2.10 Assessment of VIA_J

Plate 51: VIA_J – Current view (360-degree)

Plate 52: VIA_J – Current view, looking north-northeast toward the Project

Plate 53: VIA_J – Operational view, looking north-northeast toward the Project

Plate 54: VIA_J – Closure view, looking north-northeast toward the Project

Plate 55: VIA_J – Post-50 years view, looking north-northeast toward the Project

VIA_J captures a view from a station track on Bonney Downs Station parallel to Nullagine Mine Haul Road, 0.5 km southwest of the Project's closest turbine in the view. The current view from VIA_J is a predominantly natural view with modified elements including a station track and fence in the foreground to background and Nullagine Mine Haul Road in the midground to background. The predicted view is a predominantly natural view and partly modified view, with modified elements including the station track, fence and Nullagine Mine Haul Road, as well as the Project's wind turbines and transmission line in the foreground to background. The implementation of the Project results in substantial additional features such that the nature of the view is changed. Due to the view distance, the closure view and the post-50 year view will return to the current view with removal of the turbines and transmission line.

Table 24: Description of VIA_J

Criteria	Characteristic
Location	Easting / Northing: 0800857/7553255
Date	04/08/2024
Site Code	VIA_J
Viewpoint Setting	Nullagine Mine Haul Road, station track
Local Vegetation Type	Scattered and clustered trees, spinifex
Screening Potential	0%
Viewer Motion	<80km/h
Accessibility	Low
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**Medium** Low access to POI as it is not located near a public road resulting in a very low number of visitors. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Fence, track, spinifex
Mid-Ground Elements	Track, scattered and clustered trees, spinifex, fence
Background Elements	Communications tower, rolling hills
Impact Analysis (Operational View)	
Magnitude of Change	**Moderate** Clearly perceptible and wide-ranging change in the mid-ground and background of the view resulting in a distinct new element altering the nature of the view but not fundamentally changed.
Visual Impact	**Moderate**

4.2.11 Assessment of VIA_K

Plate 56: VIA_K – Current view (360-degree)

Plate 57: VIA_K – Current view, looking north toward the Project

Plate 58: VIA_K – Operational view, looking north toward the Project

Plate 59: VIA_K – Closure view, looking north toward the Project

Plate 60: VIA_K – Post-50 years view, looking north toward the Project

VIA_K captures a view from Nullagine Mine Haul Road, 7.3 km southwest west-southwest of the Project's closest turbine in the view. Nullagine Mine Haul Road is a partly sealed private road that runs generally north-south. The current view from VIA_K is predominantly a natural view, with Nullagine Mine Haul Road in the foreground to midground. The predicted view remains a predominantly natural view with modified elements, including Nullagine Mine Haul Road and the Project's transmission line in the foreground to midground and the Project's turbines just visible behind the hill in the far midground. The Project increases the modified characteristics of the view however it does not significantly change the existing character, remaining a predominantly natural view from VIA_K. Due to the view distance, the closure view and the post-50 year view will return to the current view with removal of the transmission line.

Table 25: Description of VIA_K

Criteria	Characteristic
Location	Easting / Northing: 0788030/7533515
Date	02/08/2024
Site Code	VIA_K
Viewpoint Setting	Nullagine Mine Haul Road
Local Vegetation Type	Spinifex, scattered trees and shrubs
Screening Potential	90%
Viewer Motion	<80km/h
Accessibility	Low (private, rarely used haul road)
Usage Type	Low ((private, rarely used haul road)
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360-degree view
Sensitivity	**Medium** Low access to POI as it is not located near a public road resulting in a very low number of visitors. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Haul road, spinifex, trees and shrubs
Mid-Ground Elements	Haul road, spinifex, trees and shrubs, hills
Background Elements	Hills predominantly screened by foreground and midground
Impact Analysis (Operational View)	
Magnitude of Change	**Negligible** Rarely perceptible change to views
Visual Impact	**Minor**

4.2.12 Assessment of VIA_L

Plate 61: VIA_L – Current view (360-degree)

Plate 62: VIA_L – Current view, looking northeast toward the Project

Plate 63: VIA_L – Operational view, looking northeast toward the Project

Plate 64: VIA_L – Closure view, looking northeast toward the Project

Plate 65: VIA_L – Post-50 years view, looking northeast toward the Project

VIA_L captures a view from Nullagine Mine Haul Road, 12.8 km southwest of the Project's closest turbine. Nullagine Haul Road is a partly sealed private road that runs generally north-south. The current view from VIA_L is predominantly a natural view, with Nullagine Mine Haul Road in the foreground to background. The predicted view remains a predominantly natural view with modified elements, including Nullagine Mine Haul Road in the foreground to midground and the Project's transmission line in the midground to background. The Project's wind turbines are not predicted to be visible from VIA_L. The Project increases the modified characteristics of the view however it does not significantly change the existing character, remaining a predominantly natural view from VIA_L. Due to the view distance, the closure view and the post-50 year view will return to the current view with removal of the transmission line.

Table 26: Description of VIA_L

Criteria	Characteristic
Location	Easting / Northing: 0784467/7529198
Date	02/08/2024
Site Code	VIA_L
Viewpoint Setting	Nullagine Mine Haul Road
Local Vegetation Type	Spinifex, tall shrubs
Vegetation/Topography Screening Potential	0%
Viewer Motion	<80km/h
Accessibility	Low (private, rarely used haul road)
Usage Type	Low ((private, rarely used haul road)
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360-degree view
Sensitivity	**Medium** Low access to POI as it is not located near a public road resulting in a very low number of visitors. Views are representative of local character or sense of place but are not rare or unique
Visual Elements (Current View)	
Foreground Elements	Spinifex, tall shrubs, haul road
Mid-Ground Elements	Haul road, plain with spinifex, trees and shrubs
Background Elements	Ridgelines, hills, communications tower
Impact Analysis (Operational View)	
Magnitude of Change	**Low** Minor memorable change to the view that does not result in a change to the existing character of the view.
Visual Impact	**Minor-moderate**

4.2.13 Assessment of VIA_M

Plate 66: VIA_M – Current view (360-degree)

Plate 67: VIA_M – Current view, looking southwest toward the Project

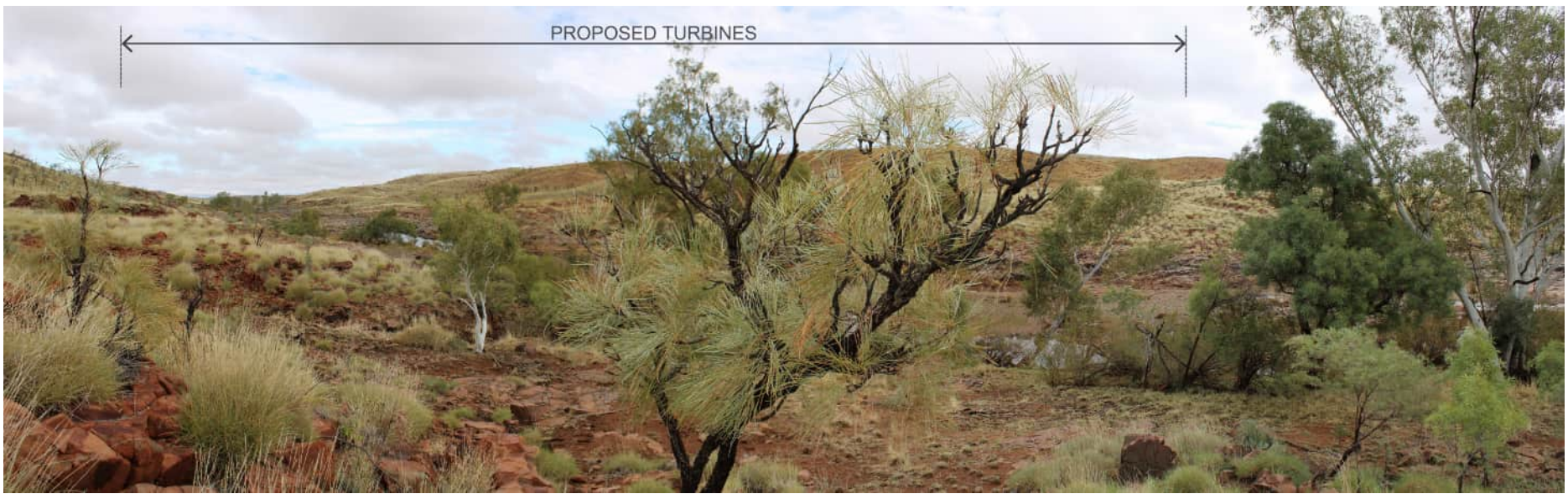

Plate 68: VIA_M – Operational view, looking southwest toward the Project

Plate 69: VIA_M – Closure view, looking southwest toward the Project

Plate 70: VIA_M – Post-50 years view, looking southwest toward the Project

VIA_M captures a view close from Nullagine River, 9.4 km east from the Project's closest turbine. The current view from VIA_M is a natural view of Nullagine River. The Project is not expected to be visible from VIA_M due to view distance and screening from topography.

