

KING ROCKS WIND FARM VISUAL IMPACT ASSESSMENT

PREPARED FOR
SYNERGY RED
JULY 2022

PHOTO: ASCENT TO KING ROCK PEAK

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1.0 INTRODUCTION

1.1 VIA SUMMARY

1.1.1 BACKGROUND

Urbis was commissioned by SynergyRED to conduct a visual impact assessment of the proposed King Rocks Wind Farm development. The wind farm, is to be constructed approximately 350 km east of Perth within the Shire of Kondinin. The site is located approximately 35 kilometres north east of the Hyden townsite in the Western Australian Wheatbelt.

The report examines the landscape character of the study area and the visual impact of the proposed development on the surrounding context.

SynergyRED's Development Application comprises the installation of 30 wind turbines with up to 7.2MW each (total capacity 150MW) across the site (refer to Figure 12 for site context map). Each wind turbine will be up to 240m tall (150m tower + 90m tip height = 240m). This proposal constitutes the maximum potential project requirement for turbines to ensure the visual impact assessment captures a 'maximum case scenario' and any potential impacts.

The final make and model of the turbines which comprise the wind farm is not yet finalised and would be subject commercial and procurement processes following approval of the project.

The project will have a number of ancillary features, including associated electricity transformers, underground cabling, access tracks, crane hardstands, a substation compound including a metering building, site office and workshop and a communications masts (up to 2), a transmission system connecting to the grid, and free-standing wind monitoring masts. Existing vegetation will be retained where possible.

The development land is zoned Rural under the Shire of Kondinin Local Planning Scheme No.1 (LPS 1). One of the key objectives for the Rural zone is "to consider non-rural uses where they can be shown to be of benefit to the district and not detrimental to the natural resources or the environment". Further, LPS 1 identifies visual amenity as an important consideration for the locality, therefore the VIA has been prepared in this context, in order to determine the visual impact of the proposal and how it will be managed. Refer: Figure 1_Location Plan.

1.1.2 VISUAL ASSESSMENT SCOPE

The visual impact assessment, including photomontages, is prepared from representative view points around the King Rocks site (the study area). This assessment will help to describe the likely visual change resulting from the proposed development.

Photomontages are required to demonstrate the impact of development under consideration. The photomontages examine the area affected by the proposed development, the appearance of the development from the surrounding context, and the resultant visual impacts.

The purpose of the report is to assess the potential visual impacts of the proposed development and identify any impacts requiring remediation.

1.1.3 DATA SET

Urbis obtained data from SynergyRED with respect to levels and proposed built form at the development site (both existing and proposed). Additionally Urbis sourced supporting GIS DATA to ensure that the data set is appropriate for the modelling exercise. The Data Set accurately illustrates the surrounding site context including topography/terrain, access roads, and built form.

Refer: Figure 2_GIS Dataset

While the model is suitable to undertake the review, it does not capture existing vegetation which may help to screen and development. As such the data set provides us with the expected viewshed and a reference showing the required viewing locations to assess on site.

Following review of the dataset Urbis selected 16 locational points within the study area from which the impact assessment should be undertaken. The identified points were selected from accessible public areas with the potential to be impacted.

Of the 16 locational points 9 prominent locations were selected for photomontage review to compare any visual impacts demonstrated by the 3D model with the on-site photography.

Additionally, to ensure concerns surrounding clarity are limited, photographic imagery was taken from each of the 16 viewing locations in order to ensure all impacts on the wider viewshed are taken into account.

1.1.4 VISUAL IMPACT ASSESSMENT OBJECTIVES

The visual impact assessment will help to determine whether the proposed Wind Farm development will create an impact on views from its surrounding context.

The objectives of this visual assessment are to:

- identify locations from where the view to the Proposed Wind Farm may be visible,
- assess the potential visual impacts from the identified locations, and
- propose solutions to help mitigate any identified impacts upon those identified viewing locations.

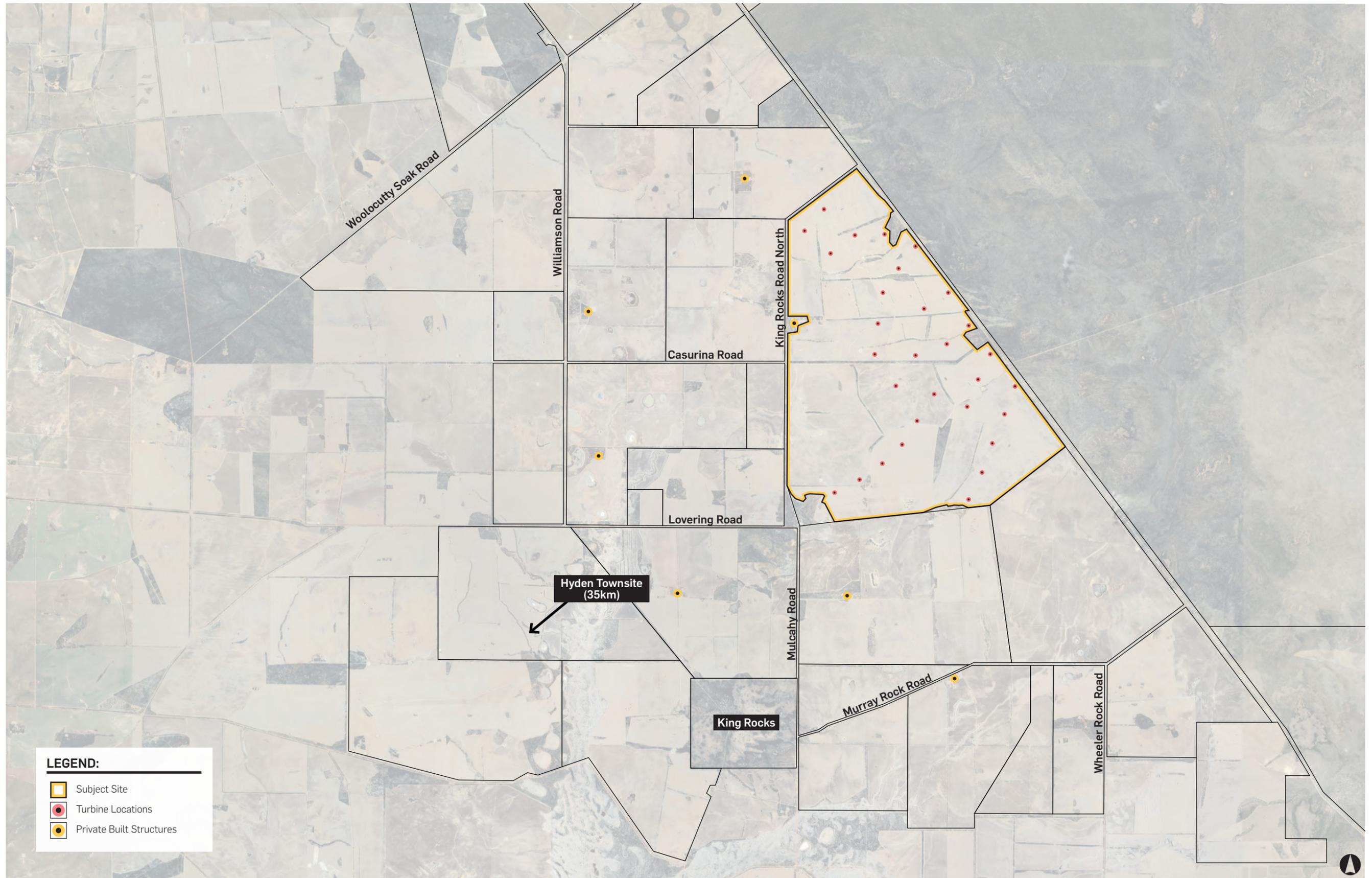
REPORT COMPLIANCE

The Western Australian Planning Commission develops state planning strategy responsible for conserving landscapes of aesthetic value to the community. The Department of Planning and the Western Australian Planning Commission have developed a manual for visual landscape evaluation and visual impact assessment. This manual contains guidelines for protecting landscape values when planning development.

The methodology used in this report was developed to comply with the Western Australian Planning Commission Visual Landscape Planning Manual (DPI 2007) with reference to the following.

- Best practice guidelines for implementation of wind energy projects in Australia (Auswind, 2006);
- WAPC – Planning Position Statement – Renewable Energy Facilities
- Kondinin Town Planning Scheme Number 1 (TPS1)

Figure 1 Project Site Location Plan



2.0 SITE CHARACTERISTICS

2.1 PROPOSED DEVELOPMENT

The proposed King Rocks Windfarm is located on the eastern boundary of the Town of Hyden. The development site is located within two rural farmland properties east of King Rocks Road North and bordering the Forrestania reserve. This rural farm land contains open expansive fields bordered by strips of roadside vegetation and remnant bushland reserves. The remnant vegetation in this area is typically mallee bushland species with a height range of up to 10m.

The proposed site entry road and internal access roads are of a modest scale, surrounded by existing remnant vegetation similar to other side roads in the vicinity.

The proposed facilities comprise the following:

- Wind Turbine Structures
- Electricity Transformers
- SubStation
- Wind Monitoring Masts
- Supporting Infrastructure Including Administration Offices,
- Access Roads

Visual elements

Design elements which have the potential to affect the surrounding landscape and its visual character for the proposed King Rocks wind farm include:

- Siting and layout of the wind farm;
- Design of the turbines, including rotor size, blade rotational speed, height, colour and reflectivity;
- Ancillary features including associated access roads, buildings, signage, telecommunications, infrastructure and transmission lines; and
- Construction procedures, including any temporary construction areas which are to be rehabilitated following construction.

2.1.1 STUDY AREA

- The study area identifies a radius of 20 km from the centre of the proposed development site, as shown in Figure 4. This radius was selected based on a desktop review of key potential viewing locations in the surrounding area with reference to the Western Australian Planning Commission's (WAPC) Visual Landscape Planning in Western Australia (WAPC, 2007) which states that wind farms should be encouraged to be more than 15 km away from major vantage points. 2 viewing locations beyond the study area were also reviewed due to their elevated view and potential for visitation by tourists.

2.1.2 SURROUNDING LANDSCAPE

The proposed development is located to the west of a bushland reserve and is surrounded by rural farmland.

The site is bounded by perimeter vegetation along King Rocks Road North and is divided by a corridor of retained vegetation that extends into the site from Casuarina road.

The view to the south and west are typically open while views from the north and east are enclosed by the retained bushland. The site is accessible on unsealed roads with a low traffic volume. The access roads that surround the site are bordered by vegetation typically up to 5 metres high and averaging around 5 to 10m wide.

Accessible views to the site contain a similar rural pasture-land landscape character.

To the south of the site the 'King Rocks' landform provides a high point providing views across the surrounding farmland towards the development area. This natural rock formation sits at approximately 400m AHD at its highest point and offers 360 degree views of the surrounding landscape. The rock itself is bare and is surrounded by dense remnant endemic vegetation, predominantly Mallee Eucalypts.

The Lake Liddelow Nature Reserve, is located south east of the proposed development site.

To the west, key landscape and cultural features including Mulkas Cave, The Humps, Gibb Rocks and Anderson Rocks.

Primary Tourist destinations within the Town of Hyden including Wave Rock and Hippos Yawn and further west the Hyden Town site are located more than 30kms from the development site. Our desktop study has shown that the development will not be visible from these locations due to topography.

2.1.3 NATURAL LANDFORM

The surrounding landforms within the Town of Hyden are rural plains dominated by granite peaks.

When viewed from the surrounding roads, the development site will be evident where there is no screening vegetation as it will not be contained by landform.

2.1.4 LIGHT

Evening lighting creates a visual change which needs to be considered, even when viewed from distant vantage points.

Night time lighting of structure for aviation safety is not anticipated for this project. Some project infrastructure, including turbine stairs, buildings and substation will contain lighting only as required for operational safety purposes.

SynergyRED will undertake a risk assessment to determine the level of aviation safety risk and any mitigation measures required.

Direct light spill caused by Light luminance levels at the western most extent of the proposed new infrastructure, is expected to be limited and will be further mitigated by retained corridor vegetation.

2.1.5 SITE DEVELOPMENT STAGING

The construction phase of the of the project will occur over approximately 24 months and will contain additional lighting during construction activities as required during levels of low natural light for safety.

