MORTLAKE ENERGY HUB

VISUAL IMPACT ASSESSMENT

PREPARED FOR
BRIGHTNIGHT POWER
APRIL 2024
FINAL FOR ISSUE

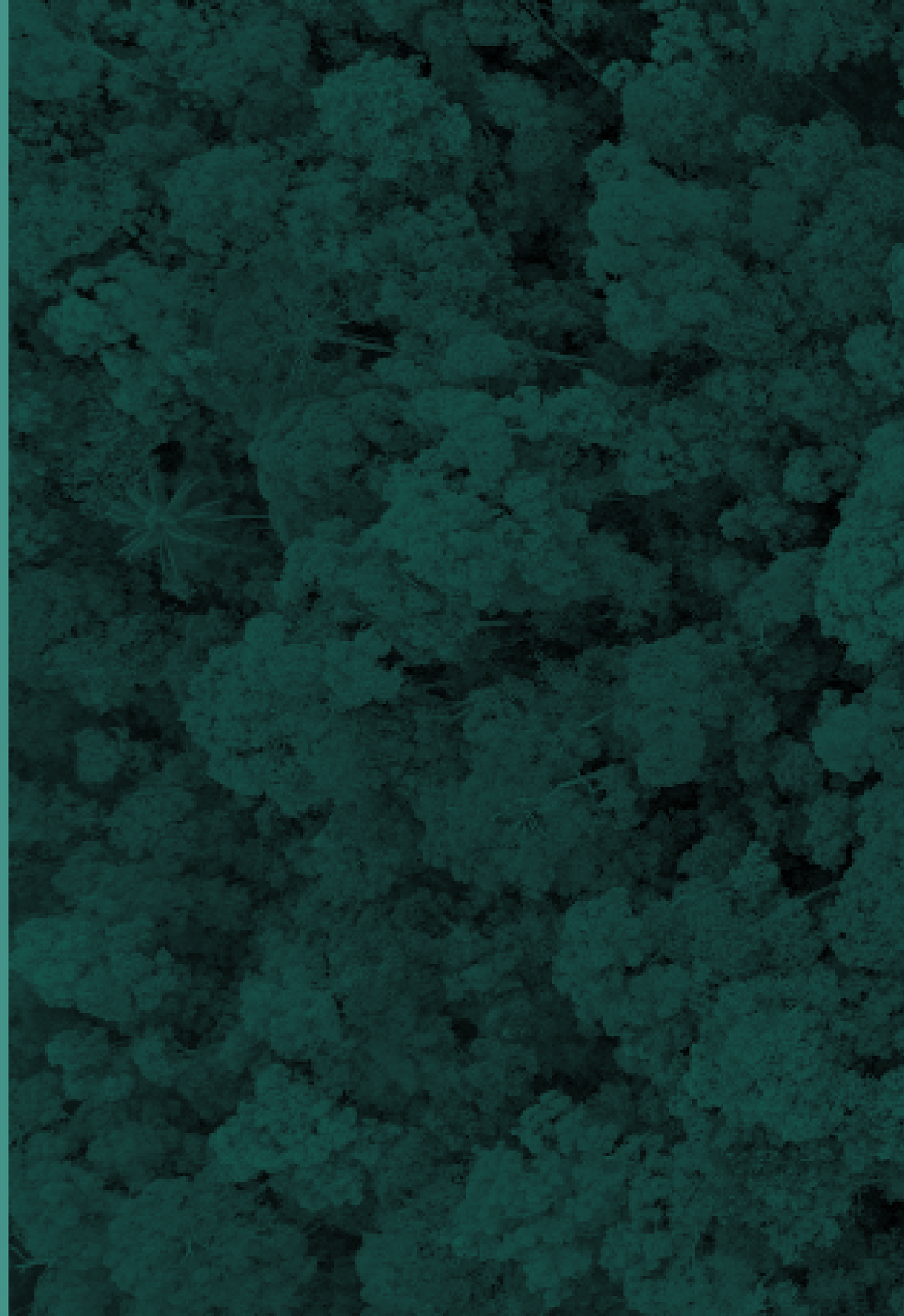
URBIS

ACKNOWLEDGMENT OF COUNTRY

Urbis acknowledges the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

We acknowledge the Traditional Owners on whose land we stand, the Eastern Maar peoples of south-western Victoria.

We recognise and respect the connection to their land, cultural heritage and community, and we pay respects to their Elders past, present, and emerging.



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Project Code:	P0040707
Reference:	P0040707_MortlakeSF_VIA_Report
Version:	Rev B
Report Status:	For Issue
Date:	04/26/24

We acknowledge Aboriginal and Torres Strait Islanders as the traditional custodians of all the lands throughout Australia. We recognise and respect the connection to their land, cultural heritage and community, and we pay respects to their Elders past, present and emerging.

CONTENTS

EXECUTIVE SUMMARY

This Landscape and Visual Impact Assessment (LVIA) has been prepared by Urbis to assess potential impacts associated with a planning permit application to use and develop land for a solar energy facility (renewable energy facility) and BESS facility on land to the north-west of Mortlake in South-west Victoria.

Indicative models prepared by Urbis have been used in the preparation of 6 photomontages from 6 view places which demonstrate a range of representative sample views from within the site's visual catchment.

Selected views were further analysed to determine the extent of visual change, the effects of those changes on the existing visual environment and landscape character, and the importance of those changes, being the final rating of impact.

Visual effects were assessed without mitigative landscaping to determine the level of impact based on a 'worst-case scenario'. Photomontages have been prepared to show an indicative level of screening that will occur 5 years from establishment.

FINDINGS

- View place sensitivity was rated as **low or low-medium** in 5 of the 6 views modelled. The long term visual effects and overall impact on places of higher sensitivity was found to be low given the screening effects of on-site amelioration.
- The existing visual environment and landscape setting was found to have a high capacity to visually absorb the proposal, including the proposed BESS facility which will be effectively screened by surrounding vegetation. The landscape character of the Western Volcanic Plain will therefore remain fundamentally unchanged.
- The proposal was found to be highly compatible with the Future Landscape Character Directions and Landscape Protection and Management Objectives and Guidelines and the Western Volcanic Plain, given its constrained height and its location within a flat landscape.
- The proposed on-site amelioration was also found to be visually consistent with established planting patterns within this part of the Western Volcanic Plain and is compatible with management guidelines for the area.
- In all views modelled the visual effects of the proposal were found to be **low** for the majority of factors, and the overall rating either **low or low-medium.**
- The overall visual impact for all views modelled was found to be **low.**
- Additional lighting impacts generated by the proposal were found to be **low.**
- Based on the recommended resting angles 12° and 60° (inclusive) for the proposed panels there will be no glare predicted from any assessed receptor.
- Residual visual impacts including the effects of on-site amelioration, were found to be **low and acceptable** given the low level of visual change and overall long term compatibility with the surrounding landscape character. The proposal does not create any significant adverse visual effects on the wider landscape character of this part of south-western Victoria.

The proposal is therefore supported on visual impact grounds.

01 INTRODUCTION

1.1 PURPOSE OF THE REPORT

Urbis Ltd (Urbis) has been engaged by BrightNight Power to prepare a Visual Impact Assessment (VIA) to accompany a planning permit application to use and develop land for a solar energy facility (renewable energy facility) and Battery Energy Storage System (BESS) facility, on land to the north-west of Mortlake, Victoria.

The VIA follows an objective, logical process to determine the importance of the extent of the visual change in relation to the local and wider visual context.

This VIA includes a methodology statement regarding the preparation method and accuracy of photomontages. The photomontages prepared by Urbis included in this report have informed the analysis of visual effects and impacts.

1.2 PROPOSED DEVELOPMENT

The subject site is located approximately 8km north-west of Mortlake and south of Hexham, some 170km south-west of greater Melbourne. The maximum site area is bound by several local roads including Thulborns and Booth Lanes to the south, Hamilton Highway to the east and north-east and Boonerah Estate Road to the north-west and Hardys lane to the west.

The project involves the development of pastoral land to deliver a 360MW solar energy facility and utility station (600MW BESS facility). The solar energy facility includes a panel area of 240 hectares (7.5% of the main site) and the BESS facility 216 40ft containers, to be located on the smaller, adjoining site south-west of the panel area.

An existing substation is located approximately 2.7km south-west of the site area, where is proposed to locate a new BESS facility and connection point. A 33kV underground cable will run from the existing substation traverse through the centre of the site in a north-easterly direction.

1.3 THE PROJECT IN VISUAL TERMS

The project area is an irregular shaped site west of Hamilton Highway and includes two smaller adjoining parcels that extend south and south-west of the southern boundary of the main site. A separate parcel located further south-west (approximately 2.7km) is reserved for the proposed BESS facility.

The larger parcel of land (eastern parcel) runs adjacent to Hamilton Highway, which is located immediately north-east of the site. The remaining frontages include Boonerah Estate Road (part west), Hardys Lane (part north), Thulborns Lane (part south) and Booths Lane (part east). The site is set in from Connewarren Lane (south) by approximately 1km at the closest point.

The solar energy facility includes 705,705 photovoltaic panels, the majority of which will be located on the larger, main site east of Hamilton Highway. The facility has been designed to minimise physical impacts to native vegetation, waterways, Aboriginal cultural heritage and easements, with panels located in the eastern and western areas of the site and large sections of land within the site undeveloped.

The panels will be separated into 3 sections, Site A, B and C. Site A, the smallest of the three sites will occupy the reduced parcel to the south-west, Site B and C will occupy the areas north and south of access road Boonerah Estate Road, respectively. Site B and C will have a frontage to Hamilton Highway.

A boundary fence will enclose each site. The panels are flat and rectangular glass surfaced panels attached to pile driven mounting frames. The panels will be attached to a horizontal 'tracker' which allows the panels to track the sun by pivoting in the east/west plane to maximise solar exposure. The panels are just below 3m in height at maximum tilt.