Table 27: Description of VIA_M

Criteria	Characteristic
Location	Easting / Northing: 817451/7572591
Date	03/08/2024
Site Code	VIA_M
Viewpoint Setting	Nullagine River
Local Vegetation Type	Tall trees, scattered shrubs, spinifex
Vegetation/Topography Screening Potential	100%
Viewer Motion	<10km/h
Accessibility	Low
Usage Type	Low
Photography	Automatic exposure settings Canon SLR Camera (DS126741) Canon EFS lens (18 to 55mm) Shots taken on lowest zoom setting (18mm) Facing: 360 degree view
Sensitivity	**High** Low access to POI as it is not located near a public road resulting in a very low number of visitors. Locally significant due to being a named water body. Views to landscape (i.e., a major river) that are rare in the context of the Pilbara
Visual Elements (Current View)	
Foreground Elements	Rocky outcrops, trees, spinifex
Mid-Ground Elements	Rocky outcrops spinifex, scattered trees, sloping hills, river
Background Elements	Sloping hills, river, mostly screened by midground
Impact Analysis (Operational View)	
Magnitude of Change	**None** The Project is not visible
Visual Impact	**None** The Project is not visible

4.3 Shadow Flicker Assessment

Shadow flicker is the effect experienced by an observer as sunlight passes through the blades of an operational wind turbine. This tends to occur during winter when the sun's altitude is lower but can also be experienced close to sunrise and sunset. This effect only occurs during sunny periods when the turbine is also operational.

The impact of shadow flicker is affected by the distance of a viewer from the turbine in question. The intensity of the shadows cast by the turbine decreases and the distance increases and it follows that the intensity of any flickering will also decrease. This is due to a larger proportion of visible disc of the sun being blocked as the blade passes across it (BERR, 2009). The effect of shadow flicker tends to dissipate at distances beyond 10 rotor diameters (DECC, 2011)

Although it has been alleged that shadow flicker causes or contributes to health effects, there is very little evidence to support this claim. Modern wind turbines operate at frequencies of around 1 Hertz or less. In this case 1 Hz would mean 1 blade pass across the sun per second. This frequency is outside of the range that most people with photosensitive epilepsy are sensitive to (16-25 Hz), according to the Epilepsy Society (2012).

The main concern around shadow flicker is as a source of annoyance at surrounding residential dwellings and other sensitive receiver locations. This was the finding of NHMRC (2015) which found one study with a high risk of bias that found people who lived with 5 kilometres of a wind farm were more likely to be annoyed by shadow flicker than those who lived 5-10 kilometres away. It also found no studies that assessed the health effects of shadow flicker or other visual stimuli from wind farms.

4.3.1 Viewpoints and Sensitive Receivers/ Cultural Receptor

All POI were assessed and of these, one sensitive receiver (Bonnie Downs Station Homestead) and one cultural receptor (VIA_B) locations were identified (bolded in Table 28):

1 Bonney Downs Station Homestead near the corner of Marble Bar Road, Bonney Downs-Warrie Road and Bonney Downs-Hillside Road. From here to the nearest turbine is 2.5 kilometres (Plate 71).

2 VIA_B (in proximity to Bonnie Pool). VIA_B is located approximately 450 m east of Bonnie Pool and is approximately 1.6 kilometres from the nearest turbine. Bonnie Pool is a publicly accessible body of water and a known camping location for Traditional Owners (Plate 72).

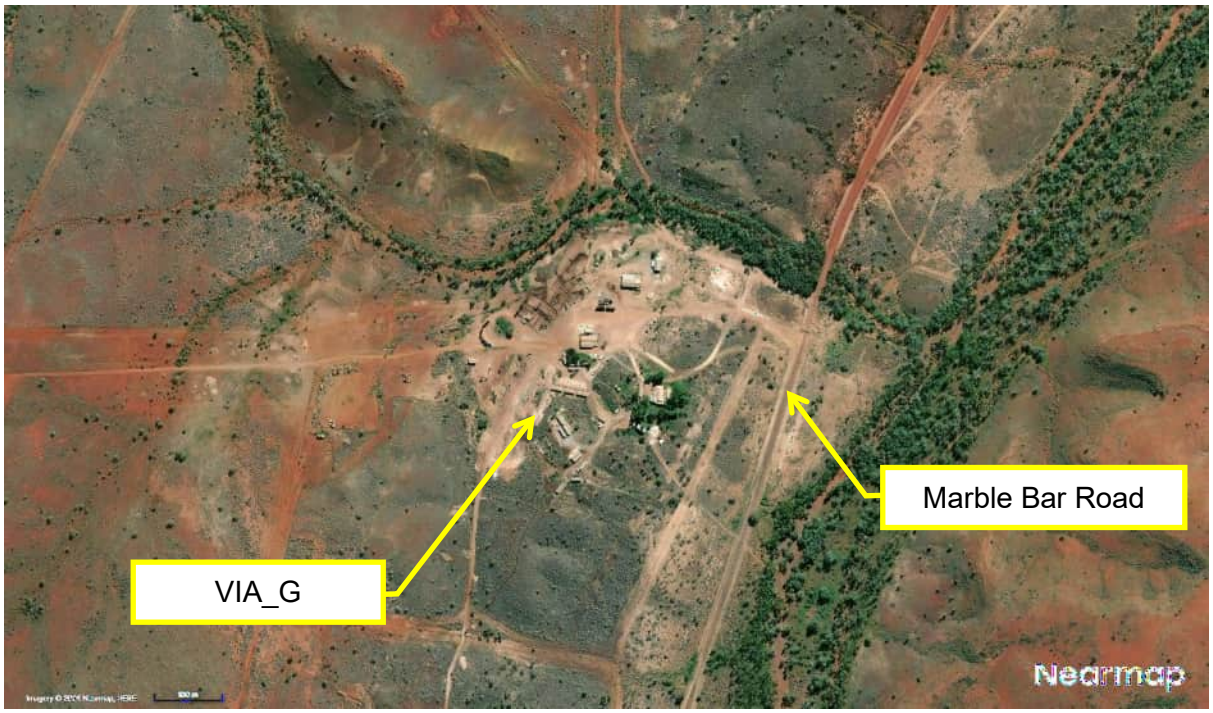

Plate 71: Bonney Downs Station Homestead (Nearmap 2024)