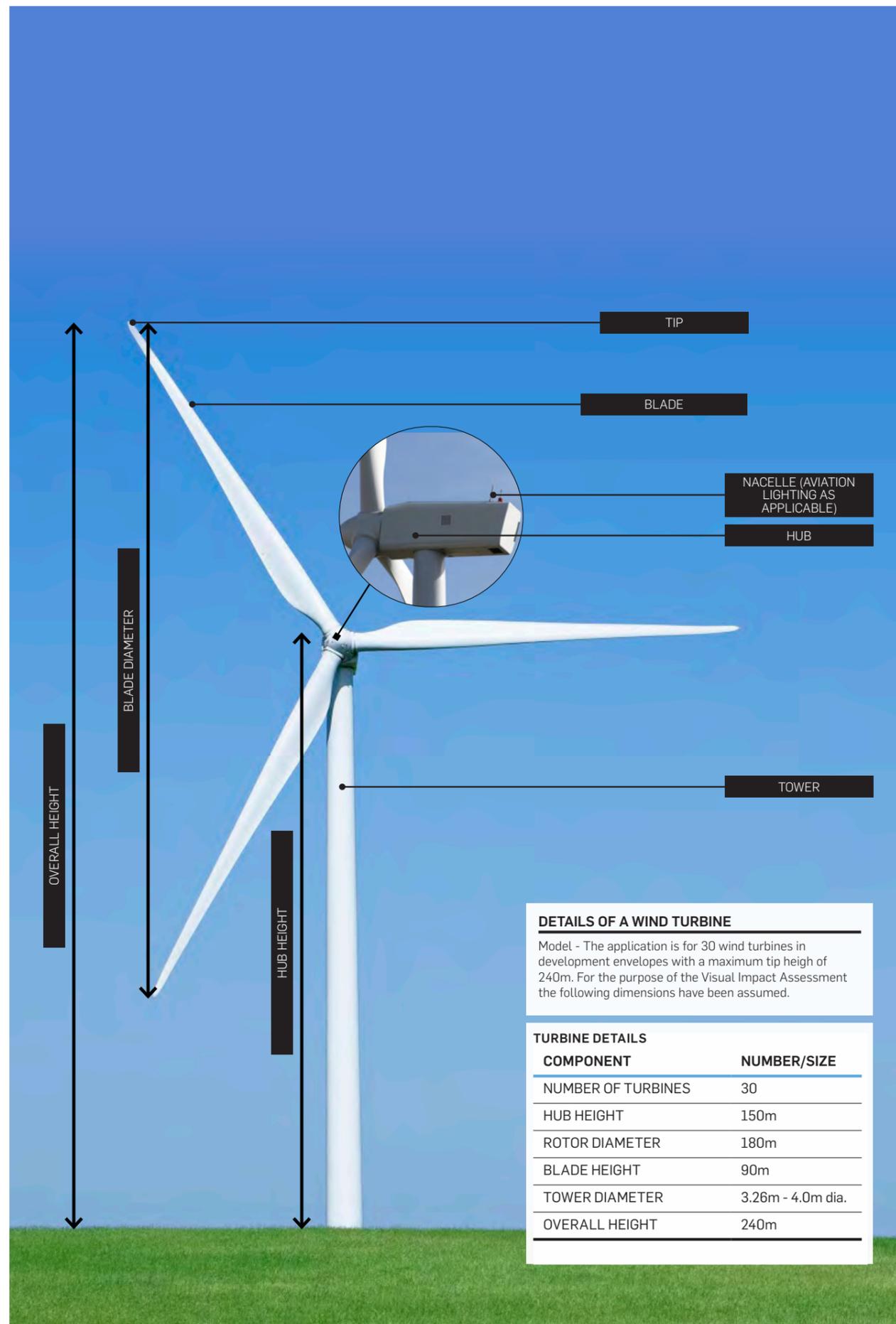


Figure 2 Turbine Structure Details

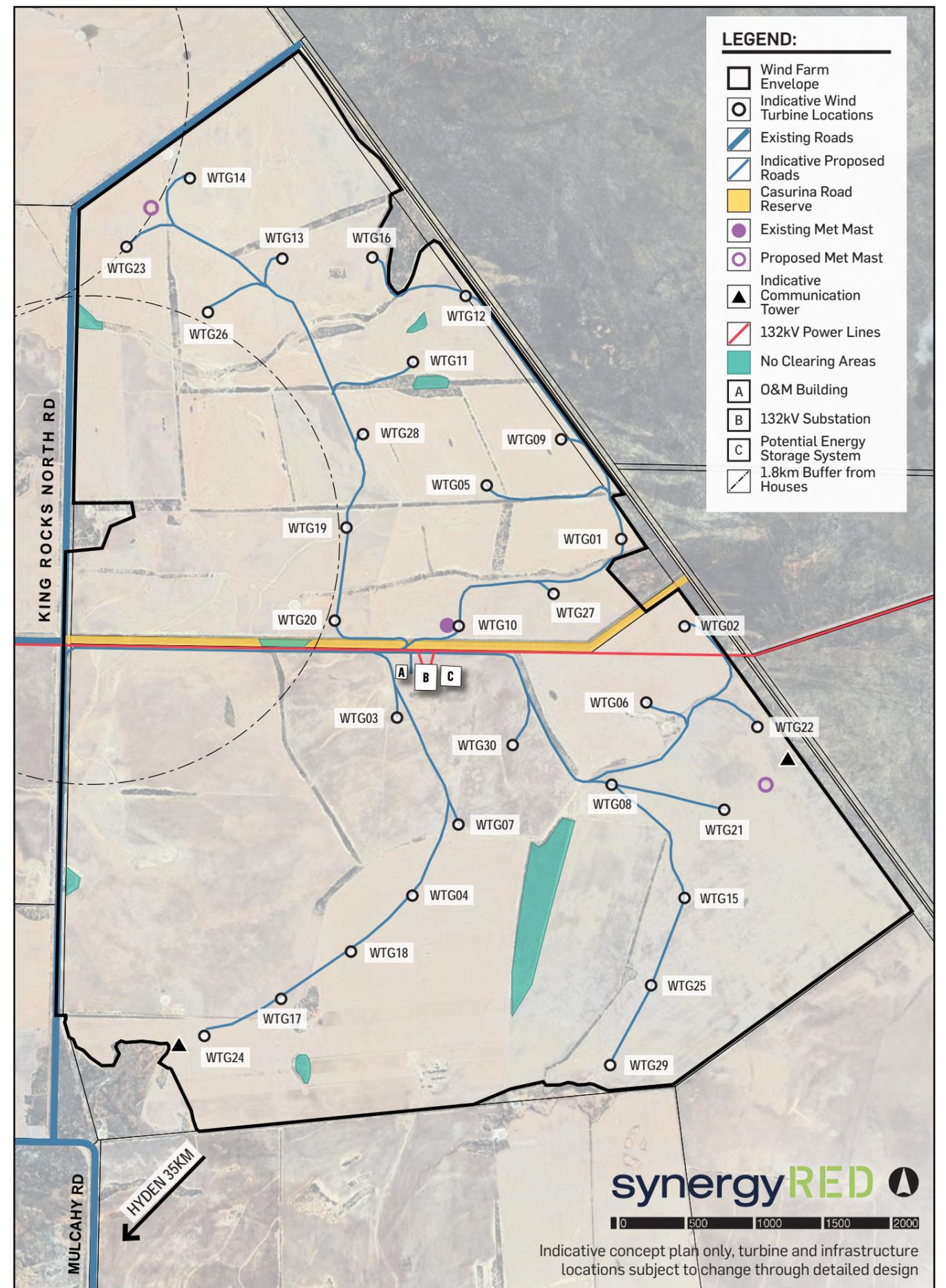


Figure 3 Project Site Context Plan - Proposed Turbine Locations

3.0 ASSESSMENT METHODOLOGY

3.1 METHODOLOGY

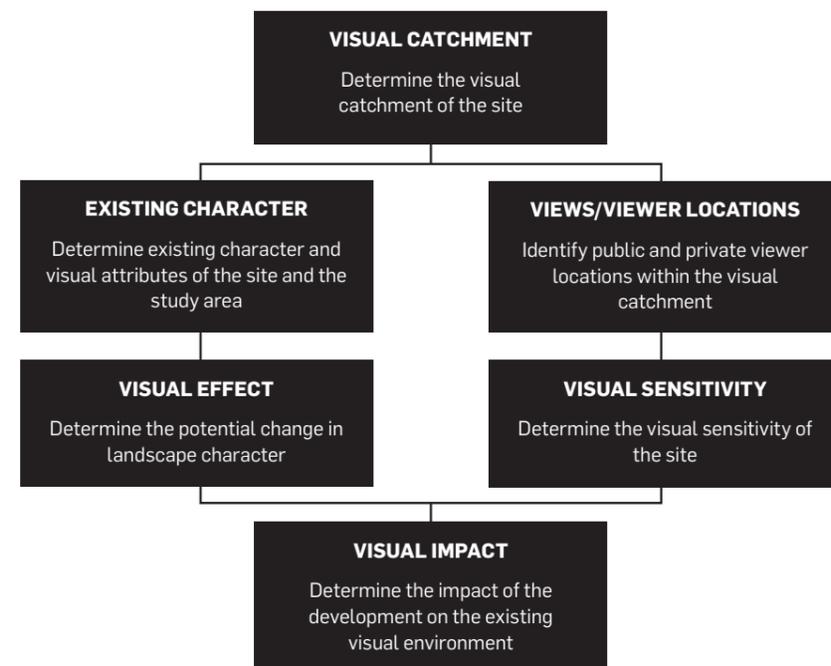
3.1.1 VISUAL LANDSCAPE PLANNING IN WESTERN AUSTRALIA

This report uses a well-recognised approach to visual quality assessment that is systematic, consistent and based on professional value judgement of commonly adopted and accepted criteria. This approach has been developed from the Western Australian Planning Commission Visual Landscape Planning in Western Australia Manual (DPI 2007).

The visual impact of the proposed development at King Rocks Road North, Hyden is determined by evaluating the visual effect of the development in the context of the visual sensitivity of the surrounding areas that it is visible from.

Urbis conducted a desktop data review to provide an assessment of the landscape character and undertook a site visit to examine the viewing focal point, key vantage points from the surrounding context and take photographs to assist with the preparation of the photomontages.

The following chart describes the visual assessment methodology undertaken for this project:



3.1.2 VISUAL CATCHMENT

The visual catchment of a site is the extent of the landscape that can be viewed from the site and likewise the extent of locations from which the site can be seen.

Vegetation, land use and landform play key roles in determining visual catchment. For example, where a development is surrounded by vegetation, the visual catchment is likely to be significantly restricted. Conversely, open roads and elevated areas do not create the same impediment to views.

The visual catchment for the project area was approximated by desktop analysis. This was reviewed on site to ascertain the influences of the surrounding vegetation and landform.

Refer: Figure 3_Extent of Visual Assessment Study Area.

The visual catchment of the majority of the development open and unconstrained by the topography of the surrounding areas or existing vegetation.

Mid and distant views of the turbines are available from a variety of locations to the North south and west.

Views from the north along Woollocutty Road are occasionally obscured by the road corridor vegetation.

Distant views from the south include views from publicly accessible vantage points such as the The Humps, Gibb Rock and Anderson Rocks. The development proposal is likely to be barely discernible from these distant vantage points.

Views of the development will be clearly visible from King Rocks which is the primary elevated vantage point to the south.

Views from within the bushland reserve to the East of the development have not been assessed. These vantage points could not be verified within the scope of the study and were considered to be an infrequent vantage points. Additionally the dense vegetation in these areas would screen views to the turbines.

The impact of a view will be greatest where:

- the view is taken from elevated viewing areas;
- the development is highly exposed with little coverage;
- the development is viewed in the foreground; and,
- distance views are removed by the development.

3.1.3 VIEWS AND VIEWER LOCATIONS

Due to the open nature of the surrounding agricultural landscape on the site, the proposed development will have clear visibility from most public locations with a couple of key exceptions.

A viewshed 3D model was prepared using land contour information to illustrate the visibility of the site from potential viewing locations within the study area.

The viewshed 3D model does not account for screening from vegetation, buildings or other structures. This analysis identifies the areas where the site is visible from a viewing location.

Refer: Figure 4_Viewshed 3D Base Model.

From the visual catchment Urbis identified 16 viewing locations. The key viewer locations were selected within the study area and take into consideration key infrastructure(roads), potential tourist destinations, housing and culturally-significant places. The viewpoints were limited to publicly accessible areas and places at elevation that present a view towards the site.