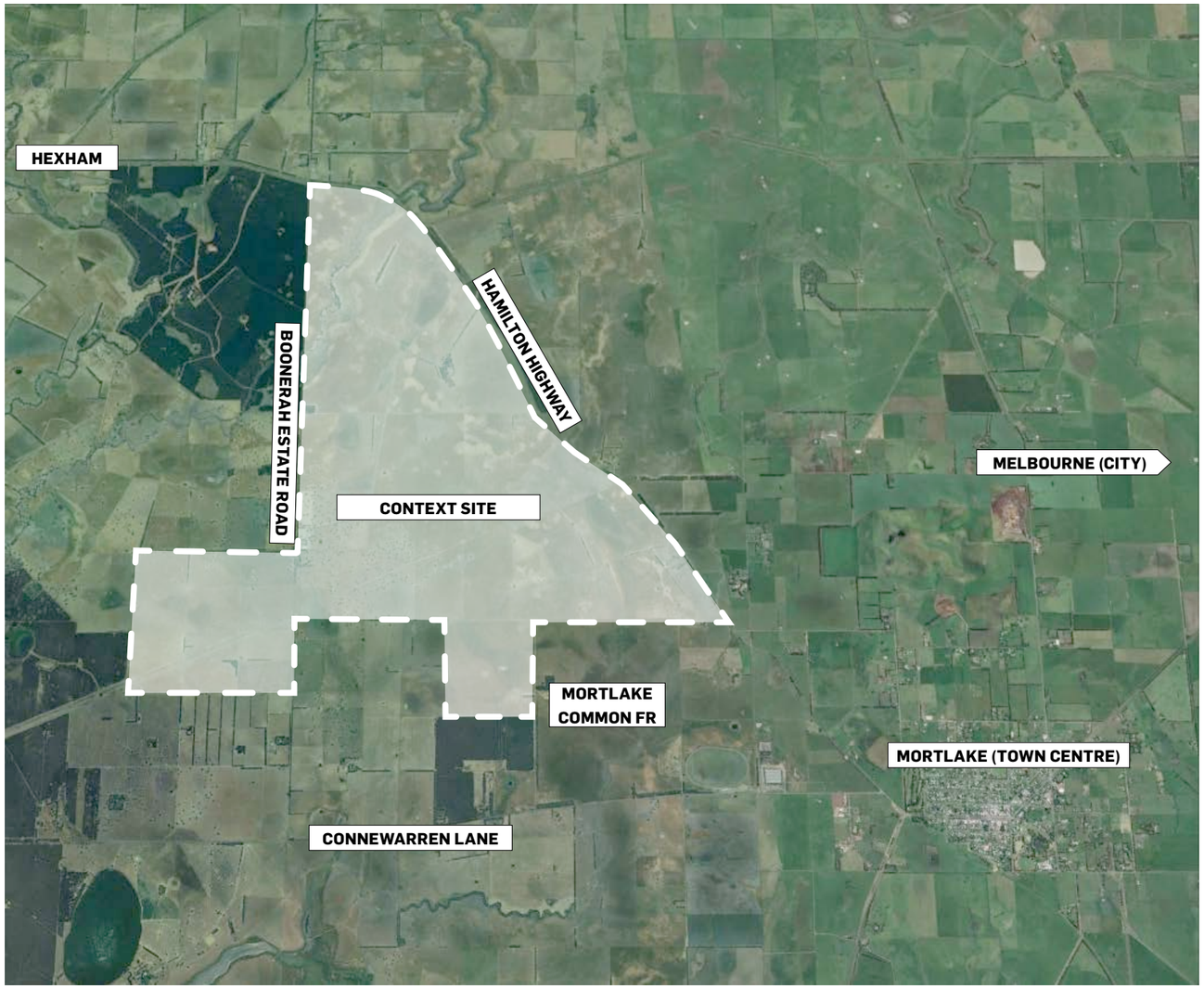
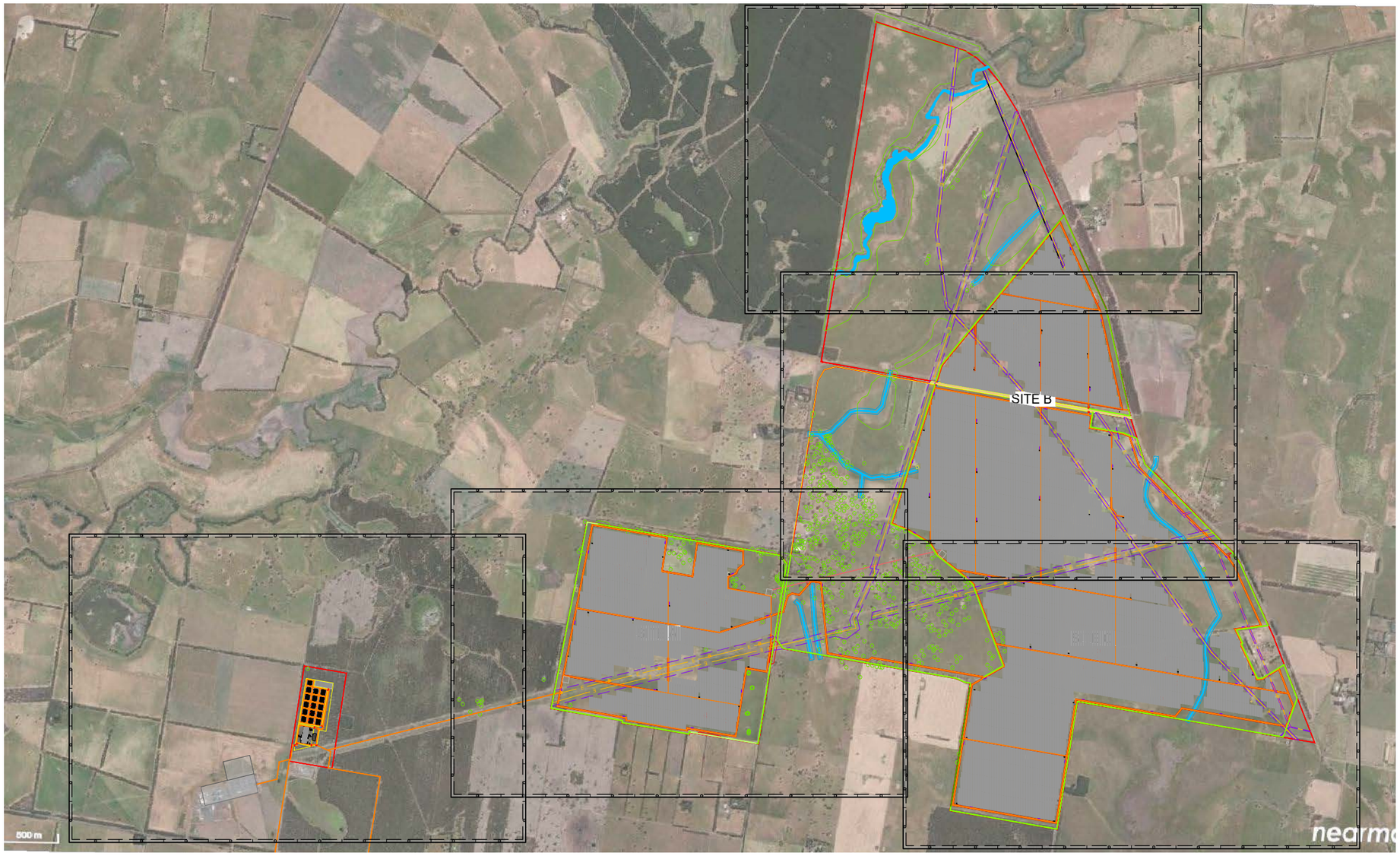


Figure 1 Site location and surrounding context.

MORTLAKE ENERGY HUB
SITE PLAN



PROJECT DETAILS	
BOUNDARY AREA	1883 Ha
PANEL AREA	240 Ha (7.5% of site area)
GATES	11
DC CAPACITY	TBC
AC CAPACITY	TBC
PV MODULE	795,333 x Canadian Solar BiHiKu7 CS7N-660MB-AG
2-STRING TRACKER	1216
3-STRING TRACKER	7223
SOLAR INVERTER	45 x FREESUN HEMK 690V FS4390K
BESS INVERTER	N/A x FREEMAQ PCSK 690V FP4390K
ROW DISTANCE	5.5m PITCH
FENCE LENGTH	26,072m

GENERAL LEGEND

- DEVELOPMENT BOUNDARY
- BOUNDARY FENCE
- OVERHEAD CABLE 33kV
- UNDERGROUND CABLE 33kV
- ACCESS ROADS
- PUBLIC ROADS IN RESERVE
- EXTERNAL VEGETATION BUFFER (5m)
- INTERNAL FIRE SAFETY BUFFER (10m)
- EXISTING EASEMENT POWERLINES SET WITHIN
- OVERLAND FLOW PATH
- PASSING BAYS
- GATES
- W.T 45,000L WATER TANK (12)
- W.T 288,00L WATER TANK (1)
- INV. SKID SOLAR INVERTER
- EXISTING VEGETATION - REMOVED
- EXISTING VEGETATION - RETAINED

2-STRING TRACKER (1216) - 66 PANELS

3-STRING TRACKER (7223) - 99 PANELS

Figure 2 Site plan showing parcels A, B and C.

Figure 4 Typical landscape character views from Hamilton Highway including established patterns of vegetation.

Figure 3 Typical landscape views from Hamilton Highway, characterised by open, flat plains.

02 METHODOLOGY

2.1 APPROACH

In the absence of any specific legislative requirements for the methodology employed to assess Solar Farms and associated works in Victoria, Landscape and Visual Impact assessment typically follows guidance set out in the following:

- Guidance for Landscape and Visual Impact Assessment (LVIA), Third Edition, Landscape Institute of Environmental Management & Assessment (2013).
- Guidance Note for Landscape and Visual Assessment, Australian Institute of Landscape Architects (AILA), (2018).

The methodology used to assess this proposal relies on the above guidelines as well as the Urbis methodology which is based on a combination of widely accepted terminology, practices and established approaches included in multiple LVIA methods, guidelines and objectives. The Urbis methodology is based on a This report assesses landscape and visual impacts of the project which are informed by the visual effects generated by the proposal.

The Urbis method considers other relevant factors such as the underlying strategic planning intent of the site, its immediate or wider setting. For example, other methods do not consider visual compatibility with the existing or desired future character for the site or area which may allow for transformational visual change.

The Urbis method also distinguishes and places 'weight' on key factors such as view place and viewer sensitivity, physical absorption capacity etc. and considers impacts on unique settings near the site that could be potentially affected, including for example heritage items, conservation areas, views to icons and areas of high scenic quality.

The measurement of visual impacts is based on a combination of viewer sensitivity, relative to the proposed visual change, or magnitude of the proposal on a particular composition or visual setting.

This assessment is structured into the following study components:

- Review of the proposal and consideration of potential visual impacts.
- Characterisation of the existing landscape and visual setting.
- Qualitative assessment of:

(a)The visual modification at key representative viewpoints – understanding how the proposal would contrast with the landscape character of that visual setting.

(b)Viewer sensitivity at key viewpoints – how sensitive would viewers be to the proposal from a particular location.

- Potential lighting impacts.
- Potential glint and glare impacts.
- Recommendations as to visual impact mitigation measures.

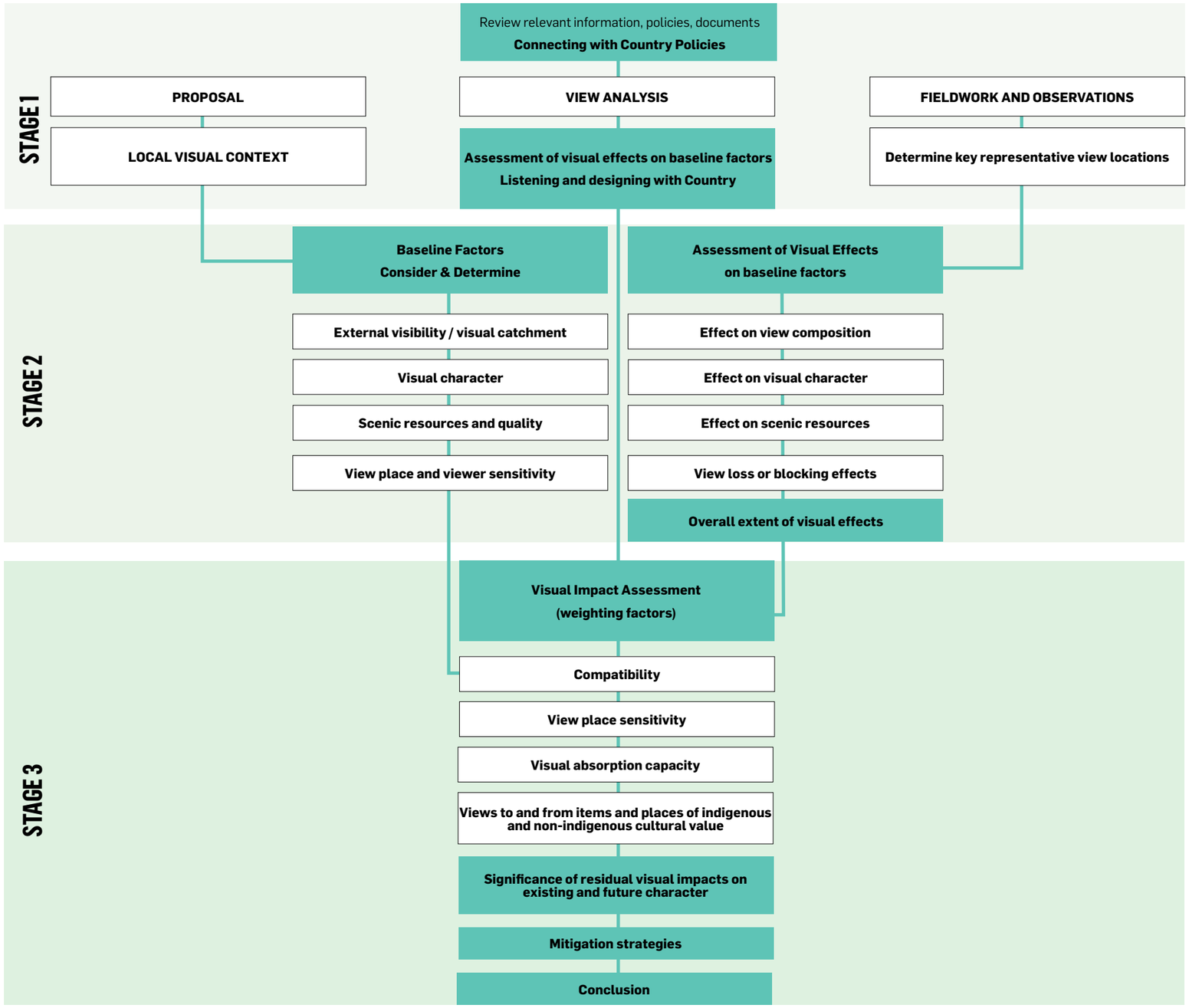


Figure 5 Methodology flowchart.