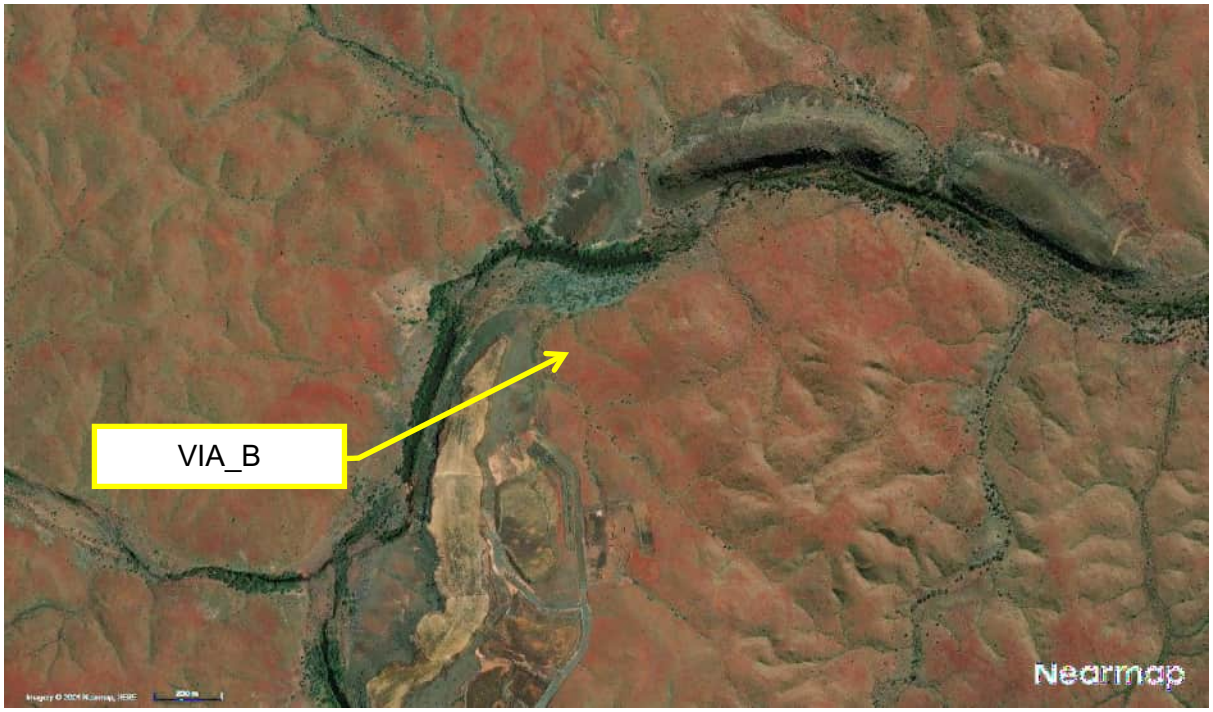

Plate 72: VIA_B (near Bonnie Pool) (Nearmap 2024)

4.3.2 Results

WindPRO gives a number of result output options including minutes per day and days per year with shadows. This assessment will focus on the hours per year and the results are summarised in Table 28. It should be noted that limits for shadow flicker only apply at the windows of residential dwellings. SLR has included all of the VIA locations but the results at most of these locations can generally be excluded.

Table 28: Shadow Flicker Results

POI	Description	Shadow Flicker (hours / year)	
		Worst Case	Expected Case
VIA_A	16 kilometres west of Nullagine	0	0
VIA_B	**Approximately 450 m east of Bonnie Pool**	**8:52**	**6:49**
VIA_C	Hillside Station	0	0
VIA_D	Bonney Downs – Hillside Road	34:36	26:47
VIA_E	Close to Bonney Downs Station Homestead	65:06	50:22
VIA_F	Main Road – Marble Bar Road	0	0
VIA_G	**Bonney Downs Homestead**	**0**	**0**
VIA_H	Bonney Downs – Noreena Road	0	0
VIA_I	Main Road – Marble Bar Road	0	0
VIA_J	Close to Bonney Downs Station Homestead	63:00	48:23
VIA_K	Nullagine Mine Haul Road (Nyiyaparli Native Title)	0	0
VIA_L	Nullagine Mine Haul Road (Nyiyaparli Native Title)	0	0
VIA_M	Nullagine River	0	0

As seen in Table 28, even in a worst-case scenario there is not expected to be any shadow flicker at the Bonney Downs Homestead and VIA_B is only predicted to experience 8 hours and 52 minutes of shadow flicker which is well below the limit of 30 hours (refer Section 3.7.1). This occurs between the times of 5:30 and 6:30 pm in the first half of February and around the end of October and the start of November.

The “Expected” shadow hours per year were also calculated which take into account the sunshine probability on a month by month basis. This results in a roughly 30% reduction in the number of shadow hours experienced per year at each of the locations. The results of this can be seen in Table 28. As with the worst case scenario, there is no shadow flicker at the Homestead and the amount at VIA_B is reduced to 6 hours and 49 minutes.

The worst case output contours for VIA_B and the surrounding area are shown in Plate 73, the results across all POI can be found in Appendix A.

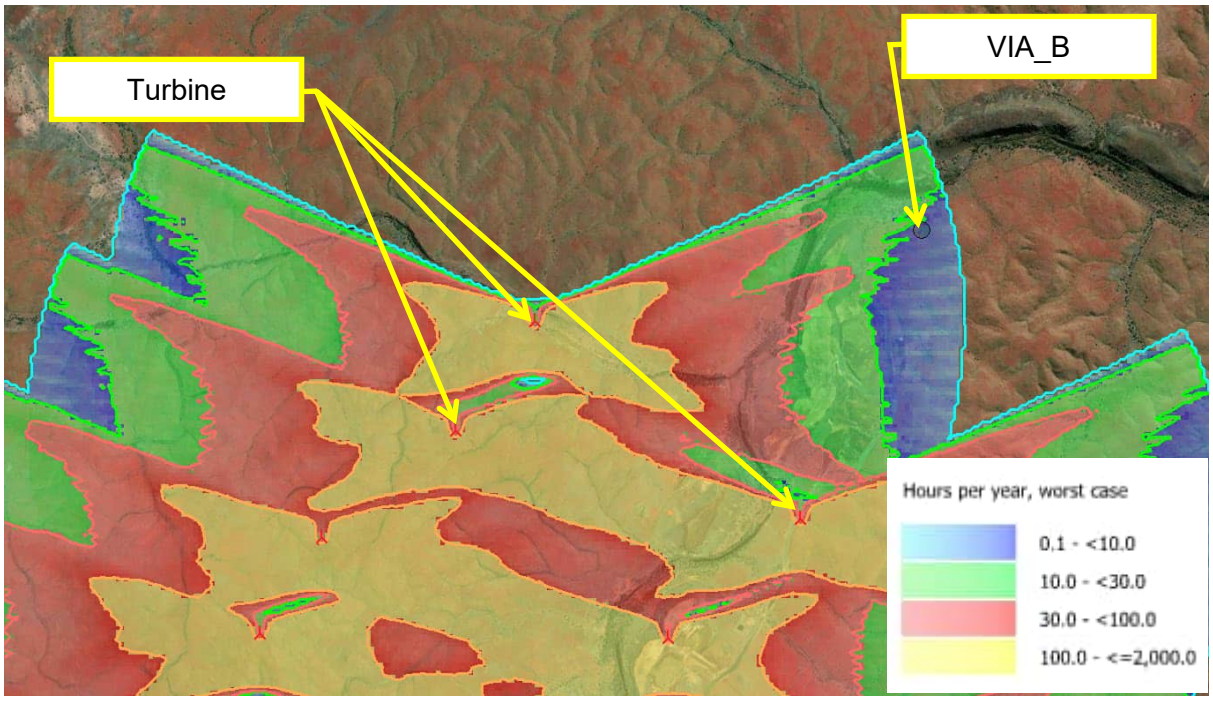

Plate 73: Shadow Flick Hours Per Year (Worst Case) – VIA_B (near Bonnie Pool)

4.4 Night-time Light Assessment

A night-time light assessment was conducted to evaluate site lighting and potential light spill in relation to the surrounding environment. The assessment considers relevant standards, including AS 1158 for lighting and signage, and AS 4282:2023 for light spill impacts, to ensure compliance and minimise potential effects on the surrounding landscape.

4.4.1 Lighting Terminology

A description of the common terminology used for the lighting study, taken from *AS 4282:2023 Control of the Obtrusive Effects of Outdoor Lighting,* is shown in Table 29**.**

Table 29: Lighting Terminology (Consistent with AS4282)

Term	Definition
Obtrusive light	Spill light which, because of quantitative, directional or spectral attributes in a given context, gives rise to annoyance, discomfort, distraction or a reduction in the ability to see essential information, e.g.: traffic lights.
Spill light	Light emitted by a lighting installation which falls outside the boundaries of the property on which the installation is sited.
Residential property	Land upon which a dwelling exists or may be developed, e.g.: land zoned for residential development.
Dwelling	A building in which people normally reside, especially during the hours of darkness, e.g. house, hotel, motel, hospital.
Illuminance	The luminous flux arriving at a surface divided by the area of the illuminated surface. Unit: lux(lx); 1 lx = 1 lm/m^2
Luminous intensity	The concentration of luminous flux emitted in a specific direction. Unit: candela (cd).