A site visit to validate the results of the desktop study and viewshed analysis was conducted on March 23 to 24, 2022. The objectives of the visit were to:

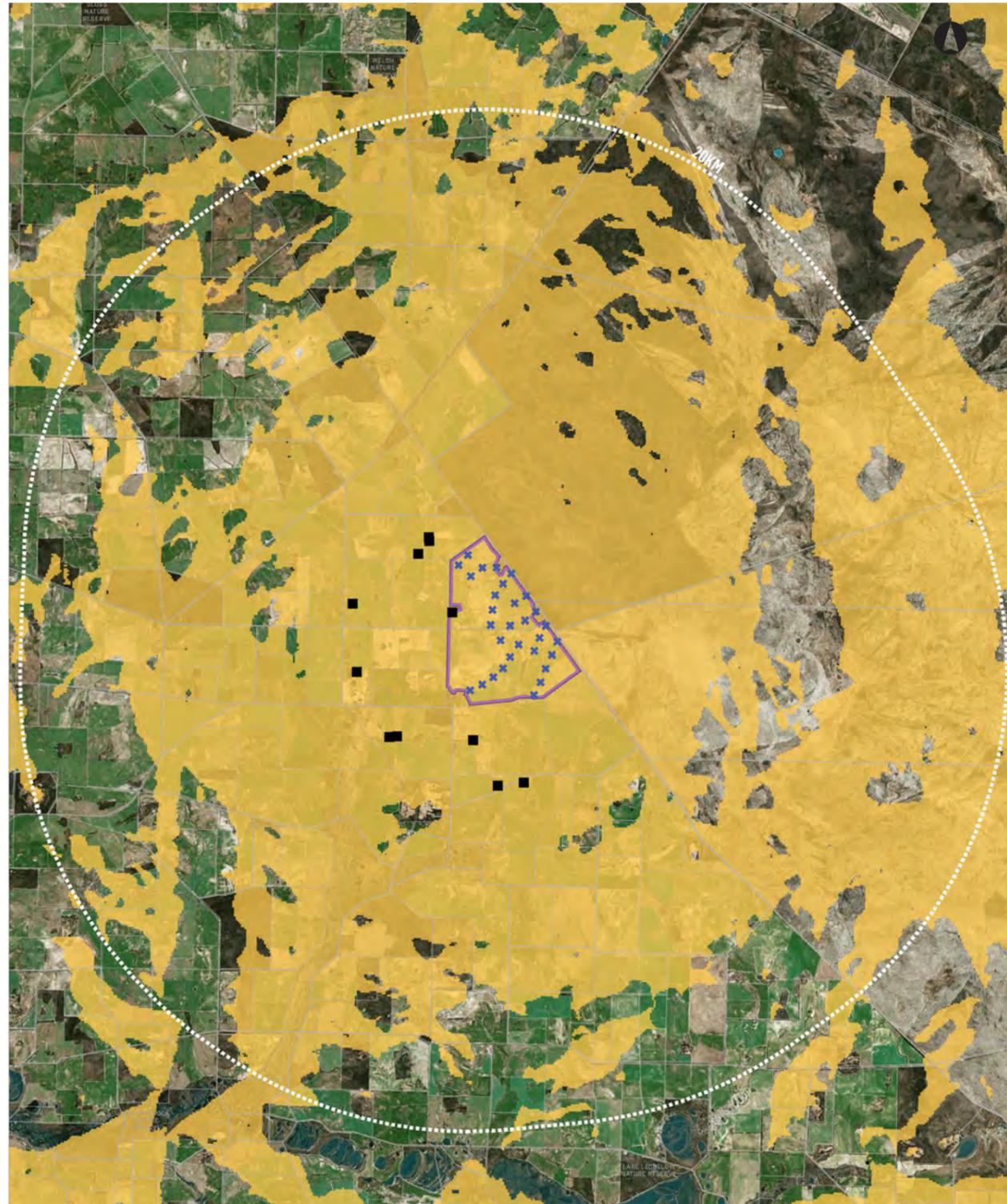
- Identify the location and sensitivity of visual impact vantage points for the project;
- Gather photographs from the identified viewing locations to assist in the assessment process and for the development of photomontages; and,
- Provide information to support the determination of the visual catchment.

Identified viewing locations were then confirmed through the site visit to check the extent of the view and identify areas that are screened with vegetation or built form. Photographs were taken from each identified location with viewing heights set at average standing height of 1.6 metres.

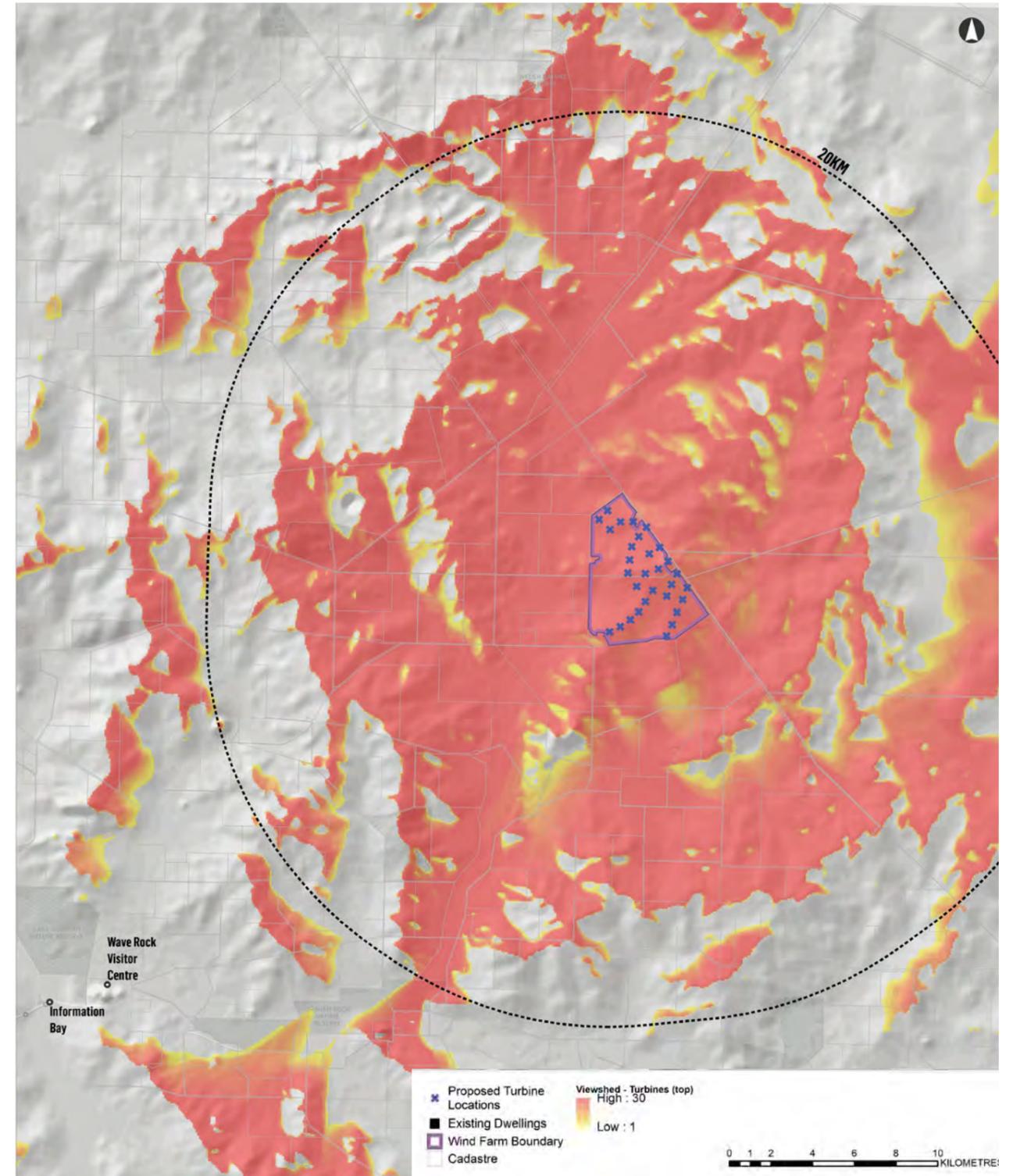
Seven key views were identified as the most suitable viewing locations to undertake the assessment from due to the likelihood of visual change and proximity/accessibility to public viewing locations. The selected views were then used as a basis to develop photomontage images.

Refer: Figure 6_Assessed Vantage Point Locations.

Figure 4 King Rocks Wind Farm - Tower (Including Blades) Visibility Within 20km



NOTE: The viewshed 3D model does not account for screening from vegetation, buildings or other structures. This analysis identifies the areas where the focal point is visible from a viewing location.



3.1.4 EXISTING CHARACTER

Landscape character is the recognisable pattern of elements that occurs in a landscape. Variations in geology and soils, landform, vegetation, land use, settlement patterns and building styles, give rise to different landscapes, each with its own distinctive character and unique sense of place. The landscape character of the visual catchment area was assessed as the basis on which to determine the degree of change to landscape character that would occur as a result of the proposed development.

Visual management objectives and strategies have been adopted by the WAPC for managing landscape character. They include:

- best practice siting and design
- protection and maintenance
- restoration of degraded character or enhancement of opportunities

(WAPC, 2007)

3.1.5 KING ROCKS ENVIRONMENT

The study area surrounding the development proposal is dominated by cleared agricultural fields, limited pockets of retained vegetation and, undulating topography with open views across the landscape. Five landscape character types were identified on site including:

- Agricultural land
- Salt Lakes
- Remnant bushland
- Vegetated corridors and
- Granite outcrops.

Agricultural Land

Agricultural land is the dominant character type within the study area, The landscape is compartmentalised with rural lots and nearly completely cleared of remnant vegetation now managed as wheat fields. Its landscape is gently undulating, with wide sweeping vistas across the landscape. These vistas are punctuated by with isolated areas of remnant vegetation and granite outcrops. **Refer: Figure 5_Existing Character - Agricultural Land.**

The rural land has been cleared for cropping and sheep grazing, although windbreaks and isolated pockets of vegetation have been maintained throughout most properties characterised by Melaluca shrubs and Mallee such as the Eucalyptus salubris.

Salt Lakes

Salt lakes are present to the south and south west of the study area, with a series of Inter-linked, wetlands leading to Lake Liddelow and Lake Hurlstone. They provide a dramatic display with surface salt deposits catching the sun. The lakes are surrounded by remnant vegetation and nature reserves. Fringing vegetation is typically Swamp Sheoaks (*Casuarina obesa*) and Saltwater Paperbarks (*Melaleuca cuticularis*) with Samphires (*Halosarcia* sp.) growing on the salt-flats themselves.

Remnant Bushland

Areas of scattered, remnant bushland have been retained throughout the study area. In these areas a range of eucalyptus species grow. The most prominent species include Eucalyptus salmonophloia with smooth pale grey bark that sheds to reveal salmon-

coloured new bark grow (grows up to 25 metres tall) and Eucalyptus salubris striking copper coloured trunk stands out in the landscape (grows up to 15 metres tall). Both are typically found with medium sized (3-5m tall) Melaluca, Sheoak, Acacia and Kunzea species. Larger areas of national park are maintained to the east of the site including the Forrestiana Nature Reserve, the Jilbadji Nature reserve and Frank Hann National Park.

Roadside Corridor

Roadside corridors throughout the site typically contain remnant or re vegetated areas within narrow linear reserves. These corridors surround rural land parcels and enclose long views providing points of reference within the landscape. The roadside corridors typically contain Mallee-heath with low bushy Acacia and Melaluca species.

Granite Outcrops

The topography surrounding Hyden is relatively flat, however isolated granite outcrops are a common feature. There are many outcrops within the study area that stand out within the surrounding landscape. The outcrops are surrounded by dense pockets of remnant vegetation which benefit from water run-off from the granite surface.

The outcrops provide points of visual interest, a landscape reference point, and a highpoint with viewing opportunities (360 degree panoramic views). Additionally the outcrops typically contain containing culturally significant places.

key granite outcrops within the study area include; The Humps, King Rocks, Anderson Rocks, Gibbs Rock and Wave Rock.

3.1.6 VISUAL EFFECT

Visual effect is the expression of the change in landscape character created by the interaction between the development and the existing environment. It represents the level of contrast between the development and the visual setting within which it is placed. Critical issues include:

- Changes to landform;
- Changes to vegetation patterns; and,
- The nature, density and scale of existing and proposed development.

The way a landscape is perceived can differ amongst observers. As such the Visual Landscape Planning in Western Australia Manual (DPI 2007), provides a guide for assessing general valued characteristics of the landscape.

- A high visual effect would result if the development is a major element and contrasts strongly with the existing landscape. In such a situation there is little or no natural screening or integration, such as could be provided by vegetation or topography. In situations where the existing environment is heavily modified by the proposed development, a high visual effect would also result.
- A moderate visual effect occurs if the proposed development is moderately integrated with the landscape. This would occur if the surrounding vegetation and/ or topography provide some measure of screening, background or other form of visual integration of the development with its setting.
- A low visual effect occurs where there is minimal contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the environment. This can occur through constructed integration of the development with the landscape or by substantial preservation of the existing visual setting.

3.1.7 VISUAL SENSITIVITY

Visual sensitivity is a measure of the importance of the visual environment and the significance of elements within it to the user group (the general public) and how sensitive the existing character of the setting is to the proposed nature of change. Different activities undertaken within the landscape setting have different sensitivity levels. For example, tourists who are using the surrounding landscape as a part of the holiday experience will generally view changes to the landscape more critically than agricultural workers in the same setting. The visual sensitivity of the development depends on a range of user-group characteristics and public perception of the quality or significance of particular landscapes. The characteristics considered in this study are:

- visual use area (refers to the predominant use of the viewing location area);
- frequency (refers to the number of viewers that will be affected by changes in their views. If more people will be affected, the visual impact is likely to be higher);
- duration of view (refers to how long the viewers spend viewing the proposed development impact); and,
- the distance of the proposed development from viewers.

3.1.7.1 Visual Use Area

A measure of how critically a change to the existing landscape will be viewed from various use areas.

- Different activities undertaken within the landscape setting have different sensitivity levels. Tourists who are using the surrounding landscape as a part of the holiday experience will generally view changes to the landscape more critically than agricultural workers in the same setting. Individuals may view changes to the visual setting of their residence more critically than changes to the visual setting in which they travel or work.
 - Low Sensitivity to Change - Local roads / agricultural lands
 - Moderate Sensitivity to Change - recreational areas / sporting reserves / tourist roads.
 - High Sensitivity to Change - tourist attractions / lookouts / national parks.