2.2 KEY FACTORS

This assessment relies on the following key terms and factors which should be considered in determining the extent of visual change and the significance of any resultant visual impacts.

Landscape Character

Visual character is a term which refers to predominant visual features that are present in the landscape to an extent that those features can be used as a basis to visually define or separate one area form another.

Landscape character typically relates to a recognisable and consistent pattern of physical and visual elements in a landscape which, when combined separate one landscape area from another. The concept relies on various landscape features such as for example; underlying topography, the presence of water bodies, unique features for example rock outcrops and cliffs, and vegetation. Visual character refers to more than just the physical, visual components in the context and may consider the cultural significance associated with the visual landscape.

The Australian Institute of Landscape Architects (AILA) in Guidance note for Landscape and Visual Assessment 2018 define character as being;

A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, and often conveys a distinctive 'sense of place'.

This approach is mirrored in Guidelines for Landscape Character and Visual Impact Assessment EIA-N04, NSW Roads and Maritime Services, 2018.

The ... *'combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place'.*

Visual Catchment

The potential visual catchment (sometimes referred to zone of visual influence or ZVI for renewable projects) is the theoretical area within which parts of the site and proposal may be visible, and, in this regard, the theoretical visual catchment is typically larger than the area within which there would be discernible visual effects of the proposal. The visibility of any proposed development varies depending on constraints such as the blocking effects of intervening built form, vegetation or topography. In all cases the potential visual catchment is tested as far as practicable with fieldwork observations.

Visibility

Visibility refers to the extent to which any part of the proposal would be physically visible, identifiable for example as a new, novel, contrasting element or alternatively as a recognisable but compatible feature.

Sensitivity

Viewer Sensitivity – Viewer sensitivity is a judgement as to the likely level of private interest in the views that include the proposed development and the potential for private domain viewers to perceive the visual effects of the proposal. The spatial relationship (distance), the length of exposure and the viewing place within a dwelling are factors which affect the overall rating of the sensitivity to visual effects.

For example a 'sensitive viewer' would be considered as a residence located in close proximity of a site boundary with clear, direct potential views to a part of the proposal.

View Place Sensitivity – This factor relates to the likely level of public interest in a view of the proposed development. The level of public interest includes assumptions made about its exposure in terms of distance and number of potential viewers. For example, close and middle-distance views from public places such as surrounding roads and intersections that are subject to large numbers of viewers, would be considered as being sensitive view places. However, the level of sensitivity depends on the nature of the view and whether it is gained from either a moving viewing situation and the duration of exposure to the view for example for short periods of time or for sustained periods.

Scenic Quality

Scenic quality relates to the likely expectations of viewers regarding scenic beauty, attractiveness, or preference. Scenic preferences typically relates to the variety of features that are present, and the uniqueness or combination of those features. Scenic quality of the visual setting of the subject site is a baseline factor against which to measure visual effects. Criteria and ratings for preferences of scenic quality and cultural values of aesthetic landscapes are based on empirical research undertaken in Australia and internationally.

Therefore, analysis of the existing scenic quality of a site or its visual context and understanding the likely expectations and perception of viewers is an important consideration when assessing visual effects and impacts.

Viewing Period

Viewing period in this assessment refers to the influence of time available to a viewer to experience the view to the site and the visual effects of the proposed development. Longer viewing periods, experienced either from fixed or moving viewing places such as dwellings, roads or waterways, provide for greater potential for the viewer to perceive the visual effects.

Cumulative Visual Effects

The extent of visible effects (quantum) of similar types of development which may be visible simultaneously in the same view composition or in sequential views for example from along a road carriageway or across and within the same visual catchment of a project site.

Viewing Distance

Viewing distance can influence on the perception of the visual effects of the proposal which is caused by the distance between the viewer and the development proposed. It is assumed that the viewing distance is inversely proportional to the perception of visual effects: the greater the potential viewing distance, experienced either from fixed or moving viewing places, the lower the potential for a viewer to perceive and respond to the visual effects of the proposal.

Physical Absorption Capacity

Physical Absorption Capacity (PAC) means the extent to which the existing visual environment can reduce or eliminate the perception of the visibility of the proposed redevelopment.

PAC includes the ability of existing elements of the landscape to physically hide, screen or disguise the proposal. It also includes the extent to which the colours, material and finishes of buildings and in the case of buildings, the scale and character of these allows them to blend with or reduce contrast with others of the same or closely similar kinds to the extent that they cannot easily be distinguished as new features of the environment.

Prominence is also an attribute with relevance to PAC. It is assumed in this assessment that higher PAC can only occur where there is low to moderate prominence of the proposal in the scene.

Low to moderate prominence means:

Low: The proposal has either no visual effect on the landscape or the proposal is evident but is subordinate to other elements in the scene by virtue of its small scale, screening by intervening elements, difficulty of being identified or compatibility with existing elements.

Moderate: The proposal is either evident or identifiable in the scene, but is less prominent, makes a smaller contribution to the overall scene, or does not contrast substantially with other elements or is a substantial element, but is equivalent in prominence to other elements and landscape alterations in the scene.

Land Use and Zoning

Land use and zoning are additional key considerations which influence the visual setting and character of an area, inform the existing and intended future use, which in turn, determines the existing and desired future character for the site. Land Use and Zoning can help ascertain the compatibility of the proposal with the existing visual environment and influence the significance of residual visual impacts in the context of regulatory frameworks.

2.3 ASSESSMENT OF LANDSCAPE & VISUAL IMPACTS

The landscape and visual impact assessment is based on a detailed analysis and characterisation of the landscape and visual setting, and an assessment of potential impacts within the visual catchment and in relation to that setting (where relevant). The critical factors considered in this LVIA include:

- The number and location of sensitive viewing locations, inclusive of viewer sensitivity and view place sensitivity.
- The viewing period, or duration of the view, and whether that view is experienced from a moving or static viewing situation.
- The visibility of the proposal.
- The scenic quality of the landscape setting;
- The visual compatibility of the proposal with the visual character of the setting; and
- The level of visual change or modification.
- Permanence of the visual change and whether any immediate of subsequent visual impact mitigation can occur.

2.4 VISUAL CHANGE

The level of visual change or modification resulting from a proposed development, or the degree to which the visual setting is modified can be measured by the level of visual compatibility between the proposal and the existing visual environment. Low compatibility will therefore generate a high level of visual change, and high compatibility a low level of visual change. In this regard, the proposed development may be noticeable but does not significantly contrast with the existing visual setting. The level of visual change would generally decrease as distance from the proposal to particular viewpoints increases.

2.5 RESIDUAL IMPACTS

The final question to be answered after all potential mitigation strategies have been considered, is whether there are any residual visual impacts and whether they are acceptable in the circumstances. These residual impacts are predominantly related to the extent of permanent visual change to the immediate setting.

The efficacy of mitigation measures proposed to manage landscape and visual impacts generated by the proposal is determined by comparing the visual impacts during initial operation with the residual impact, when the landscape such as proposed planting, has matured to create effective visual screening, which is typically accepted as being between 7-10 years following initial establishment.

Photo 1. Typical landscape character of surrounding area.

Photo 2. Open rural, pastoral land near the southeast corner of the site (Thulborns Lane, off Hamilton Hwy) typical of landscape surrounding context site.

03 EXISTING VISUAL CONTEXT

3.1 LAND USE & ZONING

3.1.1 ZONING

The site is located within Moyne Shire Council and is zoned Farming Zone (FZ) within the Moyne Shire Planning Scheme. The surrounding land use is zoned predominantly FZ. The objectives of the planning scheme for FZ do not explicitly relate to landscape or scenic protection measures. Nevertheless, the consent authority is required to assess the visual impacts of a proposal on the surrounding area in relation to the existing and future use of the land, given particular zonings will allow for different land uses and as a result will create different visual environments and visual character. Each distinct landscape character will vary in terms of their compatibility with the proposal. The purpose of FZ is outlined as follows:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework*
- *To provide for the use of land for agriculture*
- *To encourage the retention of productive agricultural land*
- *To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture*
- *To encourage the retention of employment and population to support rural communities*
- *To encourage the use and development of land based on comprehensive and sustainable land management practices and infrastructure provision*
- *To provide for the use and development of land for the specific purposes identified in a schedule to this zone*

3.1.2 LAND USE

The land use of the site area and surrounds is predominantly agricultural, cropping and grazing. Minor settlements are located at Hexham (north), Darlington (east), Worndoo (north-east beyond Hexham), Caramut (north-west) and Derrinallum (east of Darlington). The closest and largest residential settlement is Mortlake (south-east) of the site area. Other major towns include Terang (20km south), Camperdown (25km south) and Lake Bolac (25km north).

High voltage transmission lines currently traverse diagonally across the centre of the site from the Mortlake Power Station (south-west of the site) to beyond the eastern side of Hamilton Highway.

South-east of the site area is Mortlake Common F.R Nature preserve and Mortlake Racecourse. The most significant road within the visual catchment of the project area is Hamilton Highway. A number of isolated residential properties are located on the eastern side of Hamilton Highway as well as small quarry along Mortlake-Ararat Road.

Figure 6 Zoning map for subject site and surrounds (FZ) - Farming | Vicplan

3.2 REGIONAL LANDSCAPE SETTING

3.2.1 LANDSCAPE CHARACTER TYPE

The landscape type for the site and surrounding area has been identified using the South-west Victoria Landscape Assessment Study (Planisphere June 2013). The project site is located within:

- *Character Type 1, The Western Volcanic Plain – 1.1 Paddocks and Cones.*

KEY LANDSCAPE FEATURES

- Windswept, flat to undulating agricultural plains
- Volcanic features punctuating the landscape
- Dry stone walls
- Heavily modified landscape
- Sparse settlements
- Numerous lakes
- Exotic and native shelterbelts along property boundaries and paddock lines
- Rich, red volcanic soils

3.3.2 KEY CHARACTERISTICS & SCENIC QUALITY

The predominant visual character of the wider visual context of is formed by the combination of the following key features summarised as follows;

LANDFORM

- Flat to gently undulating, rising up to approximately 20m.
- Relived by volcanic features, the highest of which is Mount Elephant at approximately 200m.
- Abundant geological features including approximately 100 extinct volcanoes.
- Volcanic cones rise from flat pastoral land in a variety of shapes including low rounded rises, steep sloped hills and dramatic peaks and angles.
- Undulating rocky landscapes.

WATERFORMS

- Numerous lakes and swamplands of varying scale.
- Formed by low lying depressions in the relatively flat landscape or ancient volcanic flows blocking creeks and river valleys.
- Water within lakes varies from fresh to brackish and saline, and volcanic marrs often have high mineral concentrations that give them a blue or greenish colouring.
- Major rivers in this area include the Hopkins, Glenelg and Barwon.
- Marshy areas at low points and creeks with local erosion.

VEGETATION

- Open agricultural landscape, mostly devoid of trees.
- Original grassland communities have been replaced by exotic pasture species and monocultural crops, leaving only remnants within roadsides.
- Weed species such as thistles and Pattersons Curse are prolific in fallow paddocks.
- Windbreaks commonly line property boundaries, paddock edges and dwellings, many are Old Pine and Cypress species. Younger shelterbelts of native species are also common.
- Volcanic cones bare of substantial vegetation, can feature a blanket of patchwork cropping, grazing and some shrub like vegetation.
- Bracken and grass species grow between the rocky outcrops of the stony rises where agricultural development is unsustainable.
- Lakes and wetlands support a diversity of aquatic species.