Term	Definition
Luminous flux	The measure of the quantity of light. For a lamp or luminaire it normally refers to the total light emitted irrespective of the directions in which it is distributed. Unit: lumen (lm).
Luminaire	Apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes, except for the lamps themselves, all the parts necessary for fixing and protecting the lamps and, where necessary circuit auxiliaries together with the means for connecting them to the electrical supply.
Glare	Condition of vision in which there is a discomfort or a reduction in the ability to see, or both, caused by an unsuitable distribution or range of luminance, or to extreme contrast in the field of vision Disability Glare – Glare that impairs the visibility of objects without necessarily causing discomfort. Discomfort Glare – Glare that causes discomfort without necessarily impairing the visibility of objects.

4.4.2 Light Spill Effects

The effect of light spill from outdoor lighting impacting on residents, transport users, transport signalling systems and astronomical observations is governed by the Australian Standard: *AS 4282-2023 Control of the Obtrusive Effect of Outdoor Lighting.*

The obtrusive effects of light spill are due both to an increase in general illuminance that can lead to sleep deprivation, and from the direct view of the light source that can cause glare issues.

The adverse effects of light spill from outdoor lighting are influenced by a number of factors:

- The topology of the area.
  - Light spill is more likely to be perceived as obtrusive if the lighting installation is located higher up than the observer. Lighting installations are usually directed towards the ground and an observer would hence have a direct view of the luminaire.
- The surrounding area.
  - Hills, trees, buildings, fences and general vegetation have a positive effect by shielding the observer from the light installation.
- Pre-existing lighting in the area.
  - Light from a particular light source is seen as less obtrusive if it is located in an area where the lighting levels are already high, e.g., in cities. The same lighting installation would be seen as far more bothersome in a dark residential area.
- The zoning of the area.
  - A residential area is seen as more sensitive compared to commercial areas where high lighting levels are seen as more acceptable.

Typical illuminance levels for a variety of circumstances are given in Table 30 for comparison.

Table 30: Typical Illuminance Levels for Various Scenarios

Lighting Scenario	Horizontal Illuminance (lux)
Moonless overcast night	0.0001
Quarter Moon	0.01
Full Moon	0.1
Twilight	10
Indoor office	300
Overcast day	1,000
Indirect sunlight clear day	10,000-20,000
Direct sunlight	100,000-130,000

4.4.3 Project Lighting and Requirements

4.4.3.1 Proposed Lighting

There is very little lighting expected to be used and SLR has taken a conservative approach and assumed that there will be some form of operational lighting at the base of each turbine. These may or may not be operational at night-time but will be assumed to be operational for this assessment. At a hub height of approximately 190 metres red flashing lights would also likely be required for aircraft safety.

4.4.3.2 Area Zoning

Initially the environmental zone of the site and surrounding area should be determined. This is defined in Table 3.1 of AS/NZS 4282-2023. The area of the Project Site is approximately 150 kilometres north of Newman and approximately 95 kilometres south of Marble Bar. There is very little around the site apart from one dwelling and several mines well to the south. In relation to AS/NZS 4282-2023, the relevant environmental zones for the area are considered to be:

- A1 (Dark) for relatively uninhabited areas.

4.4.3.3 Light Spill

The maximum recommended values of light technical parameters for the control of obtrusive lights are given in Table 31.

Table 31: **Recommended Maximum Values of Light Technical Parameters (AS4282:2023 Table 3.2)**

Light Technical Parameter	Time of Operation	Zone "A4"	Zone "A3"	Zone "A2"	Zone "A1"	Zone "A0"
Illuminance in vertical plane (E_v)	Pre-curfew hours	25 lx	10 lx	5 lx	2 lx	ALARP [2]
	Curfew hours [1]	5 lx	2 lx	1 lx	0.1 lx	0 lx
Luminous Intensity emitted by luminaires (I)	Pre-curfew hours	25,000 Cd	12,500 Cd	7,500 Cd	2,500 Cd	ALARP [2]
	Curfew hours [1]	2,500 Cd	2,500 Cd	1,000 Cd	500 Cd	0 Cd

Light Technical Parameter	Time of Operation	Zone "A4"	Zone "A3"	Zone "A2"	Zone "A1"	Zone "A0"
Zone A0	"Intrinsically Dark", e.g. UNESCO Starlight Reserve; IDA Dark Sky Parks; major optical observatories; no road lighting, unless specifically required by the relevant road controlling authority.					
Zone A1	"Dark", e.g. relatively uninhabited rural areas; no road lighting, unless specifically required by the relevant road controlling authority.					
Zone A2	"Low District Brightness", e.g. sparsely inhabited rural and semi-rural areas.					
Zone A3	"Medium District Brightness", e.g. suburban areas in towns and cities					
Zone A4	"High District Brightness", e.g. town and city centres and other commercial areas; residential areas abutting commercial areas					

Note 1 Curfew Hours = 11;00 pm to 6:00 am

Note 2 ALARP = as low as reasonably practical (as close to zero as possible)

Limits for luminous intensity for curfew hours apply in directions where views of bright surfaces of luminaires are likely to be troublesome to residents from positions where such views are likely to be maintained.

Limits for luminous intensity for pre-curfew hours apply to each luminaire in the principal plane, for all angles at and above the control direction.

The relevant limits in Table 3 are:

- Zone A1
  - 2 lux Pre-Curfew
  - 0.1 lux for Curfew times

The following guidance is relevant to the recommended illuminance limits:

- The vertical illuminance limits for curfew hours apply in the plane of the windows of habitable rooms or dwellings on nearby residential properties when they are less than 10 metres from the property boundary.
  - This refers to windows looking out toward the site as opposed to a horizontal measurement, which would be parallel to the ground looking up.
  - If the facades are more than 10 metres from the boundary, the vertical illuminance limits will apply at that 10 metre line, facing toward the site.
- The vertical illuminance criteria for pre-curfew hours apply at the boundary of nearby residential properties in a vertical plane parallel to the boundary.
  - Values given are for the direct component of illuminance, i.e. no reflected light is considered.

4.4.4 Sensitive Receptors

The key sensitive receiver locations are Bonney Downs Station Homestead and VIA_B (near Bonnie Pool) further described in Section 4.3.1.

4.4.5 Night-time Light Spill Analysis

4.4.5.1 Operational Lights

A conservative approach has been taken with the light expected to be operational at night-time. As the nighttime impacts are being assessed, the curfew limits will be applied.

The following has been assumed:

- Areas that may require lighting are the base of each mast.
- Lighting will likely be attached to the mast and directed downward to illuminate any required areas.
- The mounting heights for any lights are expected to range between 4 m and 6 m.
- The maximum luminous intensity for any lighting fixture will be less than or equal to 500 Cd as per Table 3.
- As the dwellings are more than 10 metres from the boundary, this 10 metre line will be used for the assessment.

On the basis of the above, it is SLR's opinion that:

- Due to the minimal amount of lighting expected to be present on the Project Site and the large distances involved, there is negligible to nil risk of any light spill above the critical 0.1 lux limit at the assessment line defined above and the nearest surrounding sensitive receivers.

4.4.5.2 Aircraft Lighting

A red flashing light may be required on top of the turbine nacelle for aircraft safety, the exact specification would be determined in conjunction with the Civil Aviation Safety Authority (CASA). There are four airports around the project site:

- Fortescue Dave Forrest Airport
- Christmas Creek Airport
- Ginbata Airport
- Noreena Downs Airport

The closest of these to any turbine is Christmas Creek Airport at 24 kilometres. Due to their elevated position on top of the nacelle these lights may be able to be viewed from the identified sensitive receiver locations. However, any illuminance from these would be well below the critical 0.1 lux limit.

5.0 Discussion

5.1 Landscape Impacts

Based on the results of the desktop and field assessments, a total of five LCUs were identified. Landscape value and impact for the LCUs were determined to be:

- Plains – medium value and minor-moderate impact
- Ranges, hills and low rises – medium value and minor-moderate impact
- Major waterways and drainage lines – high value and minor-moderate impact

- Mining and infrastructure – low value and no impact
- Townsites and residential – high value and no impact.

Overall, the impact of the Project on landscape character within the Study Area is predicted to be minor-moderate. The natural LCUs occur widely outside the Study Area, and the actual impact from a broad LCU perspective is not considered to be significant.

5.2 Visual Impacts to Points of Interest

Thirteen POIs were provided by Fortescue for assessment. The 13 POIs were visited during the field assessment. These POIs were then further assessed to evaluate the potential visual impact of the Project. Table 32 provides a summary of the visual impact assessment, POI without visibility of the Project are bolded.