3.1.7.2 Frequency

Frequency is the number of people who might view the proposed development. Three categories were determined:

- low frequency (side roads and screened areas where people traverse infrequently)
- medium frequency (roads, public walkways or parks that have medium usage by the general public)
- high frequency (public places, thoroughfares, and major roads that have high usage)

3.1.7.3 Duration

Different levels of view duration at various view locations were identified and qualitative descriptions were determined:

- Short - views from naturally vegetated areas that are partially obscured by topography or vegetation
- Moderate - views from local roads where the duration of the view is short to moderate, many of the viewers are frequent users of the road, and their visual sensitivity is constrained because the orientation of the viewer (travelling in a vehicle) is often focussed on the road for much of the time
- Long duration views from residential and public recreational areas. Views include elements that dominate the landscape

- Long duration views from public places that have high visitation, would have highest visual impact. Short duration views, which are partially or largely obscured by existing topography, landscape or structures, would have the lowest visual impact.

3.1.7.4 Distance

The distance zones identified in the Visual Landscape Planning Manual (DPI 2007) have been used in this assessment. The distance zones are as follows:

- Foreground zone - areas within 0-0.5 kilometre of the viewer - within this range the observer experiences maximum discernment of landscape details such as shape, colour and contrast;
- Middle ground zone - areas between 0.5 metres and 6.5 kilometre – within this range, vegetation textures and land use patterns are visible to the observer; and,
- Background zone - areas greater than 6.5 kilometres from the proposed development - within this range, textures and patterns are indistinct to the observer. The viewer is unaware of individual details and discerns broader landscape units as patterns of light and dark.

Viewer locations that fall within the foreground zone are considered to be in the zone of highest visual impact as the proposed development would be part of their ground views. Changes to views in the middle ground are considered to be important, but less important than in the foreground. This is because the subject site is further from the viewer and would therefore occupy a lower proportion of the total view from the identified viewer location. It is considered that visual impact or viewer locations within the background zone is of least significance, however, still worthy of consideration.

3.1.8 VISUAL IMPACT

Visual impact is a measure of the potential effect that the proposed development will have on the visual environment without any remedial treatment. Visual impact is based on a number of factors which affect the perceived visual quality. The degree to which a wind farm development will impact on the landscape will depend upon:

- Siting, layout and design of the turbines, infrastructure, signage and ancillary facilities, including provision for tourism.
- Number, colour, shape, height and surface reflectivity of the towers and blades.
- Visibility of the development, having regard to the location, distance from which the development is visible, skyline and view sheds.
- Significance and sensitivity of the landscape, having regard to topography, the extent and type of vegetation, natural features, land use patterns, built form character and community values

Visual impact depends upon the visual catchment area (extent of visibility), visual sensitivity (the number of views/viewers affected, duration of views, and distance) and visual effect (the degree of visual intrusion or obstruction that will occur). These visual impacts can be positive or negative. Visual impact is determined as a result of the relationship between visual effect and visual sensitivity in accordance with **Table 1 Visual Impact Rating**.

Figure 5 Existing Character - Agricultural Land



Table 1 Visual Impact Rating

		VISUAL EFFECT LEVELS					
		HIGH	MODERATE / HIGH	MODERATE	LOW/MODERATE	LOW	NEGLIGIBLE
SENSITIVITY OF LANDSCAPE TO PROPOSAL	HIGH	HIGH	HIGH	MODERATE / HIGH	MODERATE / HIGH	MODERATE	MODERATE
	MODERATE / HIGH	HIGH	MODERATE / HIGH	MODERATE / HIGH	MODERATE	MODERATE	LOW/MODERATE
	MODERATE	MODERATE / HIGH	MODERATE / HIGH	MODERATE	MODERATE	LOW/MODERATE	LOW/MODERATE
	LOW/MODERATE	MODERATE / HIGH	MODERATE	MODERATE	LOW/MODERATE	LOW/MODERATE	LOW
	LOW	MODERATE	MODERATE	LOW/MODERATE	LOW/MODERATE	LOW	LOW
	NEGLIGIBLE	MODERATE	LOW/MODERATE	LOW/MODERATE	LOW	LOW	NEGLIGIBLE

4.0 VISUAL ASSESSMENT

4.1 ASSESSMENT OF VIEWS

4.1.1 VISUAL CHANGE

The visual impact assessment will evaluate the proposed development by determining the degree of visual change that will occur to the landscape. The main contributing factors towards visual change from the viewing locations within the study area will be the position of the turbines within the landscape and the surrounding vegetation.

The view experience within the study area can be classified as follows:

- enclosed by vegetation – dominant view experience along most roads
- elevated
- panoramic

Visual effect and visual sensitivity are considered from each of the viewing locations in order to determine the potential visual impact.

When considering the visual effect of the proposal on each viewing location the following consistent visual effect judgements are noted:

- Changes to landform - The vertical form of the proposed turbine structures contrasts with the horizontal form of the pasture-land landscape. The development proposal will break the horizon line in various locations;
- Changes to vegetation patterns - The proposed development does result in the loss of views to vegetation however the reduction in views to vegetation are limited and a consistent vegetation pattern is typically maintained within the view-shed; and,
- The nature, density and scale of existing and proposed development - the proposed development integrates well with the surrounding environment due to the sighting of the development and preservation of the surrounding vegetation/landscape.

Each of the selected view locations is assessed using the methodology presented in Section 3. Visual impact is determined as a result of the relationship between visual effect and visual sensitivity. Refer Table 1 Visual Impact Rating.

4.1.2 SELECTED KEY VIEWS

The study area as a whole has expansive views and these are heightened in two key elevated and culturally significant locations including King Rocks and The Humps

King Rocks - A clear view of the project site is available from King Rocks. This elevated point is accessible to the public via a gravel 4WD track and a short hike. This site features a high point at approximately 400m AHD as an open rock formation with limited vegetation interrupting views at the higher point.

The Humps - The Humps is a popular tourist destination with 360 degree uninterrupted views accessible via a posted walking trail. Additionally The destination incorporates Mulka's Cave a culturally significant indigenous heritage site. Both sites are located a short distance from the Hyden Town. The Humps provides impressive views and offers a distant view towards the project site.

The selected key views forming part of the assessment were taken at the closest publicly accessible locations adjacent to the sensitive viewpoints, and prominent locations within the local road network. The following assessment has been prepared based on the likely view possible from the sensitive viewpoint and, therefore, takes into account the effects of screening of views to the proposed development by surrounding vegetation and any existing structures.

4.1.3 VIEW DISTANCE ZONES

The identified views can be categorized into the following distance zones identified in the Visual Landscape Planning Manual (DPI 2007) as follows:

- **Foreground zone** - views of the site from the immediate context are unavailable other than from within the project property. The placement of turbines within the site limits accessible views at this range.
- **Middle ground zone** - The views from King Rocks are elevated with views across most of the elements of the facility. Two of the turbine structures are visible within the Middle-ground zone from this location. All Turbines will be visible within the middle ground from property view 1 and some turbines will be visible within the middleground zone from property views 2 to 8.
- **Background zone** - Some turbines will be visible within the background from property views 2 to 8. The background zone also includes the views identified within potential tourist destinations including The Humps, Gibb Rock and Anderson Rock. The rural pasture land and bushland reserves frame the view at this range.

4.1.4 PHOTOMONTAGES

Photomontages were used to visualise the proposed development from fixed locations. Photographs were taken to create the photomontages consisting of a computer-generated image of the proposed development composited onto the photographs. Digital techniques are used to composite current photographs with computer generated images. This illustrates how the proposed infrastructure might look to a person from a specific location. The process involved taking photographs from select recorded vantage points in the direction of the proposed development. The locations are measured on the floor plan, magnetic bearing of each view, lens spirit level and the camera's focal length were also recorded (to enable field of view to be calculated).

A Computer 3D model of the Study area was created with contour and cadastre information as well as CAD models of the development. Other inputs into the 3D model included the known locations of the viewpoints and the photographer's calculated field of view. Views were then taken from the viewing locations in the 3D model and these were rendered to create white model images of the field of view. The 3D image layer was then merged with the photograph layer to create a photographic impression.

The following were used as input for the modelling process for the photomontages:

- relevant digital photographs taken from the identified vantage points;
- three dimensional (3D) CAD files of the infrastructure;
- heights for proposed infrastructure;
- contour data of the surrounding landscape;
- location and bearing data which describe the views from the vantage points; and,
- reference points, used to align/ check the 3D features against existing scenery.

Photomontages were created at 9 key viewing points, to aid in the assessment of visual impact. These viewing points and the potential visual impact of the development are outlined in the following section of the report.

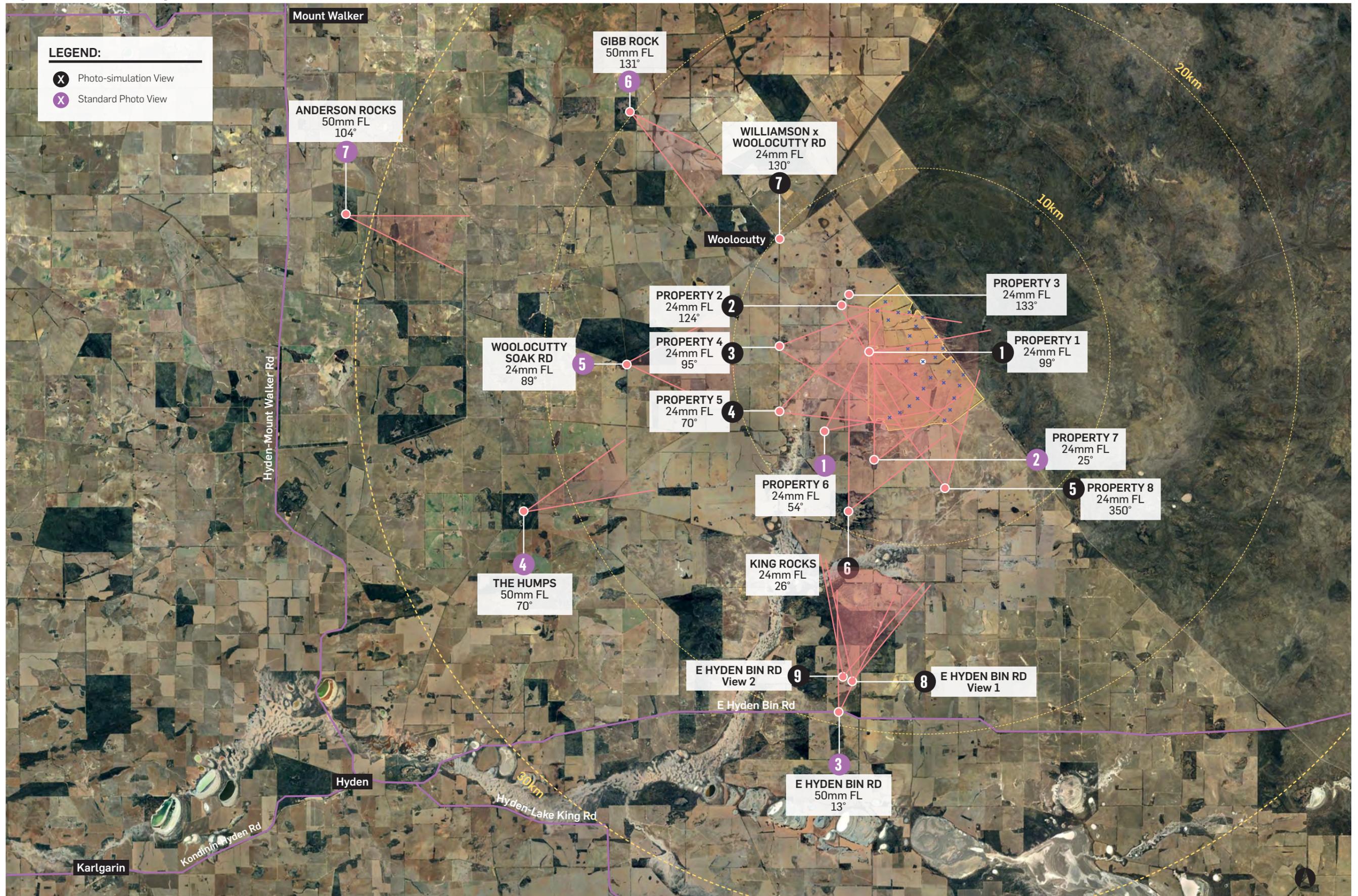
4.1.5 VIEW LOCATION ANALYSIS

An analysis of view locations identified has been undertaken as a basis for assessing the impact that the proposed development will have on the existing view.

Each of these views is assessed using the methodology outlined within this report and presented in the view location assessment.

Refer: 5.0 View Location Assessment.

Figure 6 Assessed Vantage Point Locations



1 PHOTO-SIMULATION 1 PROPERTY 1

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~2,930m	Site Angle (to centre) 99°	Site Distance (to nearest turbine) ~2,050m
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VISUAL EFFECT

HIGH

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Clear View / Minor Screening

The closeness of the wind farm would result in turbines being clearly visible the vantage point, and along the road where the view is not obstructed by roadside vegetation. A wide band of remnant vegetation to the north along the site entry road will partially screen views to some turbines. Bands of intervening vegetation in the middle to background will screen views of the lower parts of the turbines. The landowners residence will be surrounded by screening vegetation which will limit any direct impact on views from the residence.