3.4 LOCAL LANDSCAPE SETTING

3.4.1 VEGETATION & LANDSCAPE FORM

The site area is located within a flat to slightly undulating landscape comprising open pastures and cropping land. The site area is predominantly characterised by grasslands and shrubs, however, includes isolated stands of trees, and sections of linear plantings along paddock boundaries. Linear roadside plantings are located along the major surrounding road networks and access lanes. The site includes multiple dams.

Most of the vegetation within the sit consists of open grassland dominated by exotic pasture species, having been cleared historically and ongoing for agricultural land use. Native vegetation consisting of scattered trees and patches of vegetation (grasslands) is primarily restricted to the northern and south-eastern parts of the site. Remnant landscape features including patches of Plains Grassy Woodland were primarily recorded in the south-west of the site and a patch of remnant Floodplain Riparian Woodland is noted in the north-east area of the site, near Salt Creek.

3.5 WESTERN VOLCANIC PLAIN

The pattern of viewing across this part of South-western Victoria is heavily influenced by topography. The majority of views are over flat to undulating plains with volcanic features periodically visible on the horizon. Shelterbelts and linear roadside vegetation constantly filter views across the landscape.

The expansive, predominantly flat aspect of the plain offers long range views and a dominant sense of openness and spaciousness.

The anticipated number of energy proposals within this part of Victoria, will see visual settings of distinctive geological features managed and protected to conserve views in the context of energy infrastructure development.

3.6 PHYSICAL ABSORPTION CAPACITY

The key factors in determining PAC are topography and vegetation.

The volcanic plain is highly sensitive to visual change, where the open, expansive and flat nature of the plain offers long range views. Whilst there is a limited capacity for this character type to absorb development without is becoming prominent, where topography is consistently flat, significant overlooking opportunities across the landscape are limited or not possible. In addition, low height vegetation is able to screen the proposal from many sensitive viewpoints. Where land is undulating or elevated, elevated viewing opportunities increase and mitigative planting (taller species and greater density) is required to be higher and denser to achieve the necessary level of screening. Intervening, undulating landscape also has the potential to block or screen views to the proposal in specific landscapes.

The landscape setting of the proposal and surrounds is consistently flat, and vegetation is limited to linear plantings along roadsides and property boundaries. Overlooking is generally not possible from sensitive view locations and low-height vegetation is effective in screening the proposal.

The existing topography therefore generally has a high PAC, to absorb potential visual change.

Some view place locations for example within or near a cleared agricultural area are sparsely vegetated and as such the existing vegetation has little screening capability and low PAC given it is cleared agricultural area.

3.6.1 DESIGN CONSIDERATIONS: PROPOSED NATIVE VEGETATION REMOVAL

The proposal includes the removal of native vegetation within the site. It is required to remove 18 large scattered trees across 1.812 hectares. Given the sparse vegetation, and its limited screening capabilities, the removal of a limited number of scattered trees will have negligible additional adverse impacts on the absorptive capacity (PAC) of the landscape in relation to the proposal. Further, the limited extent of vegetation removal would not adversely change the intrinsic visual character of the site or significantly negatively affect the scenic quality of views or broader visual setting.

Figure 2 Character Types & Areas

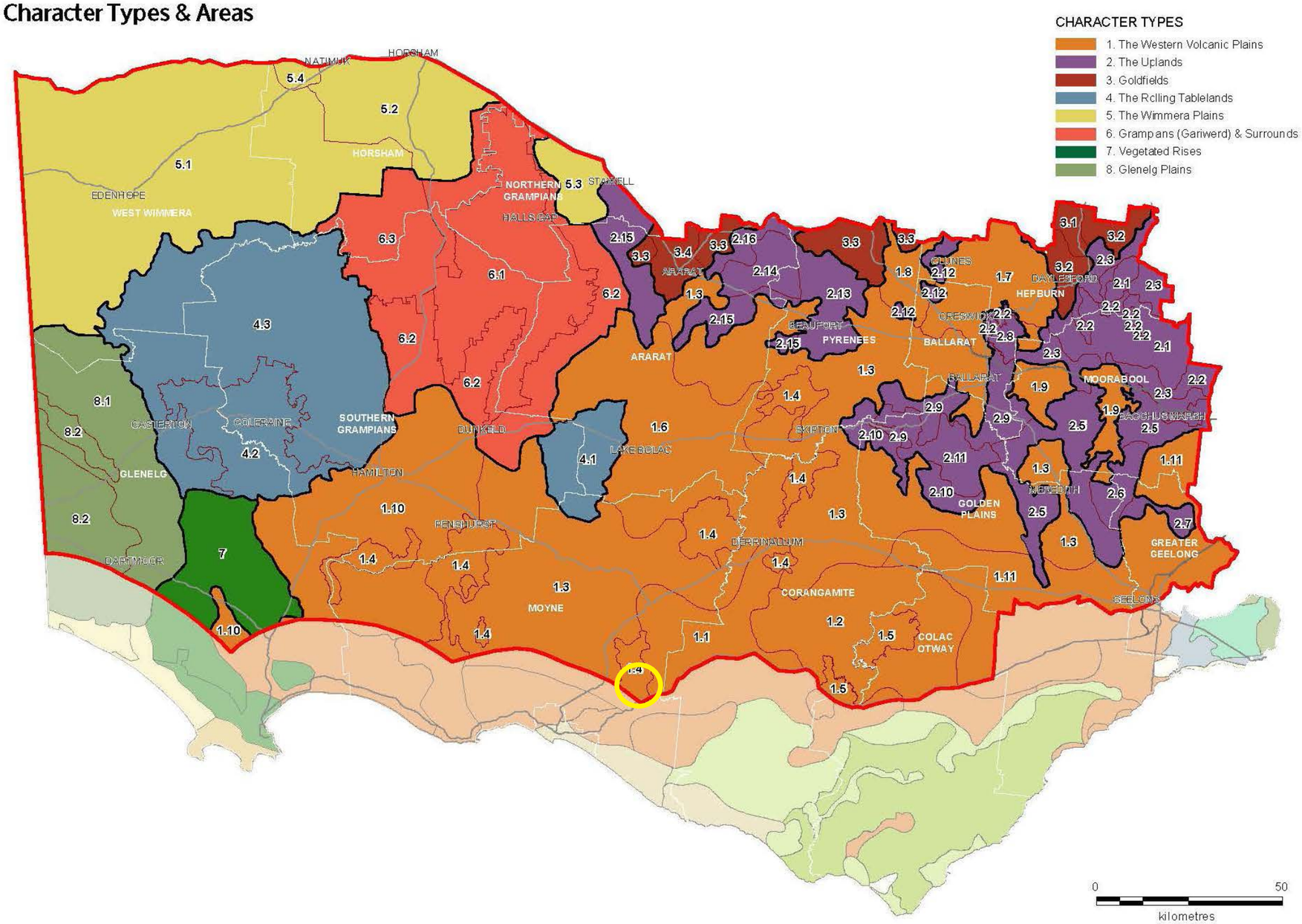


Figure 7 Character Types & Areas Map | Planisphere - Approximate location of subject site within Western Volcanic Plain indicated by yellow circle.

04 THE PROPOSAL

4.1 KEY COMPONENTS

The proposal involves the development of a 360MW solar energy facility and utility installation (600MW BESS facility). The solar energy facility includes a panel area of 240 hectares (7.5% of the main site) and the BESS facility 216 40ft containers, to be located on the smaller, adjoining site south-west of the panel area. Key elements of the proposal are listed below:

- Generation Capacity – Approximately 360MW
- Grid Connection – Connection to existing 500kV line traversing the site
- Storage Capacity – 300MW BESS
- Panel Area – 240 hectares (7.5% of site area)
- Number of Panels – 798, 204
- Number of inverters – 76
- Number of batteries – 261 x 40ft containers
- Number of BESS inverters – 72
- High Security Mesh Fence
- Stock proof fence

For detailed specifications and indicative imagery refer to Appendix E of the Planning Report prepared by Urbis.

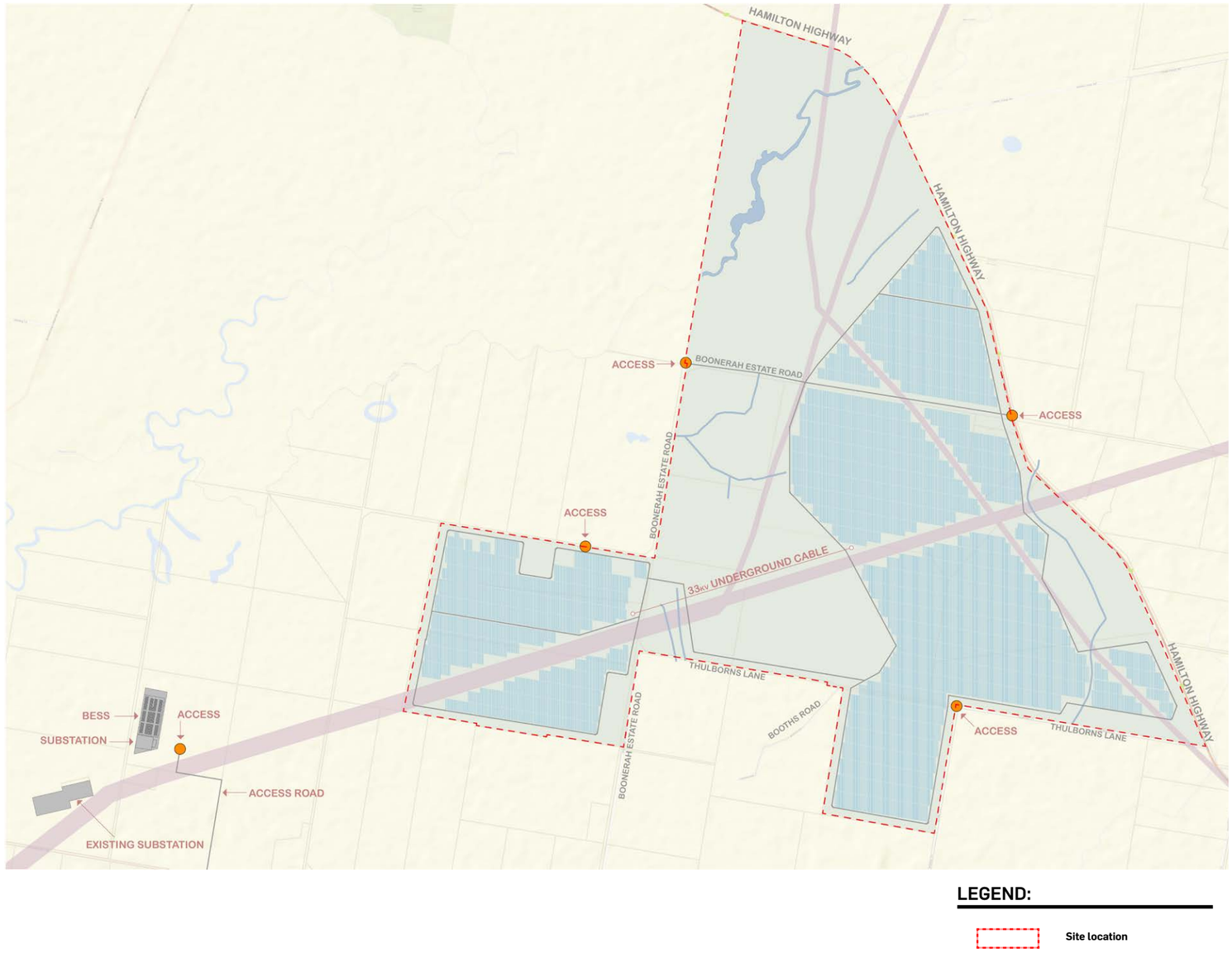


Figure 8 Site Plan | Urbis - Location of site access points, solar panel extent and underground services indicated.

FENCING

Fencing consists of a combination of high security mesh fencing and vehicular access gates, and stock proof fencing. The post and wire fence will be screened by mitigative planting along the outside perimeter of the site.

SOLAR PANELS

The glass surfaced panels are coated to maximise daylight absorption and minimise glare potential. The panels include an encapsulant, silicon solar cells, a backing sheet and aluminium frame. The panels are attached to a horizontal tracker which allows the panels to track the sun by pivoting in the east/west plane, to maximise solar exposure. The mounting frames are pile-driven into the ground.