Table 32: Summary of Visual Impact Ratings

POI	POI Sensitivity	Magnitude of Change	Impact Rating
VIA_A	Medium	Moderate	Moderate
VIA_B	High	Moderate	Moderate-high
VIA_C	Medium	Moderate	Moderate
VIA_D	Medium	Moderate	Moderate
VIA_E	Medium	Moderate	Moderate
VIA_F	Medium	Low	Minor-moderate
VIA_G	High	Moderate	Moderate-high
VIA_H	Medium	Negligible	Minor
VIA_I	Medium	Moderate	Moderate
VIA_J	Medium	Moderate	Moderate
VIA_K	Medium	Negligible	Minor
VIA_L	Medium	Low	Minor-moderate
VIA_M	**High**	**None**	**None**

Twelve of the 13 POIs were predicted to have visibility of the Project, POI VIA_M was not predicted to have visibility of the Project and is therefore expected to have no impact. Implementation of the Project is predicted to result in a minor to moderate impact to 10 of the assessed POIs surrounding the Project and two POIs (VIA_B and VIA_G) are expected to have a Moderate-high impact.

The results indicate that the alteration to visual amenity will be widespread due to a combination of the quantity of the turbines, height of the turbines, typically low lying vegetation and expanses of flat topography surrounding the Project. Higher impact ratings were assigned where the Project introduced a new element into the view of the landscape or visibility of the turbines was high and wide-ranging, altering the character of the view. This was common due to the remoteness of the Project location and the absence of existing modified features in the landscape. Factors affecting the degree of visual impact include the distance from the POI to the turbines/transmission line and the accessibility of the POI:

- Turbines were located no closer than the midground (2 km, based on visibility zones defined by NSW Planning and Environment (2016)) for 7 of the 13 POIs notably at Bonney Downs Station Homestead (VIA_G), all POI along Marble Bar Road (VIA_F

and VIA_I) and the VIA_M at Nullagine River. POI with turbines in the foreground (0 km to 2 km) included VIA_A, VIA_B, VIA_J, VIA_E, VIA_D. The visual impact at these POIs is, therefore, much greater than at POIs where the Project is in the background.

- VIA_F, VIA_G and VIA_I are the most publicly accessible and visited POIs, being located on a main road (Marble Bar Road). The public accessibility results in a higher impact rating relative to other sites that are less readily accessible by the public.

The placement of the turbines within the landscape will affect the existing visual character of the area, particularly where the Project is within the foreground to mid-ground of the POI. However, at all POI the natural landscape remains dominant.

The project does not result in the alteration or disruption to valued landscape characteristics, including heritage sites, rivers and major waterways, or ranges. These key features remain physically unaffected and largely visually unaffected.

During the construction phase of the Project, visual impacts are temporary and predominantly associated with dust. High dust levels may result in haze, reducing the visibility of environmental values in the landscape. GHG (2024) conducted air dispersion modelling to assess the potential impacts of the construction and operational phase of the Project. The results indicate that the Project complies with relevant air quality criteria for dust deposition in all scenarios except at certain locations when constructing five turbines simultaneously with and without management measures. The construction phase of the Project is not anticipated to result in additional visual impacts that would elevate the overall visual impact rating. This is due to the distance of the POIs from the Project.

Assuming the Project is decommissioned and removed, the visual impact of the Project will diminish relatively quickly (in relation to the project's proposed operational life), with removal of the turbines and transmission line. Any ground disturbance associated with the Project will be rehabilitated, which will be a gradual process over time as vegetation becomes re-established. Once revegetation is complete and successful, there should be no significant changes to the visual landscape.

5.3 Shadow Flicker Impacts

The modelling assessment of the shadow flicker evaluated the worst case and expected shadow flicker from the 200 proposed wind turbines with respect to 13 viewer locations, two of which have been identified as or near sensitive receivers. The output showed that there would be no shadow flicker experienced at the Bonney Downs Station Homestead and in a worst-case scenario there would be 8 hours and 52 minutes of shadow flicker at VIA_B viewer location which is well below the limit of 30 hour per year which would occur in the late evening during the first half of February and end of October/start of November. Once the probable sunshine hours are taken into account this drops to 6 hours and 49 minutes.

5.4 Light Spill Impacts

Minimal operational lighting is required on-site, assumed primarily to be at the base of each mast with downward-directed fixtures mounted at 4 to 6 m and a maximum luminous intensity of 500 candela. The night-time light assessment indicated that, given the large distances to sensitive receivers and the use of a 10 m assessment boundary, there is negligible to nil risk of exceeding the 0.1 lux light spill limit. Red flashing lights on turbine nacelles, required for aviation safety in consultation with the Civil Aviation Safety Authority, may be visible from sensitive receptors and POIs however any illuminance from these would be well below the critical 0.1 lux limit.

5.5 Cumulative Impacts

The Project is currently isolated from other wind farm projects.

The Project forms part of Fortescue's decarbonisation pathway, intended to support Christmas Creek Mine and Nullagine Mine and as such is not isolated from other mining and infrastructure. The Mining and Infrastructure LCU is somewhat rare within the Study Area (6.1%), with the implementation of the Project resulting in an increase of approximately 1%. Implementation of the Project is not expected to result in a significant cumulative change in the valued landscape. Views of both the Project and Nullagine Mine are expected, as shown in the photomontages for VIA_B (provided in section 4.2.2), the waste rock dump sits alongside and in front of wind turbines.

5.6 Conclusion

Overall, implementation of the Project was predicted to have a minor to moderate-high visual impact due to visibility at twelve of the 13 assessed POIs as a result of the quantity of turbines, the height of the turbines, typically low lying vegetation and low undulating topography surrounding the Project. One POI is expected to have no impact, and two POIs are expected to have a Moderate-high impact. The Project is considered likely to meet the project-specific VMOs due to the following:

- The Project does not result in a dominant change in view for the POI that are located > 1 km from the Project, nor for POI < 1 km from the Project.
- The Project does not result in the removal of valued characteristics, such as major waterways or isolated rounded hills. Nor does it result in significant alteration or disruption to views of these.
- Turbines are visually apparent within the visual catchment area, the area within which the Project can be seen at eye level above ground, and in some views are a major element however the natural landscape remains the dominant characteristic.

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Appendix A Shadow Flicker Results