VISUAL SENSITIVITY

MODERATE

- Frequency of Viewers - Low
- Duration of View - Static
- Distance of Nearest Turbine - Mid-ground

This vantage point is located off a minor north-south road which would predominantly be visited by a limited number of local residents or workers, including those associated with the project site. Frequency of viewers in this location is low and duration is long, however distance of the development results in a moderate sensitivity

LANDSCAPE CHARACTER

The viewpoint is taken off King Rocks Road North at the entry to a residence within the project site. The broader landscape is mostly cleared, with occasional bands of vegetation located along roads and paddock boundaries. A dense band of vegetation is located to the north of the viewing location.



VISUAL IMPACT

MODERATE / HIGH

- Visual Prominence of Turbines - High

Remnant vegetation and windbreaks in the middle to background would partially screen views to the project but the blades and upper parts of the turbines would be possible. In this instance, the moderate sensitivity combined with a high level of visual prominence will result in a moderate/high potential visual impact.



PANORAMA (CONTEXT ONLY)



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

2 PHOTO-SIMULATION 2 PROPERTY 2

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~5,400m	Site Angle (to centre) 124°	Site Distance (to nearest turbine) ~1,850m
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VISUAL EFFECT

MODERATE

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Partially Screened

The viewpoint location is separated from the project site by bands of vegetation, with a very wide and dense band of vegetation located to its east. Views towards the project site are available within the mid-ground and will contrast with the surrounding vegetation however, the vegetation will screen views to the lower parts of the turbines and partially screen views to the blades.

VISUAL SENSITIVITY

MODERATE

- Frequency of Viewers - Low
- Duration of View - Moderate
- Distance of Nearest Turbine - Mid-ground

This vantage point is located on a minor east-west access road which predominantly serves the local residents. The frequency of viewers in this location is low. The close proximity of the development results in a moderate sensitivity.

LANDSCAPE CHARACTER

The viewpoint is taken from an access road off King Rocks Road North. The broader landscape is mostly cleared pastoral land which is dissected by windbreaks and other bands of vegetation separating the viewer from the project site.

VISUAL IMPACT

MODERATE

- Visual Prominence of Turbines - Moderate

The closeness of the wind farm would result in turbines being partially visible from the vantage point. The moderate sensitivity due to proximity combined with a moderate visual effect will result in a moderate potential visual impact.



PANORAMA (CONTEXT ONLY)



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

3 PHOTO-SIMULATION 3 PROPERTY 4

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~8,890m	Site Angle (to centre) 95°	Site Distance (to nearest turbine) ~5,650m
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VISUAL EFFECT

MODERATE

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Partially Screened

While views to the project site will be partially screened from Williamson road by the roadside vegetation, the project will be visible in the background of this viewpoint above intervening roadside and paddock boundary vegetation. The elevated position of the turbines at the top of a ridge line would result in the turbines being visible in the distance. Vegetation within paddocks between the viewing location and project site will have a minimal screening effect only.

VISUAL SENSITIVITY

MODERATE

- Frequency of Viewers - Low
- Duration of View - Moderate
- Distance of Nearest Turbine - Mid-ground

Although Williamson Road is primarily used by local residents it may be used by road users with an interest in visiting or seeing the salt lakes and nature reserves surrounding King Rocks. The frequency of viewers in this location is low and the duration of view is moderate. The proximity of the development results in a moderate sensitivity

LANDSCAPE CHARACTER

The viewpoint is located off Williamson Road in an open, slightly undulating pastoral landscape. An area of dense remnant vegetation is retained to the north of the viewpoint. Windbreaks of native vegetation line nearby paddock boundaries and roads. Scattered, areas of native vegetation are located to around the residence and other structures within the property to the north and east and south, with a continuous band of trees being located to the south and east.

VISUAL IMPACT

MODERATE

- Visual Prominence of Turbines - Moderate

The vegetation within the property will not greatly reduce views to the project. The turbines will be visually prominent although this is mitigated somewhat by distance. The moderate visual sensitivity combined with moderate visual effect will result in a moderate visual impact.



PANORAMA (CONTEXT ONLY)



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

4 PHOTO-SIMULATION 4 PROPERTY 5

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~8,320m	Site Angle (to centre) 70°	Site Distance (to nearest turbine) ~6,050m
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VISUAL EFFECT

MODERATE

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Partially Screened

Roadside vegetation will assist in screening views to the project site. Where there are breaks in the vegetation such as at the property entry, the project will be visible in the background of this viewpoint. The elevated position of the turbines at the top of a ridge line would result in the turbines being visible in the distance. Vegetation within paddocks will help to screen views to the lower parts of some turbines however blades will be visible above the vegetation

VISUAL SENSITIVITY

MODERATE

- Frequency of Viewers - Low
- Duration of View - Moderate
- Distance of Nearest Turbine - Background

Although Williamson Road is primarily used by local residents it may be used by road users with an interest in visiting or seeing the salt lakes and nature reserves surrounding King Rocks. The frequency of viewers in this location is low and the duration of view is moderate. The proximity of the development results in a moderate sensitivity

LANDSCAPE CHARACTER

The viewpoint is located in an open, slightly undulating pastoral landscape. Dense windbreaks of native vegetation line nearby paddock boundaries and roads. Dense plantings of native trees are located around the residence to the north east, with a continuous band of trees being located to the east surrounding an ephemeral stream.



VISUAL IMPACT

MODERATE

- Visual Prominence of Turbines - Moderate

The vegetation around the residence would provide a small degree of visual screening. Given the rising topography the turbines will be visible although this is mitigated somewhat by distance. The moderate visual sensitivity combined with moderate visual effect will result in a moderate visual impact.



PANORAMA (CONTEXT ONLY)



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

5 PHOTO-SIMULATION 5 PROPERTY 8

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~7,070m	Site Angle (to centre) 350°	Site Distance (to nearest turbine) ~3,650m
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VISUAL EFFECT

LOW / MODERATE

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Partially Screened

The surrounding existing vegetation provides a measure of screening, of the project site from this viewpoint. From Murray Rock Road, the project will be visible between breaks in intervening roadside and paddock boundary vegetation and blades may be visible above the vegetation

VISUAL SENSITIVITY

MODERATE

- Frequency of Viewers - Low
- Duration of View - Moderate
- Distance Zone - Midground Zone

There is limited roadside vegetation on the northern boundary of the road which would result in the turbines being more visible. however dense existing vegetation within the paddocks assists in screening the view. Murray Rocks road is primarily used by local residents however may be used by road users with an interest in visiting or seeing the salt lakes and nature reserves surrounding King Rocks. The frequency of viewers in this location is low and the duration of view is moderate. The proximity of the development results in a moderate sensitivity.

LANDSCAPE CHARACTER

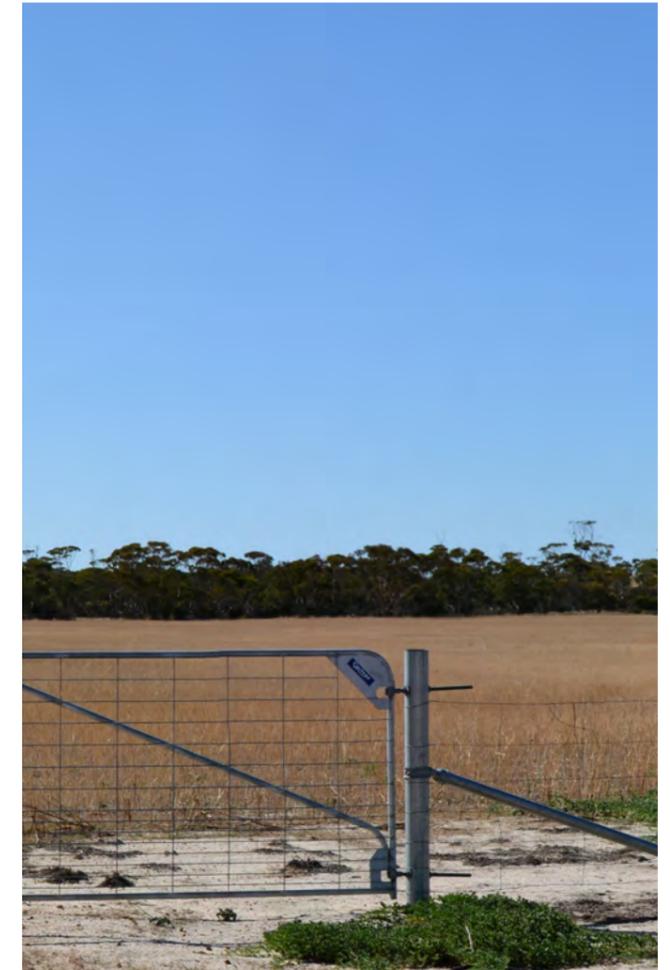
The viewpoint is located to the south of the project site off Murray Rock Road, in an open, pastoral landscape. A dense group of retained vegetation is maintained to the north of the paddock. Additional windbreaks line nearby paddock boundaries and roads between the residence and the project site to the north.

VISUAL IMPACT

MODERATE

- Visual Prominence of Turbines - Low

The distance to the wind farm and the presence of a the dense existing vegetation help to obscure the view to the project site. The visual impact from this vantage point is considered to be Moderate.





50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

6 PHOTO-SIMULATION 6 KING ROCKS

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~8,9850	Site Angle (to centre) 26°	Site Distance (to nearest turbine) ~5,200m
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VISUAL EFFECT

MODERATE / HIGH

- Landscape Character Unit / Granite Outcrop
- Viewpoint Screening - Limited Screening

The elevated position at the top of King Rock would result in the turbines being visible in the mid-ground view. Although at ground level on the northern side of the rock, the existing vegetation and terrain would be expected to obscure sightlines to wind turbines.

VISUAL SENSITIVITY

MODERATE / HIGH

- Frequency of Viewers - Moderate
- Duration of View - Long
- Distance Zone - Midground Zone

The site provides a high scenic quality viewing opportunity due to the elevated location and expansive 360 degree panoramic views. Visual sensitivity is considered moderate/high, due to its landscape and visual character offering a viewing destination for both locals and tourists, the long views provided across the project site and proximity to the turbines. Visitation to this viewing location is likely to be seasonal. Access to the viewing location is limited to visitors travelling in a 4WD.

LANDSCAPE CHARACTER

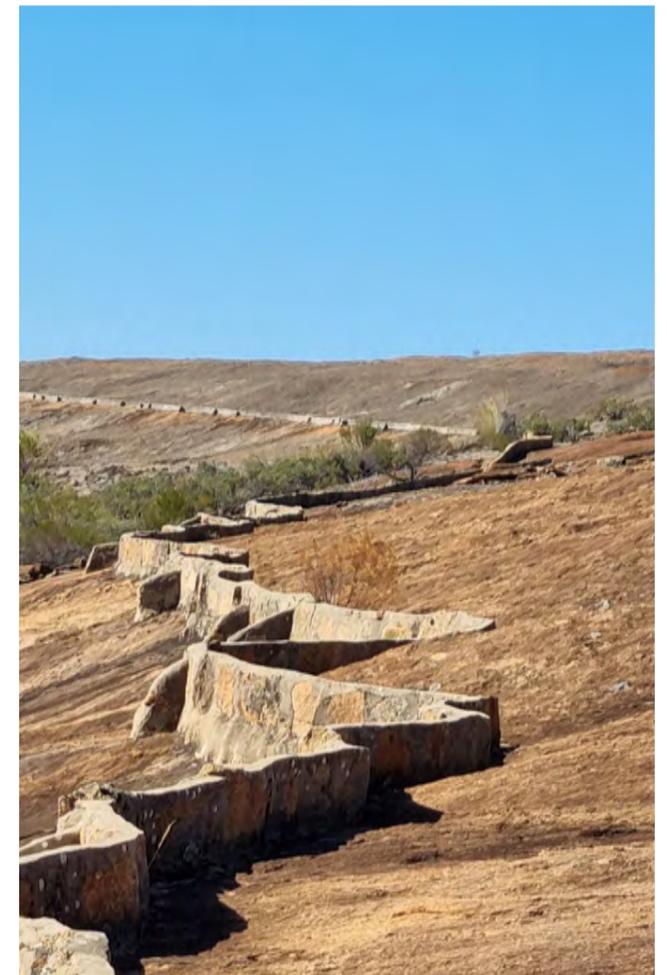
King Rocks a significant granite outcrop in the Hyden Region, which provides a 360 degree outlook and is situated south west of the project site. The outcrop is surrounded by dense endemic vegetation.. A constructed dam wall run along the perimeter of the rock face to collect runoff for farming purposes.

VISUAL IMPACT

MODERATE / HIGH

- Visual Prominence of Turbines - High

The middle ground zone proximity of the wind farm and high vantage point above the surrounding terrain would provide a clear view to all turbines within the Project Site. The project sight would create a noticeable change to a portion of the view north east of this viewing location. The moderate/high visual sensitivity combined with moderate/high visual effect will result in a moderate/high visual impact.