Visually the panels will appear as dark, flat rectangular panels approximately 3m in height above natural ground level. On mass, the panels will be present as a continuous, low-height, linear horizontal profile within the landscape.

GRID CONNECTION

The BESS will be connected to the grid via a new underground transmission line to the Mortlake Terminal Station. From the Terminal Station, the facility will then have access to the 500 kV transmission line passing through the site to the north-east and south-west.

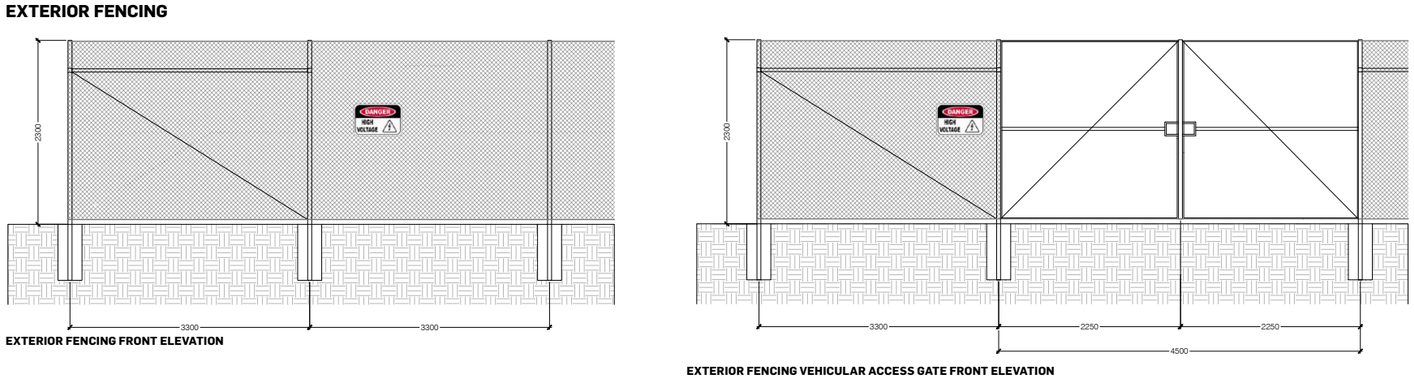


Figure 9 Indicative specifications for proposed high security mesh fence.

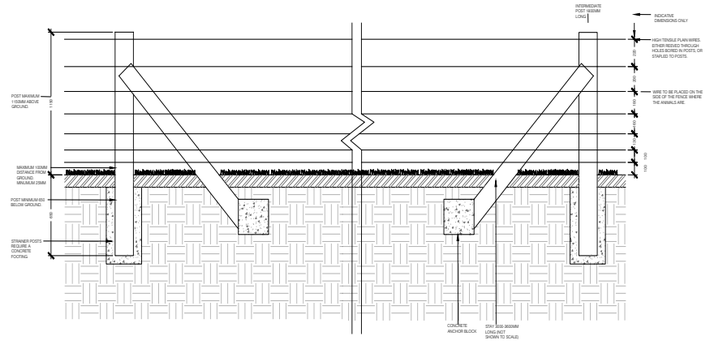
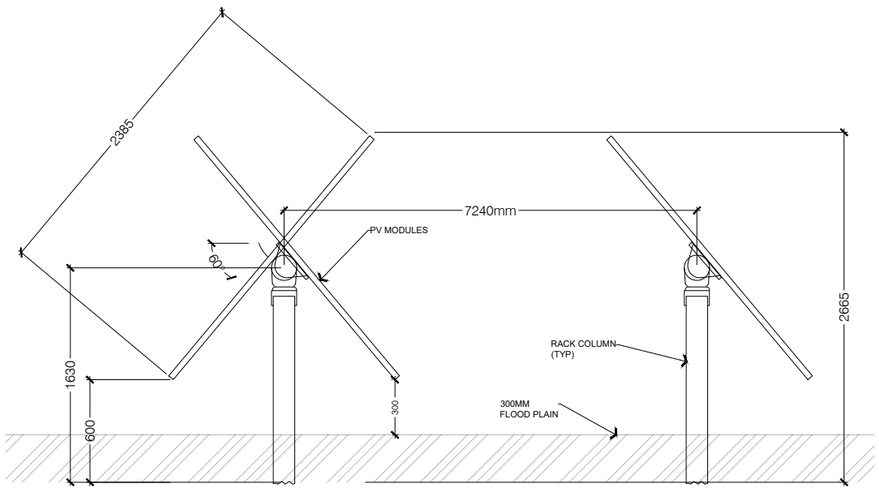
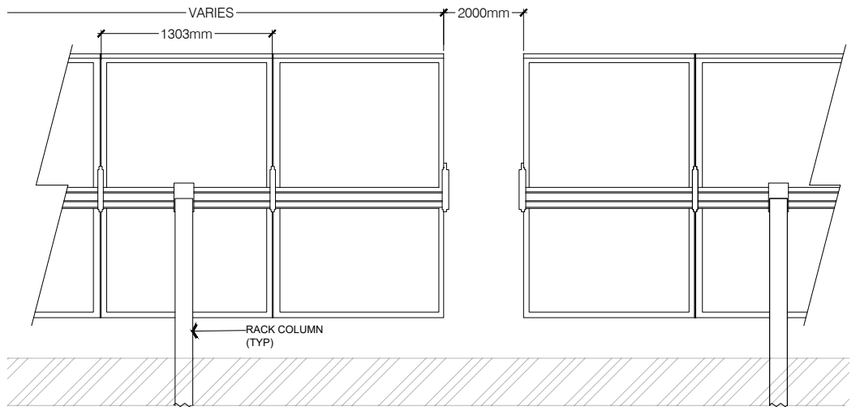


Figure 10 Indicative specifications for proposed fencing.

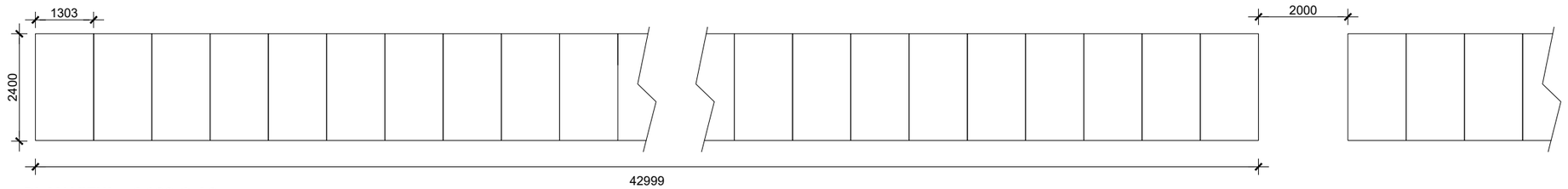
INDICATIVE SOLAR PANELS & TRACKER



SIDE ELEVATION 1:40 @ A3



FRONT ELEVATION 1:40 @ A3



PLAN VIEW 1:100 @ A3
Solar panel table lengths as per site plan

Figure 11 Indicative specifications for solar panels, horizontal tracker and mounting frames.

05 VISUAL EFFECTS ANALYSIS

5.1 VISUAL CATCHMENT

Prior to undertaking fieldwork, Urbis undertook a desktop review of all relevant statutory and non-statutory documents, an analysis of aerial imagery and topography and LiDAR data to establish the potential visual catchment to inform fieldwork inspections.

The visual catchment is potentially expansive given the low flat nature of the surrounding landscape. The potential visual catchment has been tested during fieldwork inspections and re-confirmed via a view shed analysis prepared by Urbis (Figure 12).

The site boundaries are defined by a number of local roads and one main high volume carriage to the west Hamilton Highway which will provide public access to potential views across parts of the site.

To the west, Boonerah Estate Road is a narrow public road characterised by sections of continuous vegetation along its central and northern sections which appears to provide access to several local residential dwellings. Thulborns and Booth Lanes are both unsealed paper roads and as we anticipate limited vehicle traffic and subsequently a limited capacity to access close views of the proposal.

The greatest potential visibility to any part of the subject site and proposal will be in moving viewing views from Hamilton Highway.

5.2 VIEWPOINT SELECTION

Following desktop view shed analysis, the identification for all residential dwellings with in 5km of the subject site boundary and fieldwork observations Urbis selected and recommended 6 public view locations for further analysis and assessment. These views represent the 'worst-case' scenario, and close locations to the site. .In this regard the level of visibility and overall impact is over-represented if compared to visibility across the entire potential visual catchment or view shed.

The selected viewpoints are from locations of higher sensitivity including close residential properties and the surrounding road network. Given the low profile of the proposal, sensitive locations within the visual catchment have been selected for further analysis from within 1km of the project area.

The selected locations are a representative sample of views, for which photomontages have been prepared to demonstrate the visual effects at the potentially highest impact viewpoints.

The photomontages show the visual effects of the proposal at completion, without proposed screen planting. Additional photomontages have been prepared to show the visual effects of the proposed mitigative planting at 5 years post installation.

SELECTED VIEW POINTS

View No.	VIEWPOINT LOCATION
View 01	View south-east from Hardys Lane
View 02	View west from Hamilton Highway
View 03	View north-west from Boonerah Estate Road
View 04	View west from entrance to residence on Hamilton Highway
View 05	View south-west from entrance to residence on Hamilton Highway
View 06	View north-east from residence on Boonerah Estate Road

5.3 PREPARATION OF PHOTOMONTAGES

The method of preparation is outlined in Appendix 3 of this report.

High-resolution fieldwork photographs were captured by Urbis.

The accuracy of the locations of the 3D model of the proposed development inserted into digital photographs has been checked by Urbis in multiple ways:

1. The model was checked for alignment with respect to the 3D survey reference markers which are visible in the images.

2. The location of the camera in relation to the model was established using the survey model and photo geo-locations. Focal lengths and camera settings in the meta data of the electronic files of the photographs are known.

3.Reference points from the survey were used for cross-checking accuracy in all images.

4.No significant discrepancies were detected between the known camera locations and those predicted by the computer software. Minor inconsistencies due to the natural distortion created by the camera lens, were reviewed by Urbis and were considered to be within reasonable limits.