Visual Impact Assessment

Bonney Downs Wind Farm

Fortescue

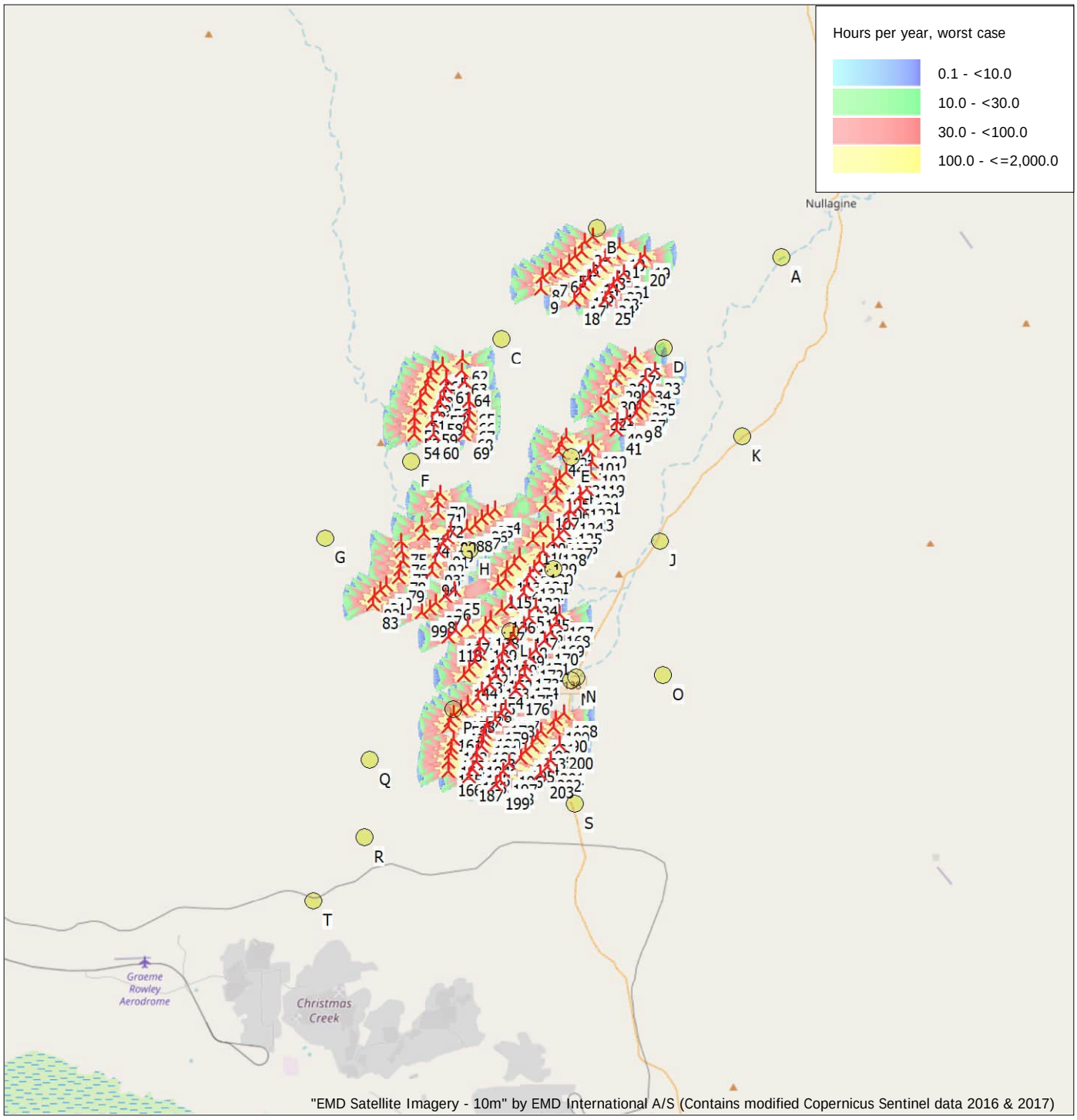
SLR Project No.: 675.072721.00001

13 June 2025

Licensed user:
SLR Consulting
202 Submarine School, Sub Base Platypus,
AU-2060 North Sydney
0400961774
Peter Hayman / phayman@slrconsulting.com
Calculated:
24-Oct-2024 8:13 PM/4.1.254

SHADOW - Map

Calculation: Baseline Shadow Flicker



0 5 10 15 20 km

Map: EMD OpenStreetMap , Print scale 1:400,000, Map center Geo WGS84 East: 119.918549° E North: -22.103481° N

New WTG Shadow receptor

Flicker map level: Elevation Grid Data Object: Bonney Downs_EMDGrid_8.wpg (9)

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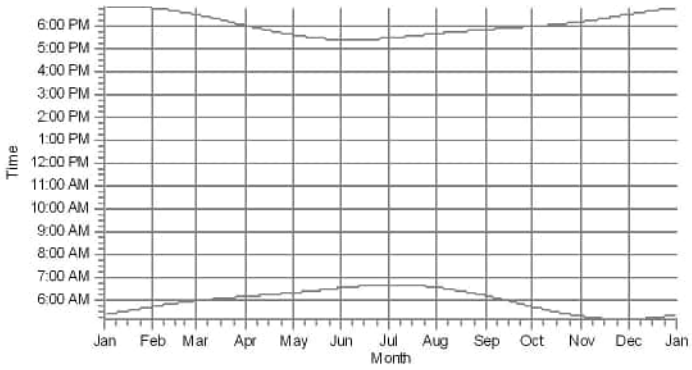
AU-2060 North Sydney
0400961774
Peter Hayman / phayman@slrconsulting.com
Calculated:
24-Oct-2024 8:13 PM/4.1.254

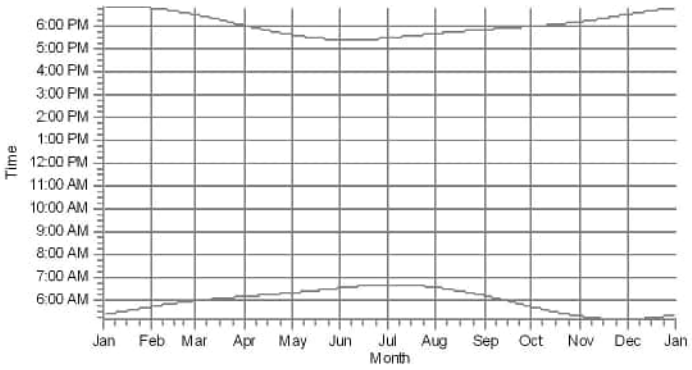
SHADOW - Calendar, graphical

Calculation: Baseline Shadow Flicker

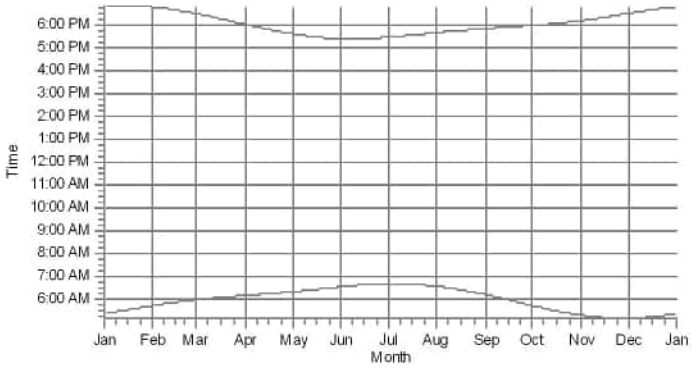
A: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (1)



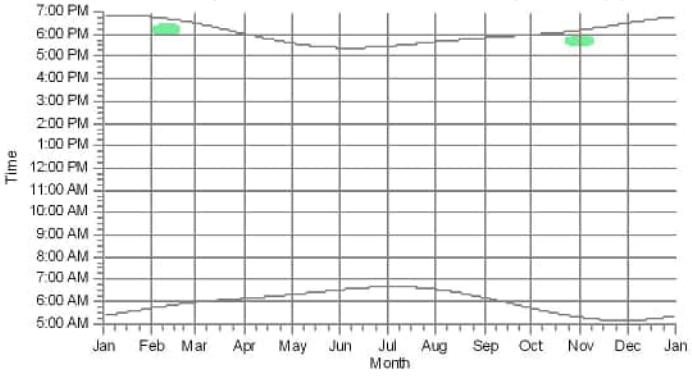
B: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (2)



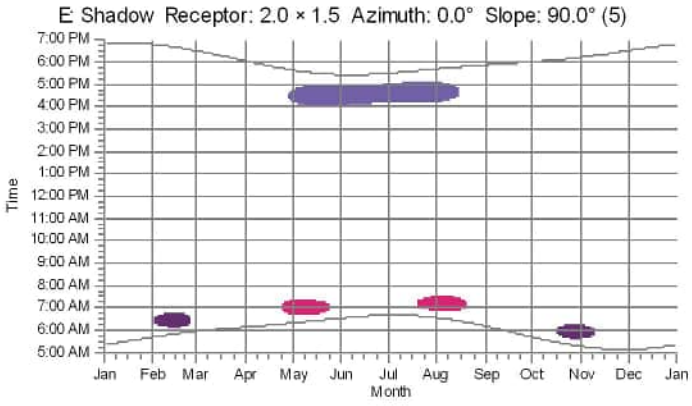
C: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (3)



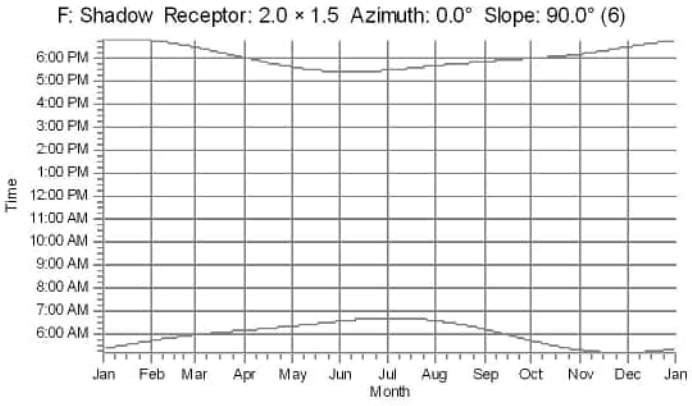
D: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (4)



E: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (5)



F: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (6)