PANORAMA (CONTEXT ONLY)



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

7 PHOTO-SIMULATION 7 WILLIAMSON RD X WOOLCUTTY RD

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~10,320m	Site Angle (to centre) 130°	Site Distance (to nearest turbine) ~6,620m
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VISUAL EFFECT

LOW / MODERATE

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Partially Screened

The vegetation located to the south and west of the viewpoint would provide partial screening of views to the project site. Blades may be visible above the vegetation where the lower parts of the turbines are screened.

VISUAL SENSITIVITY

LOW / MODERATE

- Frequency of Viewers - Low
- Duration of View - Moderate
- Distance Zone - Background Zone

Woollocutty Soak Road is a sealed surface and one of the more frequently-used rural roads in the study area, however due to its location would rarely be used by tourists. The primary direction of view is also not directed towards the development site. The frequency of viewers in this location is low and the duration of view is moderate. The distance of the project site results in a low/moderate sensitivity.

LANDSCAPE CHARACTER

The viewpoint is located at a prominent intersection to the north of the project area within a generally flat, to slightly undulating, open pastoral landscape with occasional areas of vegetation along roadsides and within paddocks.

VISUAL IMPACT

LOW / MODERATE

- Visual Prominence of Turbines - Moderate.

The vegetation surrounding the viewpoint would provide a degree of visual screening. Windbreaks would partially to fully screen views to the project area. Views to blade tips may be possible. In these instances, there will be a low impact. Where views are possible through breaks in, and over vegetation, the low/moderate sensitivity combined with a low/moderate level of visual effect will result in low/moderate potential visual impact.



PANORAMA (CONTEXT ONLY)



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

8 PHOTO-SIMULATION EAST HYDEN BIN ROAD - VIEW 1

Camera Lens Height From Ground ~1.55m	Site Distance to Closest Turbine ~15,200m	Site Angle (to centre) 10°
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VISUAL EFFECT

LOW

- Landscape Character Unit / Remnant Bushland
- Viewpoint Screening - Screened View

The view towards the project site will be screened by the significant area of remnant vegetation surrounding the house and in close proximity to the viewing location. The view to turbine blades is not likely to be seen above the vegetation and any view of the blades from this distance would be imperceptible

VISUAL SENSITIVITY

LOW

- Frequency of Viewers - Low
- Duration of View - Low/Moderate
- Distance Zone - Background Zone

This viewing location is situated next to the homestead and is surrounded by a large pocket of remnant vegetation which comprises the foreground of views. This vegetation obscures the project infrastructure. The site would predominantly be visited by the residents. The frequency of viewers in this location is low and the duration of view is low/moderate. The distance of the project site results in a low sensitivity

LANDSCAPE CHARACTER

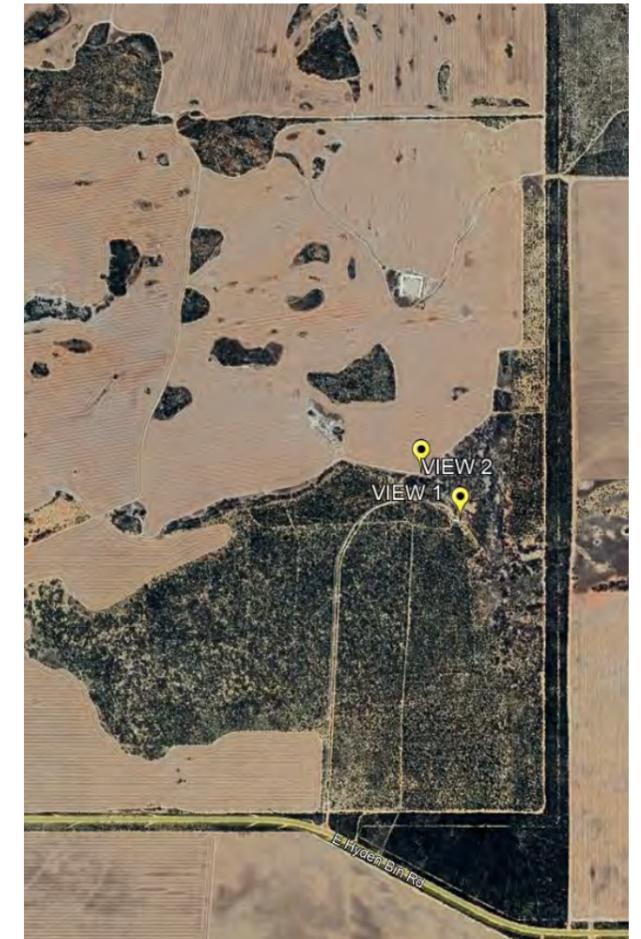
The viewpoint is located 15km to the south of the site in a private residential property off East Hyden Bin Road. The viewing location is situated behind a large pocket of remnant vegetation separating the viewpoint and project site to the north.

VISUAL IMPACT

LOW

- Visual Prominence of Turbines - Low/Moderate

The presence of existing vegetation from this viewpoint will obscure the view to project site infrastructure. The visual impact from this vantage point is considered to be Negligible.





35MM FL VIEW

PHOTO EXTENT - 24MM FL

9 PHOTO-SIMULATION EAST HYDEN BIN ROAD - VIEW 2

Camera Lens Height From Ground ~1.55m	Site Distance to Closest Turbine ~15,050	Site Angle (to centre) 10°
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VISUAL EFFECT

LOW / MODERATE

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Partially Screened

The view towards the project site will not be limited by topography. Vegetation located within and surrounding the paddocks will provide partial screening of views to the project site. The turbine structures and blades will be visible above the vegetation. The view to turbines/blades from this distance would be minimal and result in a low /moderate visual effect.

VISUAL SENSITIVITY

LOW / MODERATE

- Frequency of Viewers - Moderate
- Duration of View - Low/Moderate
- Distance Zone -Background Zone

There is limited screening vegetation within the foreground zone however there will be dense pockets of existing vegetation within the middlegroud and background views. The property owners advise that the property is used as a tourist destination for wildflower tours. The frequency of viewers in this location is likely to be moderate and seasonal. The duration of view from the viewing location would be low/moderate. The focus of wildflowers as part of the tour suggests that the view may be directed to the foreground rather than the horizon. The turbines will likely be visible in the background, the distance of the project site results in a low/moderate sensitivity.

LANDSCAPE CHARACTER

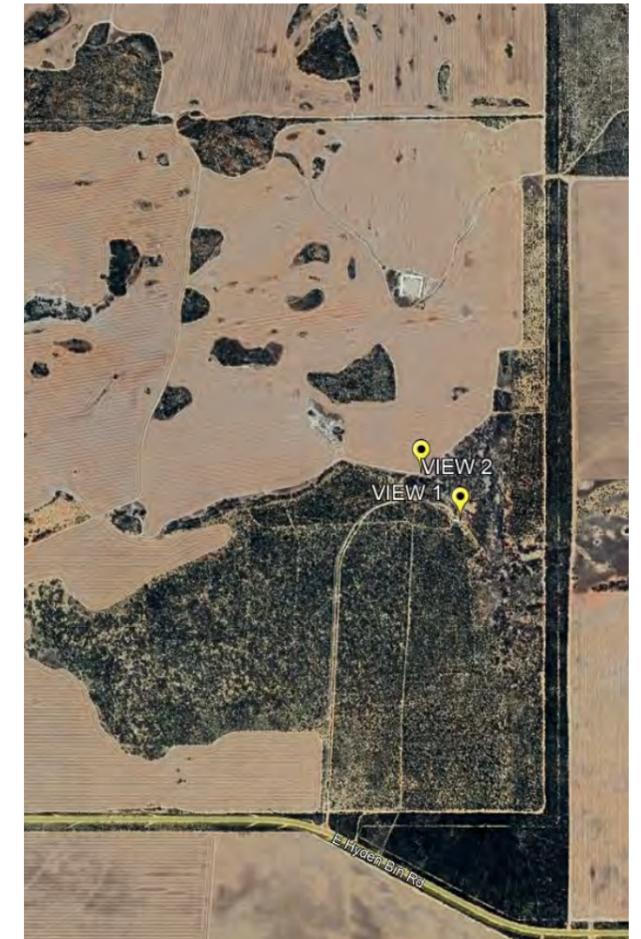
The viewpoint is located approximately 15km south of the project site off East Hyden Bin Road, in an open, pastoral landscape area. Some tall trees and low groups of native vegetation are located within nearby paddocks. Continuous bands of trees break up the pastoral landscape between the viewing location and project site running east west.

VISUAL IMPACT

LOW / MODERATE

- Visual Prominence of Turbines - Moderate

The vegetation within the viewpoint would provide minimal visual screening. Views to turbines and blade tips will be possible however at this distance, there will be a low/moderate impact.





35MM FL VIEW

PHOTO EXTENT - 24MM FL

1 PHOTO VIEW 1 PROPERTY 6

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~6,620m	Site Angle (to centre) 54°	Site Distance (to nearest turbine) ~3,650m
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VISUAL EFFECT

LOW / MODERATE

- Landscape Character Unit / Agricultural Land
- Viewpoint Screening - Partially Screened

The vegetation located within and surrounding the paddocks would provide partial screening of views to the project site. The blades may be partially visible above the vegetation where the lower parts of the turbines are screened.

VISUAL SENSITIVITY

MODERATE

- Frequency of Viewers - Low
- Duration of View - Moderate
- Distance Zone - Midground Zone

There is limited roadside vegetation along this section of road however dense vegetation planted within and surrounding the paddocks provides a screen from views to the turbines. The road is unsealed but may be used by road users with an interest in visiting or seeing the salt lakes and nature reserves surrounding King Rocks. The frequency of viewers in this location is low and the duration of view is moderate. The proximity of the development results in a moderate sensitivity.

LANDSCAPE CHARACTER

The viewpoint is located on Lovering Road in an open, pastoral landscape. Dense groups of native vegetation are located within nearby paddocks and linear plantings of native trees surround them, with a continuous band of trees running north south and separating the viewing location from the development site.

VISUAL IMPACT

MODERATE

- Visual Prominence of Turbines - Moderate

The vegetation surrounding the viewpoint would provide a degree of visual screening. Views to blade tips may be possible. In these instances, there will be a moderate impact.



PANORAMA (CONTEXT ONLY)

NOTE: This image is not a photomontage and provides a photograph of the viewing location only. The Wind turbines have not been modeled within this view.



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

2 PHOTO VIEW 2 PROPERTY 7

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~6,040m	Site Angle (to centre) 25°	Site Distance (to nearest turbine) ~2,500m
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VISUAL EFFECT

LOW

- Landscape Character Unit / Roadside Corridor / Remnant Bushland
- Viewpoint Screening - Partially Screened

The close proximity of the wind farm would result in turbines being visible from this location however this will largely be screened by the significant area of remnant vegetation in close proximity to the viewing location. The view to some turbines would be visible above the tree canopy.

VISUAL SENSITIVITY

LOW / MODERATE

- Frequency of Viewers - Low
- Duration of View - Low
- Distance Zone - Midground Zone

This location includes a sizeable pocket of remnant vegetation to the north which would be in the foreground of views of the wind farm and would obscure most of the project infrastructure. The site would predominantly be visited by local residents. The frequency of viewers in this location is low and the duration of view is low. The distance of the project site results in a low/moderate sensitivity.

LANDSCAPE CHARACTER

The viewpoint is located to the south of the site and is situated behind a large pocket of remnant vegetation. Scattered, but generally linear plantings of native trees are located between the viewpoint and project site to the north.

VISUAL IMPACT

LOW / MODERATE

- Visual Prominence of Turbines - Low/Moderate

The presence of existing vegetation from this viewpoint will largely obscure the view to project site infrastructure. The visual impact from this vantage point is considered to be Low/Moderate.



PANORAMA (CONTEXT ONLY)

NOTE: This image is not a photomontage and provides a photograph of the viewing location only. The Wind turbines have not been modeled within this view.



3 PHOTO VIEW 3 E HYDEN BIN ROAD

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~19,800m	Site Angle (to centre) 13°	Site Distance (to nearest turbine) ~16,350m
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VISUAL EFFECT NEGLECTIBLE

- Landscape Character Unit / Roadside Corridor / Remnant Bushland
- Viewpoint Screening - Screened View

The view towards the project site will be screened by the significant area of remnant vegetation in close proximity to the viewing location. If turbine blades can be seen above the vegetation, the view from this distance would be imperceptible.

VISUAL SENSITIVITY LOW

- Frequency of Viewers - Low
- Duration of View - Low
- Distance Zone - Background Zone

This viewing location is situated on a more prominent road within the study area however it is well screened with roadside vegetation. The low duration of view and large distance from the project site results in a low sensitivity.

LANDSCAPE CHARACTER

The viewpoint is located to the south of the site off East Hyden Bin Road. The viewing location is situated behind a large pocket of remnant vegetation separating the viewpoint and project site to the north.

VISUAL IMPACT LOW

- Visual Prominence of Turbines - Low/Moderate

The presence of existing vegetation from this viewpoint will obscure the view to project site infrastructure. The visual impact from this vantage point is considered to be minimal.



NOTE: This image is not a photomontage and provides a photograph of the viewing location only. The Wind turbines have not been modeled within this view.