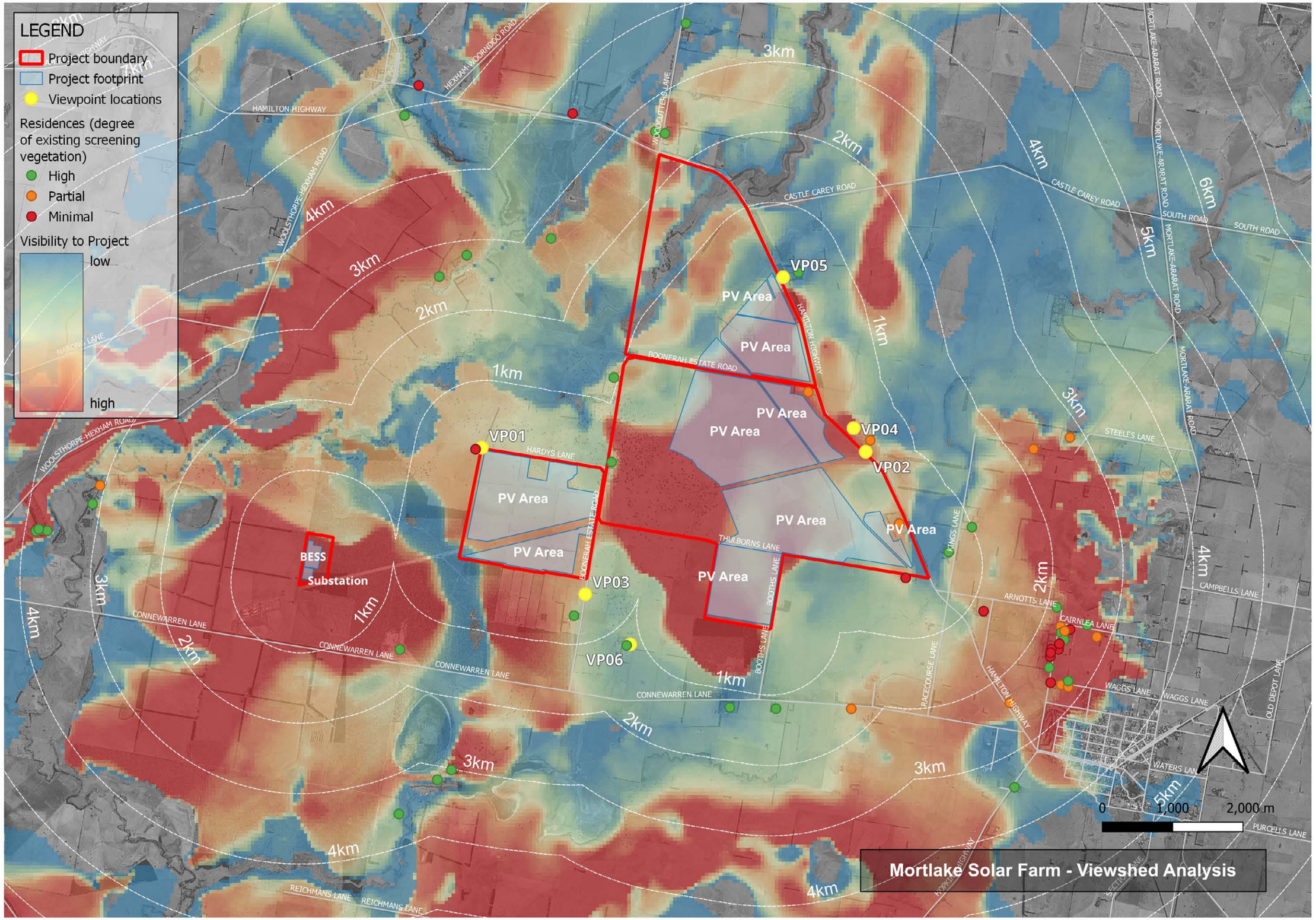


Figure 12 Viewshed Mapping | Urbis - Showing potential visibility (based on topography only).
Mortlake Solar Farm - LVIA

Figure 13 View Location Map | Urbis

VIEW 01

VIEW SOUTH-EAST FROM HARDYS LANE

DISTANCE CLASS

- Close
- 140m

EXISTING COMPOSITION OF THE VIEW

VP1 is a view from Hardys Lane, approximately 140m northwest of the subject site. The existing view includes open, pastoral land which is largely devoid of vegetation and built forms. The background composition includes a high voltage transmission line and pylons across a relatively flat open landscape. We note the presence of continuous dense vegetated land-sky horizon in the distant background, which defines the extent of the composition.

VISUAL EFFECTS OF THE PROPOSED DEVELOPMENT ON THE COMPOSITION AS MODELLED

The view is representative of typical potential views for road users. The composition modelled also indicates the potential composition available to residents at a nearby dwelling to the west, noting that views from internal locations are significantly more constrained. Views from VP1 will include part of the solar panel installation, characterised by a long, low continuous horizontal form (a novel feature) that sits significantly below the background vegetated horizon. In this regard the majority of the key visual elements in the view such as the open foreground pastoral space, individual trees and the continuous vegetated horizon are not blocked so that the intrinsic visual character of the view is retained. The proposed development does not block any unique, identified or, documented, views and predominately blocks areas of open vernacular pastoral landscape.

Visual effects of proposed development	
Visual Character	low-medium
Scenic Quality	low-medium
View Composition	low-medium
Viewing Period	low-medium
Viewing Distance	low-medium
View Loss & View Blocking Effects	low
Overall rating of effects on baseline factors	**low-medium**
Rating of visual effects on variable weighting factors	
View Place Sensitivity	low-medium (up-weight)
Physical Absorption Capacity	medium (up-weight)
Compatibility with Future Landscape Character Direction	high (down-weight)
Overall rating of significance of visual impact	**low**

Figure 14 Viewpoint location.

Figure 15 Viewpoint 01 existing view.

Figure 16 Viewpoint 01 proposed view - photomontage.

VIEW 02
VIEW WEST FROM HAMILTON HIGHWAY

DISTANCE CLASS

- Medium
- 430m

EXISTING COMPOSITION OF THE VIEW

VP2 represents a potential view of short duration, experienced by a road user, from moving viewing situations.

VP2 is a view west from the eastern side of Hamilton Highway, approximately 430m east of the subject site. The existing view includes open, pastoral land which is largely devoid of vegetation and built forms characterised by vernacular rural features such as paddock fences and highly visible electrical transmission infrastructure in the foreground and mid-ground. Although not shown, the transmission lines and pylons approach and cross the highway to the west (left) of this image. The distant background includes low but semi-continuous vegetation which helps form a natural land-sky horizon.

VISUAL EFFECTS OF THE PROPOSED DEVELOPMENT ON THE COMPOSITION AS MODELLED

Views from VP2 will include part of the solar panel installation, which appears as a low, continuous narrow horizontal dark- coloured feature. The proposed development sits below the land-sky horizon and does not create a new built form horizon. In this regard and our opinion the simplistic form is compatible with the long, horizontal and expansive nature of the landscape (topography) in this view to an extent that the visual character and scenic quality of the view is not significantly blocked or negatively affected. The proposed development occupies only part of the wider view available (across the landscape in other directions) and does not block views to any unique, identified, documented views or to distinctive landscapes and predominantly blocks areas of an open vernacular pastoral landscape.

Visual effects of proposed development	
Visual Character	low
Scenic Quality	low
View Composition	low
Viewing Period	low
Viewing Distance	low
View Loss & View Blocking Effects	low
Overall rating of effects on baseline factors	**low**
Rating of visual effects on variable weighting factors	
View Place Sensitivity	low (down-weight)
Physical Absorption Capacity	high (down-weight)
Compatibility with Future Landscape Character Direction	high (down-weight)
Overall rating of significance of visual impact	**low (or less)**

Figure 17 Viewpoint location.

Figure 18 Viewpoint 02 existing view.

Figure 19 Viewpoint 02 proposed view - photomontage.

VIEW 03
VIEW NORTH-WEST FROM BOONERAH ESTATE ROAD

DISTANCE CLASS
- Medium
- 380m

EXISTING COMPOSITION OF THE VIEW

VP3 is a view north-west from the eastern side of Boonerah Estate Road, approximately 380m southeast of the subject site. The existing view is predominantly characterised by open, pastoral land which is largely devoid of vegetation and built forms with the exception of fences. The background composition includes a high voltage transmission line and pylons across a relatively flat, open landscape with shelter belts and a semi-continuous line of vegetation in the distance which in parts forms the land-sky horizon.

VISUAL EFFECTS OF THE PROPOSED DEVELOPMENT ON THE COMPOSITION AS MODELLED

The proposal introduces a new low horizontal feature into the mid-ground composition of the view, where the open foreground pastoral landscape is retained and is unaffected.

Views from VP3 will include part of the solar panel installation which appears as a low, continuous, narrow, horizontal dark-coloured feature in the distant mid-ground. The proposed development sits below the land-sky horizon and does not create a new built form horizon.

In this regard, and in our opinion, the simplistic form is compatible with the long, horizontal and expansive nature of the landscape (topography) in this view to an extent that the visual character and scenic quality of the view is not significantly blocked or negatively affected. The proposed development only occupies part of the wider view available (across the landscape and in other directions) and does not block views to any unique, identified, documented views to distinctive landscapes. The proposal blocks areas of an open vernacular pastoral landscape.

Visual effects of proposed development	
Visual Character	low
Scenic Quality	low
View Composition	low
Viewing Period	low
Viewing Distance	low
View Loss & View Blocking Effects	low
Overall rating of effects on baseline factors	**low**
Rating of visual effects on variable weighting factors	
View Place Sensitivity	low (down-weight)
Physical Absorption Capacity	high (down-weight)
Compatibility with Future Landscape Character Direction	high (down-weight)
Overall rating of significance of visual impact	**low (or less)**

Figure 20 Viewpoint location.

Figure 21 Viewpoint 03 existing view.

Figure 22 Viewpoint 03 proposed view - photomontage.

VIEW 04

VIEW WEST FROM ENTRANCE TO RESIDENCE ON HAMILTON HIGHWAY

DISTANCE CLASS

- Medium
- 380m

EXISTING COMPOSITION OF THE VIEW

VP4 represents an existing view from the entrance to a residence immediately east of Hamilton Highway, approximately 380m northwest of the subject site. The existing view includes open, undeveloped pastoral land which is largely devoid of vegetation. The background composition includes a high voltage transmission line and pylons across a relatively flat open landscape as well as power lines and poles in the distant middle ground.

VISUAL EFFECTS OF THE PROPOSED DEVELOPMENT ON THE COMPOSITION AS MODELLED

The proposal introduces a new low horizontal feature into the distant mid-ground composition of the view, where the open foreground pastoral landscape is retained and is unaffected.

Views from VP4 will include part of the solar panel installation which appears as a low, continuous, narrow, horizontal dark-coloured feature in the distant mid-ground. The proposed development sits below the land-sky horizon and does not create a new built form horizon.

In this regard, and in our opinion, the simplistic form is compatible with the long, horizontal and expansive nature of the landscape (topography) in this view to an extent that the visual character and scenic quality of the view is not significantly blocked or negatively affected. The proposed development only occupies part of the wider view available (across the landscape and in other directions) and does not block views to any unique, identified, documented views to distinctive landscapes. The proposal blocks areas of an open vernacular pastoral landscape.

Visual effects of proposed development	
Visual Character	low
Scenic Quality	low
View Composition	low
Viewing Period	low
Viewing Distance	low
View Loss & View Blocking Effects	low
Overall rating of effects on baseline factors	**low**
Rating of visual effects on variable weighting factors	
View Place Sensitivity	low (down-weight)
Physical Absorption Capacity	high (down-weight)
Compatibility with Future Landscape Character Direction	high (down-weight)
Overall rating of significance of visual impact	**low (or less)**

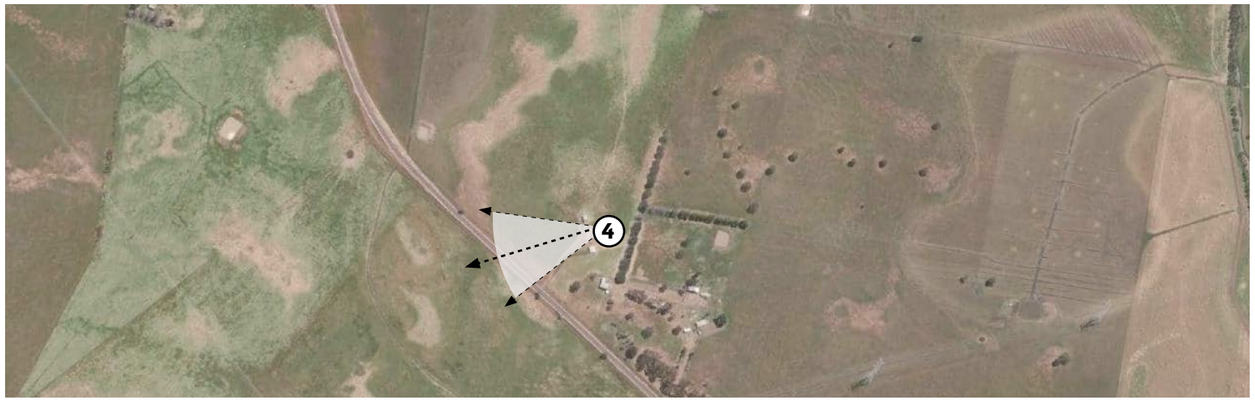


Figure 23 Viewpoint location.

Figure 24 Viewpoint 04 existing view.

Figure 25 Viewpoint 04 proposed view - photomontage.

VIEW 05

VIEW SOUTH-WEST FROM ENTRANCE TO RESIDENCE ON HAMILTON HIGHWAY

DISTANCE CLASS

- Medium
- 380m

EXISTING COMPOSITION OF THE VIEW

VP5 represents a potential view from the entrance to a residence immediately east of Hamilton Highway, approximately 380m northwest of the subject site. The existing view includes open, pastoral land which includes a linear shelter belt to the south (left) but is otherwise largely devoid of vegetation and visible built form, with the exception of a rural shed in the distance. The foreground includes low-scale electrical infrastructure whilst the distant background includes a high- voltage transmission power lines and pylons, across a flat open landscape as well as power lines and poles in the medium distance.