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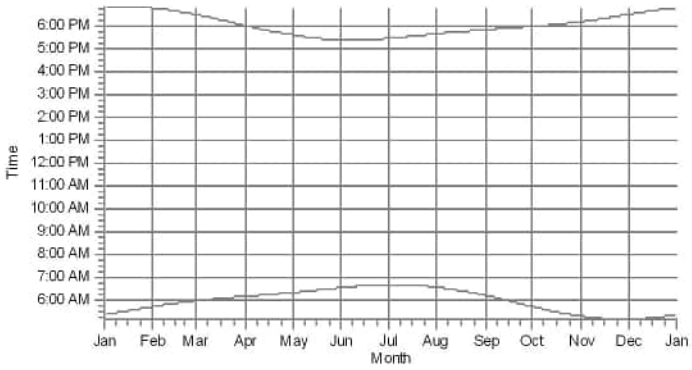
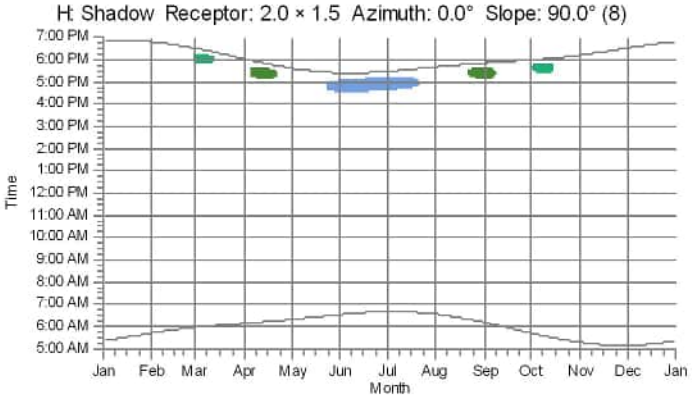
SHADOW - Calendar, graphical

Calculation: Baseline Shadow Flicker

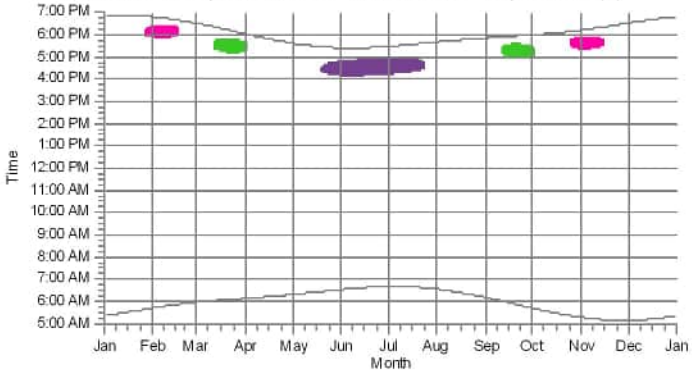
G: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (7)



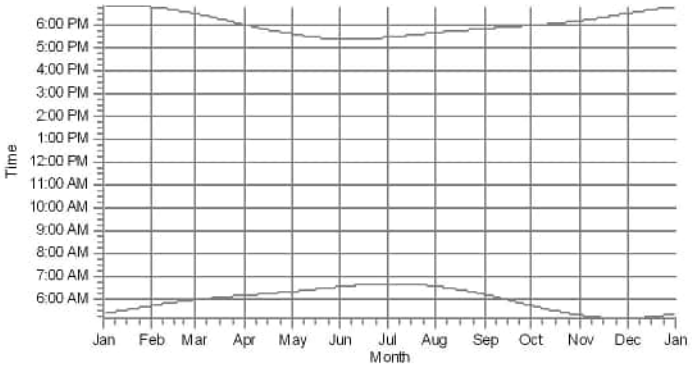
H: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (8)



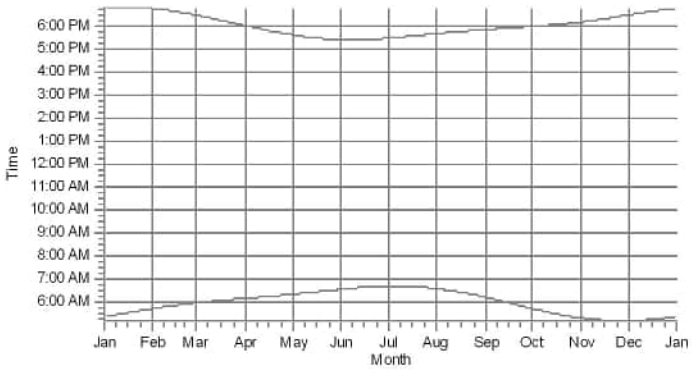
I: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (9)



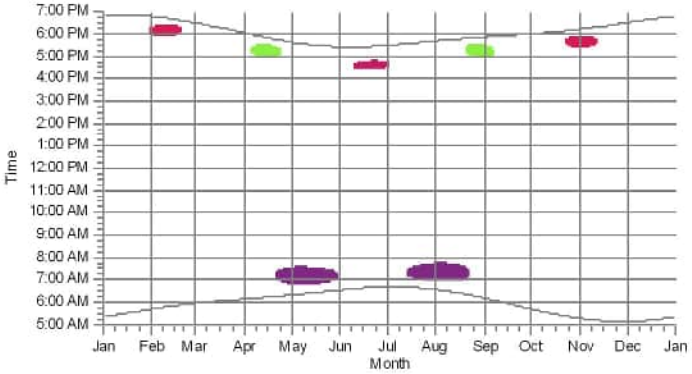
J: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (10)



K: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (11)



L: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (12)



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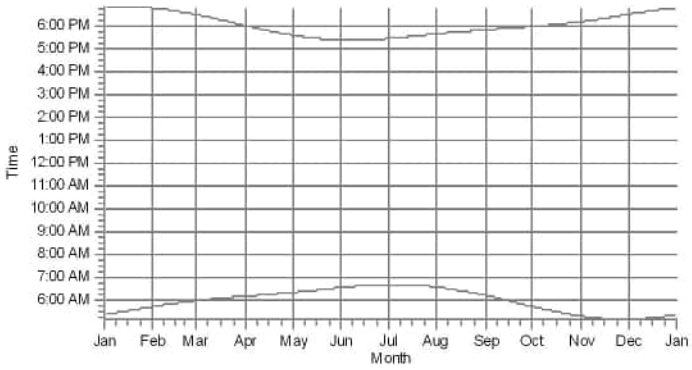
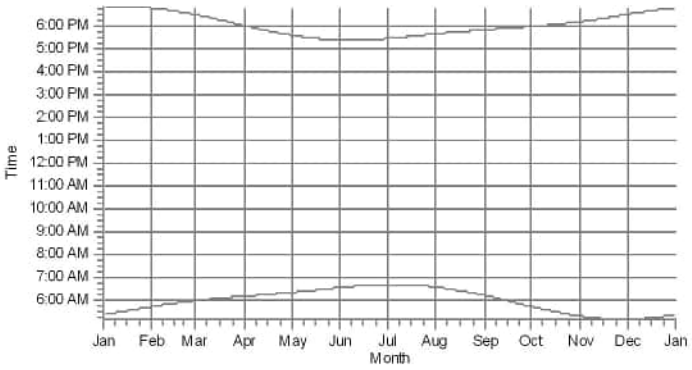
SHADOW - Calendar, graphical

Calculation: Baseline Shadow Flicker

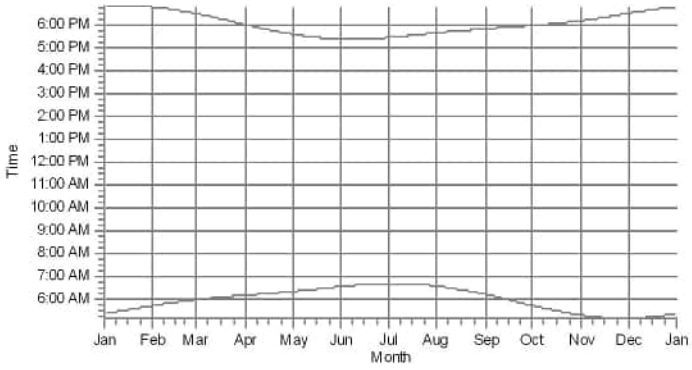
M: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (13)