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

4 PHOTO VIEW 4 THE HUMPS

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~23,600m	Site Angle (to centre) 70°	Site Distance (to nearest turbine) ~21,050m
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VISUAL EFFECT NEGLECTIBLE

- Landscape Character Unit / Granite Outcrop
- Viewpoint Screening - Partially Screened / Distance View

While the wind farm may be visible from the vantage point, the distance will ensure that the detail of structures is difficult to view and will not greatly effect scenic quality.

VISUAL SENSITIVITY HIGH

- Frequency of Viewers - High
- Duration of View - Long
- Distance Zone - Background Zone

The site provides a High scenic quality due to the expansive 360 degree panoramic views. It is a highly popular tourist in the region due to its proximity to Hyden town and tourist facilities including car parks, walking trails toilets and tourist information boards. The location is a culturally significant destination and contains Indigenous rock artwork within Mulka's Cave. Visual sensitivity is considered high, due to its landscape and visual character, attracting both locals and tourists.

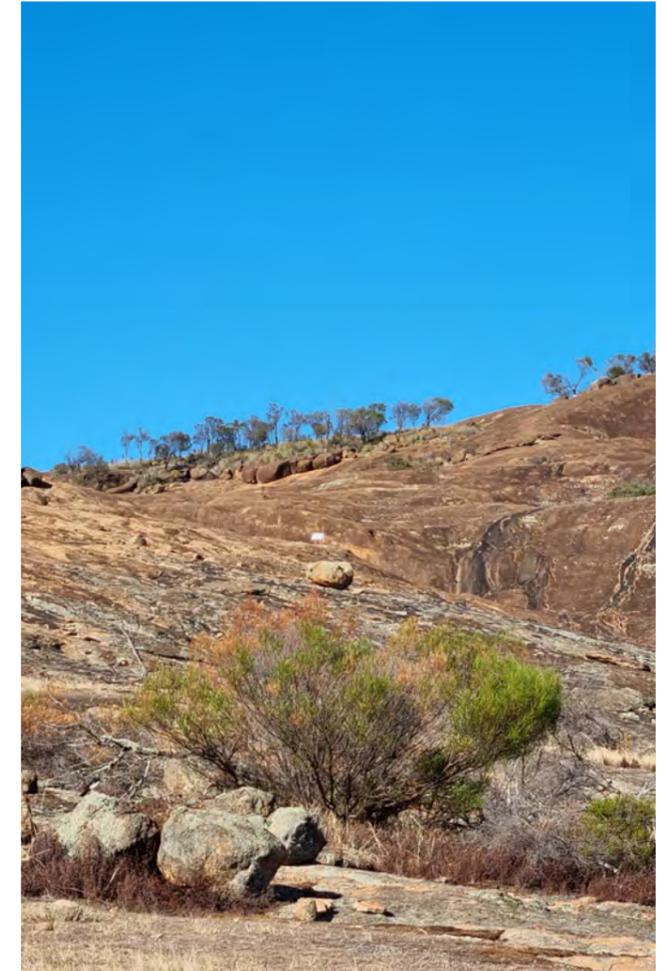
LANDSCAPE CHARACTER

The Humps is a highly significant granite outcrop within the Hyden region and provides an elevated 360 degree outlook across the granite outcrop, over the surrounding vegetation reserve towards rural farmland beyond.

VISUAL IMPACT MODERATE

- Visual Prominence of Turbines - High

While the visual sensitivity is high the large distance from the project site, will have a low visual effect and will result in only a moderate impact. While views of the project site may be possible, clear details of the windfarm will be difficult to see and the visual effect will be negligible



PANORAMA (CONTEXT ONLY)

NOTE: This image is not a photomontage and provides a photograph of the viewing location only. The Wind turbines have not been modeled within this view.



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

5 PHOTO VIEW 5 WOOLCUTTY SOAK RD

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~16,200m	Site Angle (to centre) 89°	Site Distance (to nearest turbine) ~13,950m
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VISUAL EFFECT

LOW / MODERATE

- Landscape Character Unit / Agricultural Land / Remnant Bushland
- Viewpoint Screening - Partially Screened / Distance View

While the wind farm will be visible from the vantage point, and along the road where the view is not obstructed by roadside vegetation, the distance will ensure that the detail of structures is difficult to view and will not greatly effect scenic quality.

VISUAL SENSITIVITY

LOW

- Frequency of Viewers - Low
- Duration of View - Static
- Distance Zone - Background Zone

This vantage point is located on a minor road which would predominantly be visited by local residents. The frequency of viewers in this location is low and the duration of view is low. The distance of the project site results in a low/moderate sensitivity.

LANDSCAPE CHARACTER

The viewing location is an open, slightly undulating pastoral landscape. A dense pocket native vegetation is retained to the north of the viewing location. Windbreaks and scattered, but generally linear pockets of vegetation line nearby paddock boundaries separating the viewpoint from the project site.

VISUAL IMPACT

LOW / MODERATE

- Visual Prominence of Turbines - Low

The position of the viewing location to the west of the project site would result in the turbines being visible in the distance. The distance of the view and visual separation created by retained vegetation would result in a low visual impact.



PANORAMA (CONTEXT ONLY)

NOTE: This image is not a photomontage and provides a photograph of the viewing location only. The Wind turbines have not been modeled within this view.



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

6 PHOTO VIEW 6 GIBB ROCK

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~21,380m	Site Angle (to centre) 131°	Site Distance (to nearest turbine) ~17,550m
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VISUAL EFFECT

LOW

- Landscape Unit / Granite Outcrop
- Viewpoint Screening - Minor Screening / Distance View

The elevated position at the top of Gibb Rock would result in the turbines being visible in the distance. The existing vegetation and terrain would be expected to slightly obscure sight lines to wind turbines. The distance of over 20 km to the project site will ensure that the detail of structures is difficult to view and will not greatly effect scenic quality.

VISUAL SENSITIVITY

MODERATE

- Frequency of Viewers - Moderate
- Duration of View - Static
- Distance Zone - Background Zone

The site provides a High scenic quality due to the expansive panoramic views. It is not as well visited as other granite outcrops in the region due to its distance from the Hyden town and limited access. Visual sensitivity is considered moderate, due to its landscape and visual character, attracting both locals and tourists.

LANDSCAPE CHARACTER

Gibb Rock is a significant granite outcrop within Woollocutty, and provides an elevated outlook across the granite outcrop, over the surrounding vegetation reserve towards rural farmland beyond..



VISUAL IMPACT

LOW / MODERATE

- Visual Prominence of Turbines - Low

Given the distance from the project, there will be a low/moderate impact. While views may be possible clear detail of the windfarm will be imperceptible the visual effect will be low.



PANORAMA (CONTEXT ONLY)

NOTE: This image is not a photomontage and provides a photograph of the viewing location only. The Wind turbines have not been modeled within this view.



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

7 PHOTO VIEW 7 ANDERSON ROCKS

Camera Lens Height From Ground 1.55m	Camera Lens Focal Length (full frame equivalent) 35mm	Horizontal Field of View 54.4°	Site Distance (to centre) ~32,700m	Site Angle (to centre) 104°	Site Distance (to nearest turbine) ~29,650m
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VISUAL EFFECT

LOW

- Landscape Unit / Granite Outcrop
- Viewpoint Screening - Minor Screening / Distance View

The elevated position at the top of Anderson Rock would result in the turbines being partially visible in the distance however any detail would be difficult to perceive.

VISUAL SENSITIVITY

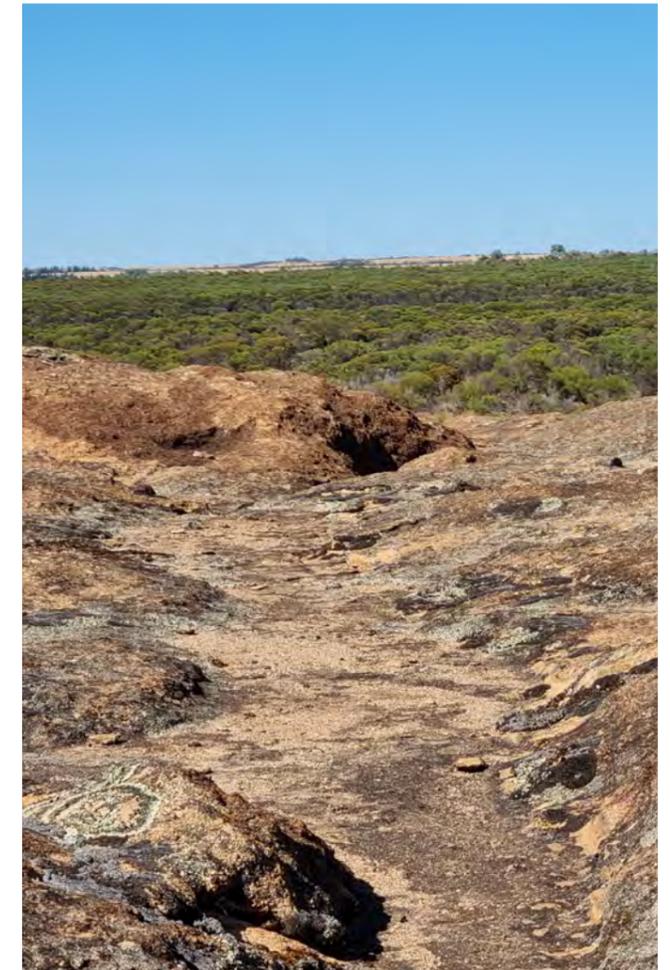
LOW / MODERATE

- Frequency of Viewers - Low
- Duration of View - Long
- Distance Zone - Background Zone

The site provides a High scenic quality due to the elevated panoramic views. It is more difficult to reach than other tourist destinations due to its distance from the Hyden town and limited access. Visual sensitivity is considered low/moderate, as while its landscape and visual character, may attract both locals and tourists the distance of the project site would mean any project details are imperceptible.

LANDSCAPE CHARACTER

Anderson Rock is a significant granite outcrop within the region providing an elevated outlook towards rural farmland.



VISUAL IMPACT

LOW / MODERATE

- Visual Prominence of Turbines - Negligible

Given the distance from the project, there will likely be a negligible impact however due to the scenic quality of the location a low/moderate visual impact rating is applied.



PANORAMA (CONTEXT ONLY)

NOTE: This image is not a photomontage and provides a photograph of the viewing location only. The Wind turbines have not been modeled within this view.



50MM FL REFERENCE VIEW

ORIGINAL PHOTO EXTENT - 35MM FL

5.0 SUMMARY AND MITIGATION

5.1 SUMMARY OF VISUAL IMPACTS

5.1.1 IMPACTS ON VIEW EXPERIENCE

The viewshed and 3D modelling results showed that the development area should be visible from the majority of the identified view locations within the study area. The photo montage analysis revealed that the view to the project site from many of these locations is well-screened and views to the project site are limited by the existing remnant vegetation.

The analysis showed that foreground views of the facility are not publicly available. Middle-ground views are available however they are typically available from infrequently visited locations and are often partially screened by vegetation. Background views and elevated views are typically less contained however the detail of the project site will be less clear at distance.

5.1.2 IMPLEMENTATION AND VISUAL IMPACT DURING CONSTRUCTION

Prior to construction and removal of any existing vegetation, it is recommended that seed collection take place through the surrounding endemic vegetation areas to ensure there is suitable endemic seed available for rehabilitation planting if required. Visual impact mitigation works should be carried out prior to construction where possible to allow the maximum time for establishment of new plantings.

Construction zones, construction specific access roads and site compound areas are to be located in areas that create minimum impact on existing vegetation. Where endemic vegetation requires removal, this should be restored with new endemic planting once construction has been completed.

Following the completion of construction activities re-vegetate to reinstate any disturbed endemic vegetation areas to improve the quality of the immediate surroundings.

5.1.3 MITIGATION

The proposed development includes installation of large turbines and other built-form structures. The focus of the visual assessment has been to look at the impact of these structures from public vantage points at locations where the view may be impacted.

Visual Landscape Planning in WA (WAPC 2007) identifies a series of methods to ameliorate visual impact of wind turbines. We have prepared the following mitigation strategies in line with these recommendations to assist in the preparation of detailed designs and to clarify possible scope of work for landscape treatment.

5.1.4 MITIGATION STRATEGIES

The following visual treatment actions, derived from background research and past experience, are recommended and identified below to assist in reducing the impact levels of the development.

Foreground Visual Screening / Forward Planting

- In areas of high visual sensitivity, such as close to residences and other areas where amelioration of views to the wind farm may be required,
- Given the height of wind generators, visual screening within a setting is most effective when the screening is close to viewing points.
- Planting to screen views of the wind farm should attempt to avoid impeding the existing significant views to the broader landscape.

Remnant Vegetation Actions

Specific mitigation strategies should include the following;

- retain existing roadside and other significant bands of vegetation,
- minimising the extent of native vegetation removed or disturbed by new development, and
- where disturbance of native vegetation occurs, reinstate the vegetation following decommissioning.