VISUAL EFFECTS OF THE PROPOSED DEVELOPMENT ON THE COMPOSITION AS MODELLED

The proposal introduces a new low horizontal feature into the mid-ground composition of the view. This is a close view where the entire extent of the midground includes solar panels which are highly visible. The open foreground pastoral landscape is retained and is unaffected.

In views from this location solar panels appears as a low, continuous, narrow, horizontal dark-coloured feature in the mid-ground. The proposed development sits below the land-sky horizon and does not create a new built form horizon.

In this regard, and in our opinion, the simplistic form is compatible with the long, horizontal and expansive nature of the landscape (topography) in this view to an extent that the visual character and scenic quality of the view is not significantly blocked or negatively affected. The proposed development only occupies part of the wider view available (across the landscape and in other directions) and does not block views to any unique, identified, documented views to distinctive landscapes. The proposal blocks areas of an open vernacular pastoral landscape.

Visual effects of proposed development	
Visual Character	low-medium
Scenic Quality	low-medium
View Composition	low-medium
Viewing Period	low
Viewing Distance	low
View Loss & View Blocking Effects	low
Overall rating of effects on baseline factors	**low-medium**
Rating of visual effects on variable weighting factors	
View Place Sensitivity	high (up-weight)
Physical Absorption Capacity	low (up-weight)
Compatibility with Future Landscape Character Direction	high (down-weight)
Overall rating of significance of visual impact	**low**

Figure 26 Viewpoint location.

Figure 27 Viewpoint 05 existing view.

Figure 28 Viewpoint 05 proposed view - photomontage.

VIEW 06

VIEW NORTH-EAST FROM RESIDENCE ON BOONERAH ESTATE ROAD

DISTANCE CLASS

- Medium
- 380m

EXISTING COMPOSITION OF THE VIEW

VP6 represents a view from a residence on Boonerah Estate Road, approximately 380m southwest of the subject site. The existing view includes open, undeveloped pastoral land which is largely devoid of vegetation, having been extensively cleared for agricultural purposes. The existing view features fencing in the close distance, a tree line in the middle distance, occupying part of the view available. The background composition includes a high voltage transmission line and pylons across a relatively flat, open landscape.

VISUAL EFFECTS OF THE PROPOSED DEVELOPMENT ON THE COMPOSITION AS MODELLED

The proposal introduces a new low horizontal feature into the distant mid-ground composition where the open foreground pastoral landscape is retained and is unaffected.

Views from VP6 will include part of the solar panel installation which appears as a low, continuous, narrow, horizontal dark-coloured feature in the distant mid-ground. The proposed development sits below the land-sky horizon and does not create a new built form horizon.

In this regard, and in our opinion, the simplistic form is compatible with the long, horizontal and expansive nature of the landscape (topography) in this view to an extent that the visual character and scenic quality of the view is not significantly blocked or negatively affected. The proposed development only occupies part of the wider view available (across the landscape and in other directions) and does not block views to any unique, identified, documented views to distinctive landscapes. The proposal blocks areas of an open vernacular pastoral landscape. documented views to distinctive landscapes.

Visual effects of proposed development	
Visual Character	low
Scenic Quality	low
View Composition	low
Viewing Period	high
Viewing Distance	low
View Loss & View Blocking Effects	low
Overall rating of effects on baseline factors	**low**
Rating of visual effects on variable weighting factors	
View Place Sensitivity	low (down-weight
Physical Absorption Capacity	high (down-weight)
Compatibility with Future Landscape Character Direction	high (down-weight)
Overall rating of significance of visual impact	**low (or less)**

Figure 29 Viewpoint location.

Figure 30 Viewpoint 06 existing view.

Figure 31 Viewpoint 06 proposed view - photomontage.

06 AMELIORATION STRATEGIES

6.1 AMELIORATION SCENARIOS

Amelioration strategies are typically used to mitigate the visual impact of a proposal of this nature. **On-site actions** are undertaken within the boundaries of the site area for the project.

Off-site actions are the mitigation strategies undertaken outside of the project area boundary and require the consent of relevant landowners and authorities. Assessment of proposed on-site amelioration finds that the necessary level of mitigative screening can be achieved within the site area and that no off-site actions are required. The amelioration strategies for the proposal are on-site only, described below.

6.2 PERIMETER PLANTING

The most effective way to ameliorate views from high sensitivity viewpoints is to establish screen planting around the perimeter of the project boundary where there is a lack of existing vegetation.

Given the irregular shape of the site, there are multiple exposed boundaries. It is therefore proposed to screen the perimeters of all areas occupied by solar panels.

Landscape buffers are proposed along the boundaries of parcel A and the southern and eastern boundaries of parcel B and C which face publicly accessible roads. Buffers are inset from the western boundary for parcels B and C, and are confined to the areas occupied by the panels.

Parcel A

The perimeter of Parcel A is screened by Landscape Buffer Type 3 which includes low density tree and shrub planting. Type 3 includes various tree species that grow up to 10m in height and 5m in width as well as large, medium and small mature shrubs that provide additional density and screening. Type 3 provides the necessary screening to mitigate visual impacts from VP1 and VP3.

Type 3 will also screen part of the southern boundary and the western edge of parcels B and C.

Parcels B & C

Type 3 will also provide screening along the western section of the southern boundary, and the western edge of parcels B and C. The remainder of the southern boundary will be screened by Landscape buffer Type 1 (high density tree and shrub planting) to provide screening from VP6 (residence on Boonerah Estate Road) and Type 2 (high density shrub planting).

Type 2 will also extend along the majority of the eastern frontage of the site along Hamilton Road screening VP2, VP4 and VP5. The northern part of the eastern boundary will be screened with Type 1 where there is a gap in existing roadside vegetation.

Type 1 includes trees that grow up to 30m in height and 15m in width and mature large and medium sized shrubs. Type 2 includes mature large, medium and small shrubs where the largest species grow up to 10m in height and 5m in width.

Refer to the Landscape Strategy prepared by Urbis for further details regarding planting typologies.

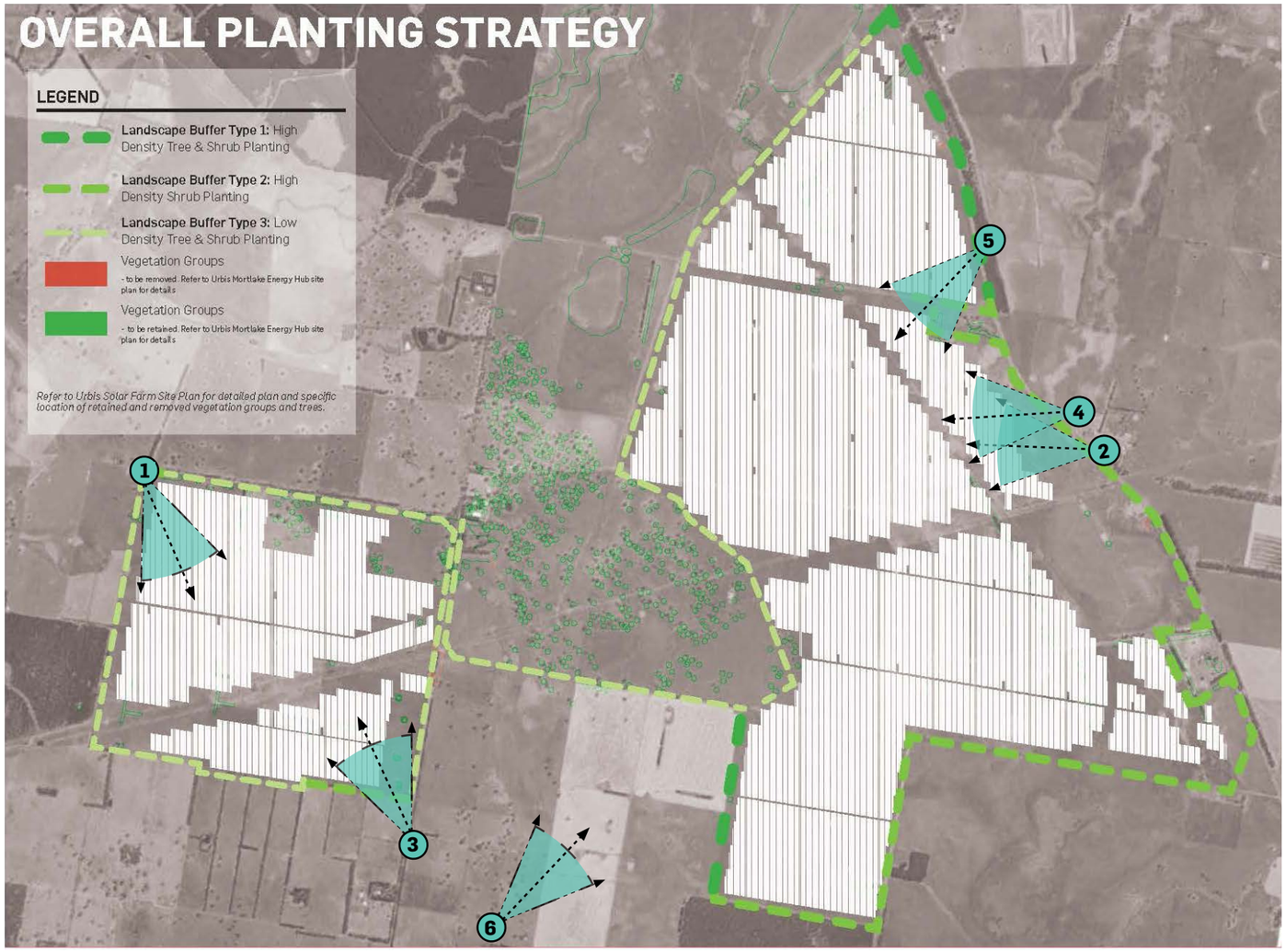


Figure 32 Landscape Planting Strategy | Urbis - View locations indicated in teal.

Figure 33 Viewpoint 01 - Proposed mitigative planting at 5 years - photomontage.

Figure 34 Viewpoint 02 - Proposed mitigative planting at 5 years - photomontage.

Figure 35 Viewpoint 03 - Proposed mitigative planting at 5 years - photomontage.

Figure 36 Viewpoint 04 - Proposed mitigative planting at 5 years - photomontage.

Figure 37 Viewpoint 05 - Proposed mitigative planting at 5 years - photomontage.

Figure 38 Viewpoint 06 - Proposed mitigative planting at 5 years - photomontage.

07 VISUAL IMPACT ASSESSMENT

Having determined the extent of the visual change based on the 6 representative modelled views (photomontages) Urbis have applied relevant weighting factors to determine the overall level of visual impacts or importance of the visual effects. The factors have been considered in relation to the visual effects to provide up-weight or down-weights and to determine a final impact rating.

The weighting factors include sensitivity, visual absorption capacity and compatibility with landscape features.

7.1 SENSITIVITY

View place sensitivity was rated as low or low-medium in 5 of the 6 views modelled, where visibility to the site is experienced for limited periods of time from moving viewing situations. 1 view modelled from a close residential receiver was found to generate high visual effects in views from the driveway entrance to the property. Notwithstanding the visibility of the proposal from this location, and the high visual effects that will be experienced in the short term, the overall visual impact was found to be low, in considering the impact of on-site amelioration and long term residual effects.

7.2 PHYSICAL ABSORPTION CAPACITY

The existing visual environment and landscape setting generally has a high capacity to physically and visually absorb the proposal. Opportunities to overlook the project, in this flat landscape are limited. The landscape character of the Western Volcanic Plain will remain fundamentally unchanged by the proposal.

The proposed BESS facility (2.7km south-west of the main site) is located within a densely vegetated area that provides heavy screening around the facility. The BESS facility is sited north of the access road associated with the existing substation (south side of access road). The road is not publicly accessible and there are limited viewing opportunities to the area reserved for the BESS facility.

7.3 VISUAL COMPATIBILITY

The proposal remains compatible with the Future Landscape Character Directions and Landscape Protection and Management Objectives and Guidelines for the Western Volcanic Plain. The constrained height of the proposal, and its location within a predominantly flat area ensures views to identified features, viewing locations and road corridors remain unaffected. The proposed perimeter planting is visually consistent with the roadside and boundary plantings which form part of the existing visual character within the Western Volcanic Plain.