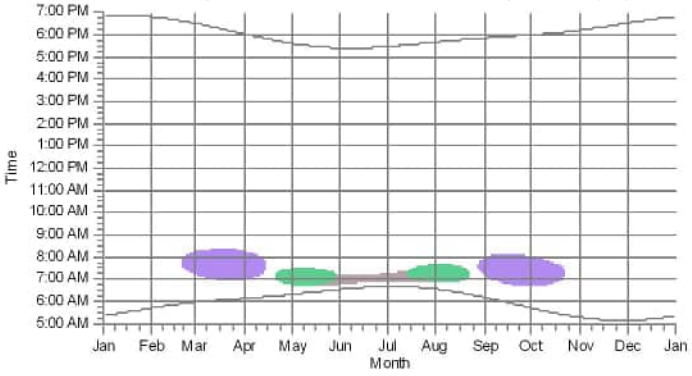
N: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (14)



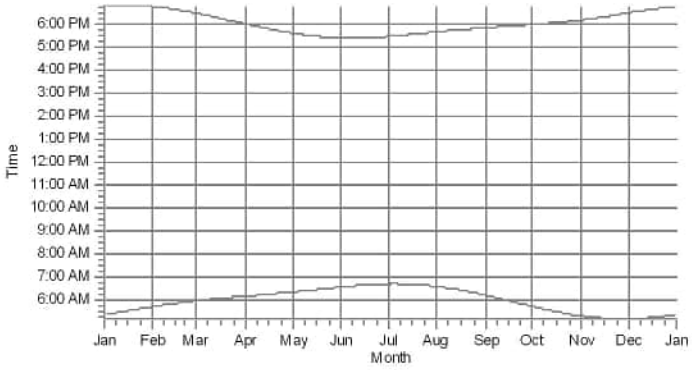
O: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (15)



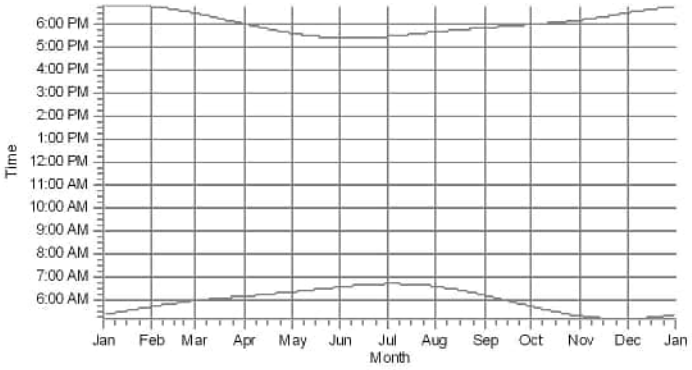
P: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (16)



Q: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (17)



R: Shadow Receptor: 2.0 × 1.5 Azimuth: 0.0° Slope: 90.0° (18)



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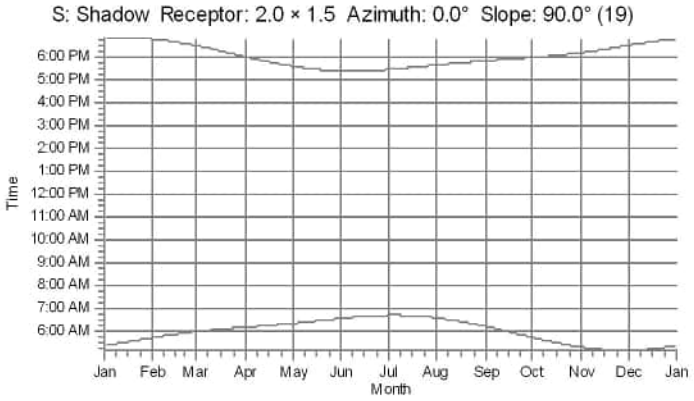

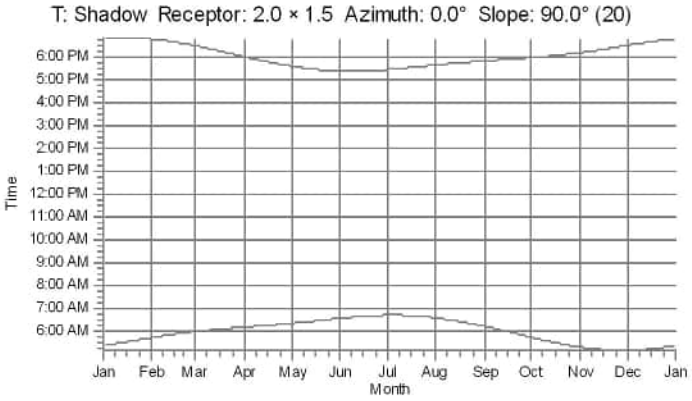

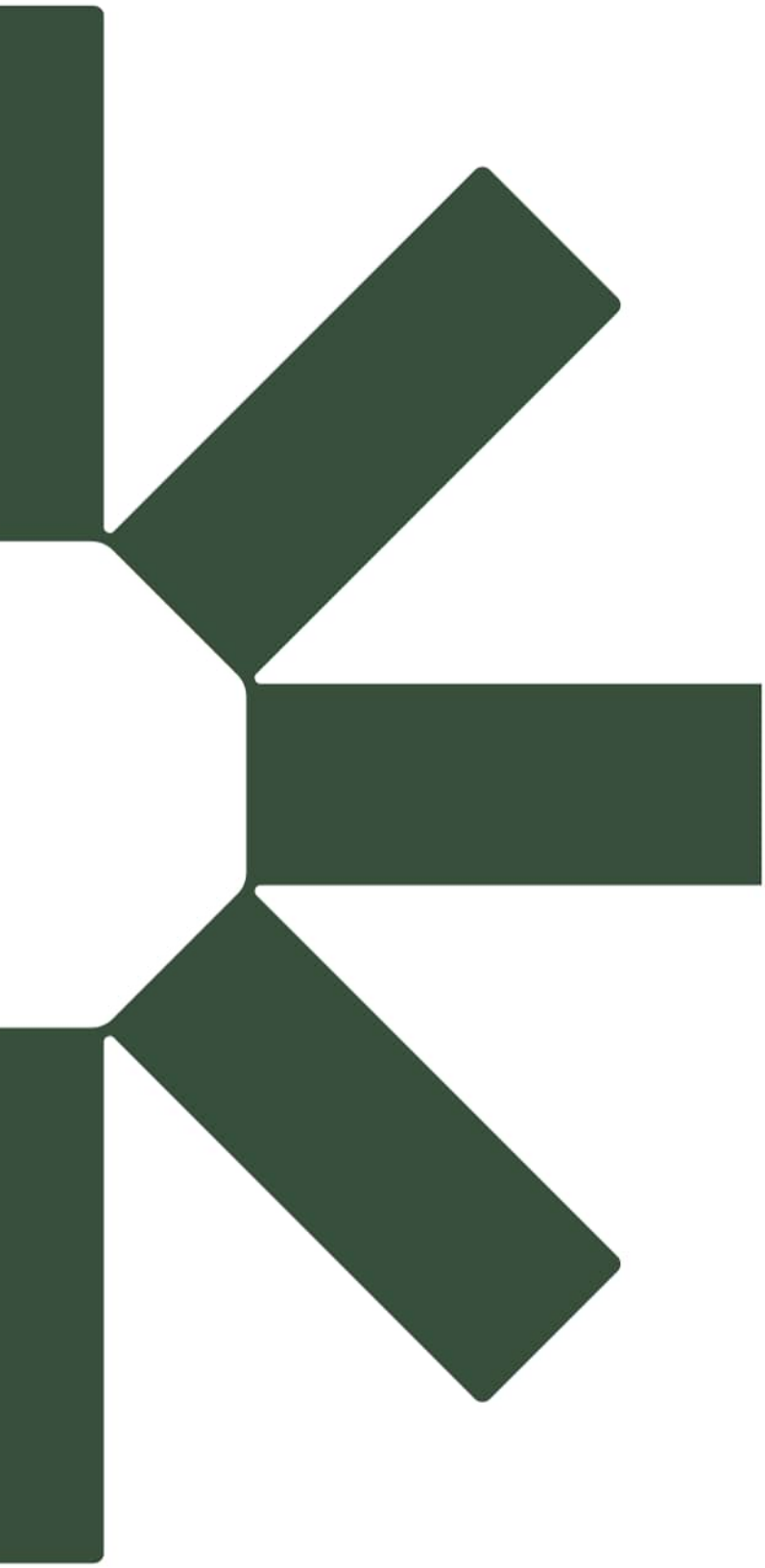

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