Turbine Design Actions

- Use of uniform colour, structure types, surface finishes and direction of rotation to minimise project visibility.
- A light blue / white / grey colour has proven to work best in locations where the turbines are back dropped by sky and clouds.
- Non-reflective coatings must cover all of the structure, including fastenings between the blades and the hub.
- Control the placement and limit the size, colour and number of labels or markings placed on individual turbines or advertising on fences and facilities.

Turbine Placement Actions

- Minimise the number of turbines, as appropriate, by using the largest possible model (subject to the visual absorption capabilities and environmental considerations of the site) rather than numerous small ones.
- Control the location of turbine densities and layout geometry to minimise visual impacts. Mixing of turbine types and rotational direction should be avoided.
- Roughly equally spaced turbines create better rhythm and harmony in the landscape, although a degree of consolidation is preferable to being too broadly spaced.
- Manage wind farm layouts to ensure that no more than 10 turbines are located within 2 km of any residence and no more than 40 turbines are located within 4 km of any residence.

Project Infrastructure Actions

- Use of low-profile and unobtrusive building designs to minimise the urbanised appearance or industrial character of sites located in rural or remote areas.
- Use traditional rural building styles of the area in the construction of the substations and other above ground structures.
- Underground power lines within the site where practicable and integrate equipment wherever possible,
- select material colours for all new structures to blend into the surrounding landscape (pasture/vegetation coloured) and minimise visibility of the new facilities.

Light Spill

Specific mitigation strategies should include the following;

- light spill from the turbines should be minimised where possible to reduce impacts on surrounding residential areas, Flight/aviation warning lighting must however be designed to comply with aviation safety standards
- Security lighting throughout the wind farm and the substation should be minimised to decrease the contrast between the wind farm and the night - time landscape of the area.
- Motion detectors should be used to activate night - time security lighting when required.

Dust Control

- Undertake staged clearing of vegetation to limit the number of open areas causing erosion / wind-blown sand during construction,
- Consolidate roads and reduce the need for clearance of large areas of ground cover vegetation for roads.
- Allow tracks and lay downs to visually soften through the establishment of naturally generating grass /vegetation cover over their surface, and
- re-vegetation of any cleared areas no longer required.

5.1.5 MITIGATION EFFECTIVENESS

Mitigation measures when incorporated into the design process, such as those outlined above will have a positive effect on reducing the visual impact of the proposed wind farm. The effect of measures will be greatest for sensitive static viewpoints such as residences lacking existing screening vegetation.

6.0 CONCLUSION

6.1 CONCLUSION

6.1.1 PERCEPTIONS OF CHANGE

A key consideration in the assessment of visual impact will be the perception of local residents to the distinctive elements of the project that evoke a variety of responses. Whilst the degree to which a development the scale of the proposed King Rocks Wind Farm is visible from certain vantage points can be quantified, the degree to which the viewers will be impacted is influenced by an individual's perceptions of what change will bring.

Regardless of the visual prominence of turbines, the community's perception of the importance of their function may impact on their perceived visual impact and therefore on the extent of visibility that is acceptable. For example, towers designed to provide safety, including lighthouses and airport control towers, may be perceived favourably. Wind turbines may be perceived favourably in communities in which renewable energy is considered valuable.

Acceptance of the wind farm will vary widely depending on the viewer's preferences and biases. The residents and users of the landscape surrounding the site will reflect a range of sensitivities.

6.1.2 LEVELS OF IMPACT

The project will change the landscape of the setting at the local, sub regional and, to a lesser extent, the regional level. The landscape character of the study area exhibits a range of scenic qualities from low to high. The project area occurs predominately within a landscape characterized by broad, cleared agricultural plains with few topographic variations which is assessed as having low level of scenic quality.

The analysis identifies that the project site will have a wide visual catchment area. This is due to a range of factors including the height of the turbine structures, the open rural pasture land landscape, limited areas retained (tall) vegetation and typically flat topography of the proposal area.

The visual impact assessment identified the 16 vantage points as areas of low, low/moderate, moderate, moderate/high and high visual impact.

Where the project has the potential to create a moderate visual impact or greater, mitigation measures should be explored on a case by case basis in consultation with the effected stakeholder, and a qualified landscape architect.

Low and Low/Moderate Visual Impact

The project development will have a low or low/moderate impact on vantage points where it is visible but does not attract attention and blends in well with the surrounding landscape. These locations may be visually sensitive however mitigated by distance or frequency. The development when viewed from these locations will not detract greatly from the view experience.

Moderate Visual Impact

The visual analysis identified locations within the study area where a moderate level of visual impact will result from the proposed development including:

- PHOTO SIMULATION LOCATION 2 - Property 2;
- PHOTO SIMULATION LOCATION 3 - Property 4;
- PHOTO SIMULATION LOCATION 4 - Property 5;
- PHOTO SIMULATION LOCATION 5 - Property 8;
- PHOTO VIEW LOCATION 1 - Property 6; and
- PHOTO VIEW LOCATION 4 -The Humps.

The proposed development will introduce elements that will be present in the mid-ground but do not dominate the view. The subsequent effects are considered to result in a moderate visual impact. It may be necessary to mitigate these impacts, particularly where they are present in close proximity to houses located on a property and it is the preference of the property owner for mitigation measures to be introduced.

From the majority of residential and road viewpoints, views to the site will be filtered by existing vegetation. Therefore, minor alterations to the location of, and number of turbines, will not result in significant changes to the level of impact.

Off-site landscaping/vegetation screening when placed in close proximity to the viewer will provide the best form of mitigation in these circumstances.

Many of the properties in the area have a dense band of vegetation surrounding the immediate residence which help to contain the viewshed from the house and surrounding living area itself, blocking more distant views.

Where the view location will result in a moderate impact from within a property, the impacted property owner should be consulted and where required additional screening vegetation can be installed to reduce impacts for key viewpoints within the house.

Additional properties surrounding the identified viewing locations (such as property 3) will likely be effected in a similar way and should be consulted with regard to off-site vegetation screening in their vicinity.

For people travelling through the study area, roadside vegetation is effective in reducing the level of visibility particularly as there focus is typically on the road ahead. Where significant gaps in roadside vegetation exist in sensitive areas, off-site planting can be installed to assist in reducing visual impact.

Moderate/High Visual Impact

The visual analysis identified two locations within the study area where a moderate/high level of visual impact will result.

- PHOTO SIMULATION LOCATION 1 - Property 1.
- PHOTO SIMULATION LOCATION 6 - King Rocks.

For Property 1, the proposed development will introduce elements that will be present in the mid-foreground and middleground in this location and have the potential to dominate the view. This location is identified as a project involved property and as such residents are considered to be less sensitive to visual change.

The King Rocks location is identified as having high scenic quality. The proposed development will introduce elements that will be present in the middleground within the open landscape setting, lacking surrounding screening from an elevated vantage point and within 5 to 10 km. The turbines may dominate a portion of the view and visual impact will be moderate/high.

It is inevitable that the placement of wind turbines within the landscape will alter the existing visual character of the area to some degree. The surrounding landscape character which characterises the Hyden area (in particular the rural pastureland landscape) will remain dominant elements in the landscape regardless of the proposal. As the viewing location offers 360 degree views, the option to look in an alternate direction towards an unaltered landscape character of a similar nature will remain.

Additionally, depending on the viewer and their perception of renewable energy, the project site may have a positive effect and draw people to this location for an elevated viewing opportunity of the wind farm.

6.1.3 CONCLUSION

While the social, environmental and economical benefits of the proposed wind turbines will outweigh the identified visual impacts associated with selected vantage points in the study area, it is necessary to mitigate the impacts. In areas where amelioration of views to the wind farm may be required, planting may be implemented between the viewing location and the source of intrusion, to achieve effective screening. It should be recognised that given the scale and height of wind turbines that visual screening within a setting is most effective when the screening is close to viewing points.

Key initiatives to assist in mitigating the visual impact of the proposal include:

- to minimise the colour contrast in the landscape to allow new structure to blend into the existing setting,
- to recognise the role of topography and vegetation patterns in the landscape to hide proposed development components,
- to minimise the loss of existing screen vegetation and changes to existing patterns of vegetation, and
- to provide new screening vegetation in close proximity to the viewer at specific locations to development which can blend into the landscape.

7.0 PHOTO-SIMULATION PROCESS

7.1 PHOTO-SIMULATION PROCESS INFORMATION

DATA SOURCES

Camera Equipment:

- Camera body: Nikon D7100 - 24.1MP DX format CMOS sensor
- Lens: Nikon AF-P DX 18-55MM F3.5-5.6G VR

Software:

- ArcGIS
- AutoCAD 2021 LT
- Google Earth Pro
- Sketch-up Pro 2020
- Photoshop CC 2022

Data Sources

- Google Earth Imagery (2018-07-12)
- Site feature survey received via client
- Proposed structure dimensions from client
- Surveyed locations of photo viewpoint locations (2022-03-23 to 2022-03-24)

METHODOLOGY

Photo-simulations provided on the following pages have been produced with a high degree of accuracy. The process for producing these photo-simulations are outlined below:

Photographs have been taken on site using the above listed equipment to obtain high resolution photos whilst minimising image distortion. Photos are taken with the camera mounted to a tripod, at a standing height of 1.55m above natural ground level or above floor level. A combination of aerial and GPS data has been used to record the locations of the camera setup at each viewpoint location. Photos have generally been taken at a standard focal length of 50mm (full frame equivalent) or at 35mm (full frame equivalent) to cover a wider context. Where photos are wider than a 50mm focal length, a 50mm reference window is provided to assist with standardising the set for a standard view. A photo taken using the 50mm focal length on a full-frame

camera (equivalent to 39.6° horizontal field-of-view) is considered an accepted photographic standard to approximate human vision.

Available geo-spatial data for the site listed above are combined to form a geo-referenced base 3D model from which additional information, such as proposed build forms, landscape and photographic viewpoints can be inserted.

Details of the proposed development are obtained from the client. All models are registered to their correct geo-location in the base 3D model.

For each photo being used for the photo-simulation, the photo's taken location and focal length is extracted, and matched in the 3D base model. A camera match is created by aligning the 3D camera with the 3D base model against the original photo, matching the original photographic location and orientation.

From each viewpoint, the final photo-simulation is then produced by compositing 3D rendered images of the proposed development into the original photo with editing performed to sit the render at the correct view depth. Photographic elements are cross-checked against the 3D model and reference materials to ensure elements such as foreground trees and buildings that may occlude views to the proposed development are retained. Conversely, where trees/buildings may be removed as part of the proposal, these are also removed in the photo-simulation.

DISCLAIMER

This Visual Impact Assessment is dated **April 2022** and incorporates images, data, information up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Pty Ltd's (Urbis) opinion in this Assessment.

Urbis is under no obligation in any circumstance to update this Visual Impact Assessment for events occurring after the date of this Visual Impact Assessment. Urbis prepared this Visual Impact Assessment on the instructions, and for the benefit only, of **Synergy RED** (Instructing Party) for the purpose of determination of a **Development Application** (Purpose) and not for any other purpose or use. To the extent permitted by applicable law, Urbis expressly disclaims all liability, whether direct or indirect, to the Instructing Party which relies or purports to rely on this Visual Impact Assessment for any purpose other than the Purpose, and to any other

person which relies or purports to rely on this Visual Impact Assessment for any purpose whatsoever (including the Purpose).

In preparing this Visual Impact Assessment, Urbis was required to make judgements which may be affected by unforeseen future events, the likelihood and effects of which are not capable of precise assessment.

Urbis has recorded any data sources used for this Visual Impact Assessment within this Visual Impact Assessment. These data have not been independently verified unless so noted within the Visual Impact Assessment.

All projections and models contained in or associated with this Visual Impact Assessment are made in good faith and on the basis of information supplied to Urbis at the date of this Visual Impact Assessment, and upon which Urbis relied.

Whilst Urbis has made all reasonable inquiries it believes necessary in preparing this Visual Impact Assessment, it is not responsible for determining the completeness or accuracy of information provided to it. The visual image in this Visual Impact Assessment showing the proposed new building structure in situ after construction is complete, is an estimate only of its possible visual impact. The actual visual impact of the new building may be impacted by a number of variables including amongst others the actual location of the building structure on the site, the topography of the site and the final height of the fully constructed building structure.

Urbis (including its officers and personnel) is not liable for any errors or omissions, including in visual representations of the completed building structure in situ, in information provided by the Instructing Party or another person or upon which Urbis relies, provided that such errors or omissions are not made by Urbis recklessly or in bad faith.

This Visual Impact Assessment has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this Visual Impact Assessment are given in good faith and in the reasonable belief that they are correct and not misleading and taking into account events that could reasonably be expected to be foreseen, subject to the limitations above.

8.0 REFERENCES

8.1.1 ASSESSMENT REFERENCES

- Department of Planning and Infrastructure (DPI) (2007) Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design. Western Australian Planning Commission, Perth.
- Australian Institute of Landscape Architects (AILA) (2018) Guidance Note for Landscape And Visual Assessment: AILA.
- Department of Planning Lands and Heritage (DPLH) (2020) Position Statement: Renewable energy facilities - March 2020. Western Australian Planning Commission, Perth.
- Department of Primary Industries and Regional Development (DPIRD) (2022) 2m Contour Dataset in PDF and DWG format.