The proposal is compatible with the desired design responses outlined in the Landscape Management Guidelines.

7.4 SIGNIFICANCE OF RESIDUAL VISUAL IMPACTS

The final question to be answered after the mitigation factors are assessed, is whether there are any residual visual impacts and whether they are acceptable in the circumstances. These residual impacts are predominantly related to the extent of permanent visual change to the immediate setting.

Residual impacts relate to individuals' preferences for the nature and extent of change which cannot be mitigated by means such as colours, materials and the articulation of building surfaces. These personal preferences are to, or resilience towards change to the existing arrangement of views. Individuals or groups may express strong preferences for either the existing, approved or proposed form of development.

In our opinion, residual impacts are low and acceptable given the PAC of the surrounding landscape character, and the visual compatibility of the proposed perimeter planting with the existing roadside and boundary planting in this part of the Western Volcanic Plain. The proposal does not create any significant adverse effects on the wider landscape character of this part of South-western Victoria.

7.5 APPLYING ADDITIONAL WEIGHTING FACTORS

To arrive at a final level of significance of visual impact, the weighting factors are applied to the overall level of visual effects. Where the level of visual effects were rated as low for the majority of factors, for example scenic quality, character or sensitivity, and high for compatibility and physical absorption capacity these factors combine to provide a down-weight and a reduction to the overall final impact ratings. In all views modelled where the level of visual effects was rated as low for the majority of baseline factors, for example in relation to effects on scenic quality, character or composition, the overall visual rating was also low.

7.6 OVERALL VISUAL IMPACTS

Taking into consideration the existing visual context and baseline factors against which to measure change, the level of visual effects of the proposed development and in the context of additional weighting factors, including the effects of on-site amelioration and managing the anticipated future development of energy infrastructure in South-western Victoria, the visual impacts of the proposed development were found to be acceptable.

VIEW REFERENCE	LOCATION	RATING OF VISUAL EFFECTS ON VARIABLE WEIGHTING FACTORS AS LOW, MEDIUM OR HIGH			OVERALL RATING OF SIGNIFICANCE OF VISUAL IMPACT
		View Place Sensitivity	Physical Absorption Capacity	Compatibility with Visual Context and Future Landscape Character Direction	
VP1	View south-east from Hardys Lane	low-medium (up-weight)	medium (up-weight)	high (down-weight)	low-medium
VP2	View west from Hamilton Highway	low (down-weight)	high (down-weight)	high (down-weight)	low (or less)
VP3	View north-west from Boonerah Estate Road	low (down-weight)	high (down-weight)	high (down-weight)	low (or less)
VP4	View west from entrance to residence on Hamilton Highway	low (down-weight)	high (down-weight)	high (down-weight)	low (or less)
VP5	View south-west from entrance to residence on Hamilton Highway	high (up-weight)	low (up-weight)	high (down-weight)	low-medium
VP6	View north-east from residence on Boonerah Estate Road	low (down-weight)	high (down-weight)	high (down-weight)	low (or less)

Table 1 Summary of ratings of visual effects on weighting factors.

08 LIGHTING IMPACTS

8.1 LIGHTING IMPACT SCENARIOS

Australian Standard AS-NZ_4282-2019 Control of the Obtrusive Effects of Outdoor Lighting provides for the assessment of lighting impacts. The standard identifies 4 environmental zones for exterior lighting which are categorised according to the degree of artificial lighting within an area. For example, National Parks would be classed as an intrinsically dark landscape (Category A1), compared with a highly activated urbanised city centre with high levels of night-time activity would be considered a high district brightness area (Category A4).

The standard seeks to minimise light spill. Regardless of the existing level of artificial light in a given setting, light spill and particularly upward light spill, should be limited wherever possible.

Glow - Light glow is typically an upward projection of light that illuminates the night sky above the lighting source. It is more visually apparent in fog or cloud as the light reflects water droplets in the atmosphere, and can be visible over large areas.

Spill - Light spill is that which falls on nearby sensitive areas, both vertical and horizontal and is typically considered intrusive when it illuminates private open space or through windows.

Hot Spots - Hot Spots are concentrated areas of bright light in an otherwise dark or less bright setting and are typically visually prominent when elevated.

Kinetic - Lighting that changes colour or flashes to draw the attention of a viewer. The tempo at which the light changes, increases or decreases its visual prominence and ability to draw the viewer's attention.

AS-NZS-4282-2019 CONTROL OF OBTRUSIVE EFFECTS OF OUTDOOR LIGHTING ENVIRONMENTAL ZONES	
ENVIRONMENTAL ZONE	**DESCRIPTION**
A0	Intrinsically Dark e.g. Major Optiocal Observatories. No road lighting.
A1	Dark e.g. Relatively uninhabited rural areas. No road lighting.
A2	Low district brightness e.g. sparsely inhabited rural and semi-rural areas.
A3	Medium district brightness e.g. suburban areas in towns and cities.
A4	High district brightness e.g. town and city centres, commercial areas and residential areas abutting commercial areas.

Table 2 AS-NZS 4282-2019 Environmental Zones.

8.2 IMPACTS OF THE PROPOSAL

Environmental Zone A2 applies to the site and surrounds. The proposal does not generate an increased lighting impact given there is no requirement for operational lighting. Lighting impacts are therefore considered low.

Photo 3. Example of linear plantings along paddock boundaries.

Photo 4. Typical views across flat open plains.

09 GLINT & GLARE ASSESSMENT

9.1 DEFINITIONS, IMPACTS & GUIDELINES

For this glare assessment, we have referred to DELWP's Solar Energy Facilities: Design and Development Guideline (October 2022).

Additionally, there are no guidelines set by the Australian Government's Civil Aviation Safety Authority (CASA) to assess glint and glare, therefore guidelines issued by the United States Federal Aviation Administration (FAA) will be used.

According to the FAA's Technical Guidance for Evaluating Selected Solar Technologies on Airports (v1.1 April 2018), the following definitions for reflectivity, glint and glare are as follows:

Reflectivity: Light that is reflected off surfaces
Glint: A momentary flash of bright light, reflected off a surface.
Glare: A continuous source of bright light, reflected off a surface.

The degree of potential ocular impacts are calculated based on retinal irradiance and subtended angle (size) of the glare source and based on the results, the potential ocular impacts can fall into one of three categories, being:

- Green - low potential to cause after-image (flash blindness)
- Yellow - potential to cause temporary after-image
- Red - potential to cause retinal burn (permanent eye damage)

These coloured ranges are widely accepted and were adopted by the FAA as part of their 'Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports' (Oct 2013). Refer to **Figure 41**. The policy also required that any proposed solar energy system must meet the following standards:

1. No potential for glint or glare in the existing or planned ATCT
2. No potential for glare or "low potential for after-image" green in Figure 1) along the final approach path for any existing landing threshold or future landing thresholds. The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.

Under the FAA's recently revised final policy (May 2021), only airports with Airport Traffic Control Towers (ATCTs) are now required to have glint and glare assessments, with the focus on potential impacts towards the ATCTs. The final policy no longer states requirements relating to final approach paths, stating that:

'Initially, FAA believed that solar energy systems could introduce a novel glint and glare effect to pilots on final approach. FAA has subsequently concluded that in most cases, the glint and glare from solar energy systems to pilots on final approach is similar to glint and glare pilots routinely experience from water bodies, glass facade buildings, parking lots, and similar features.'

Additionally, there are a number of airports around the world that have installed solar projects to support their operations, including the recently constructed and operational Melbourne Airport solar farm located about 1km north from its north-south runway, with an additional solar farm located about 700m from the north-south runway proposed to be operational by end of 2024.

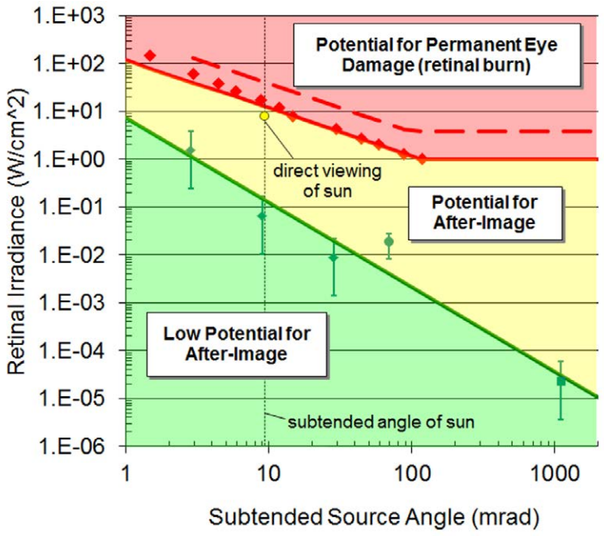


Figure 39 Glare hazard plot defining ocular impact (Ho et al, 2011)

9.2 PV ARRAY AREAS

The Project footprint has been broken down into ten proposed PV array areas, representing the area proposed to contain solar panels based on the proposed layout. Coordinates for these have been derived from the supplied CAD layout plans which contain geo-coordinates. Refer to **Table 3** and **Figure 41.**

PV Areas ID	PV Areas details
PV Array A	off Hamilton Hwy (west)
PV Array B	off Hamilton Hwy/Boonerah Estate Rd (north-west)
PV Array C	off Boonerah Estate Rd (north)
PV Array D	off Boonerah Estate Rd (south)
PV Array E	off Hamilton Hwy/Boonerah Estate Rd (south-west)
PV Array F	off Thulborns Lne (north)
PV Array G	off Hamilton Hwy (south-west)
PV Array H	off Thulborns Lne/Booths Lne (south-west)
PV Array I	off Hardys Lne (south)
PV Array J	off Boonerah Estate Rd (west)

Table 3 Project PV Areas.

9.3 RECEPTORS

As recommended in DELWP's Solar Energy Facilities: Design and Development Guideline (October 2022), roads and dwellings within 1km of the proposed facility boundaries will be assessed. Additionally, dwellings sitting just outside of this 1km zone will also be assessed. These additional receptors are identified by Receptor IDs OP13, OP14 and OP15. Refer to **Table 4** and **Figure 42.**

There are no nearby aviation facilities identified.

A total of 24 receptors have been identified and will be assessed. Refer to **Table 4** and **Figure 42.**

Receptor ID	Receptor Type	Receptor details	Distance to Project
OP 1	dwelling	409 Boonerah Estate Road, Mortlake 3272	0m
OP 2	dwelling	35 Thulborns Lane, Mortlake 3272	40m
OP 3	dwelling	593 Hamilton Highway, Mortlake 3272	40m
OP 4	dwelling	Lot 1 LP76419 / Hardys Lane, Mortlake 3272	75m
OP 5	dwelling	300 Boonerah Estate Road, Mortlake 3272	100m
OP 6	dwelling	Lot 2 PP636473 / Hamilton Highway, Mortlake 3272	170m
OP 7	dwelling	490 Hamilton Highway, Mortlake 3272	180m
OP 8	dwelling	766 Hamilton Highway, Hexham 3273	270m
OP 9	dwelling	640 Boonerah Estate Road, Mortlake 3272	540m
OP 10	dwelling	73 Kings Lane, Mortlake 3272	390m
OP 11	dwelling	122 Kings Lane, Mortlake 3272	840m
OP 12	dwelling	69 Holdsworths Lane, Mortlake 3272	900m
OP 13	dwelling	570 Connewarren Lane, Mortlake 3272	1.10km
OP 14	dwelling	349 Connewarren Lane, Mortlake 3272	1.13km
OP 15	dwelling	409 Connewarren Lane, Mortlake 3272	1.15km
Route 1	road	Hamilton Hwy	10m
Route 2	road	Boonerah Estate Rd	<10m
Route 3	road	Hardys Lane	<10m
Route 4	road	Thulborns Lane	<10m
Route 5	road	Booths Lane	<10m
Route 6	road	Kings Lane	310m
Route 7	road	Arnotts Lane	190m
Route 8	road	Racecourse Lane	440m
Route 9	road	Castle Carey Rd	930m

Table 4 Project receptors and routes

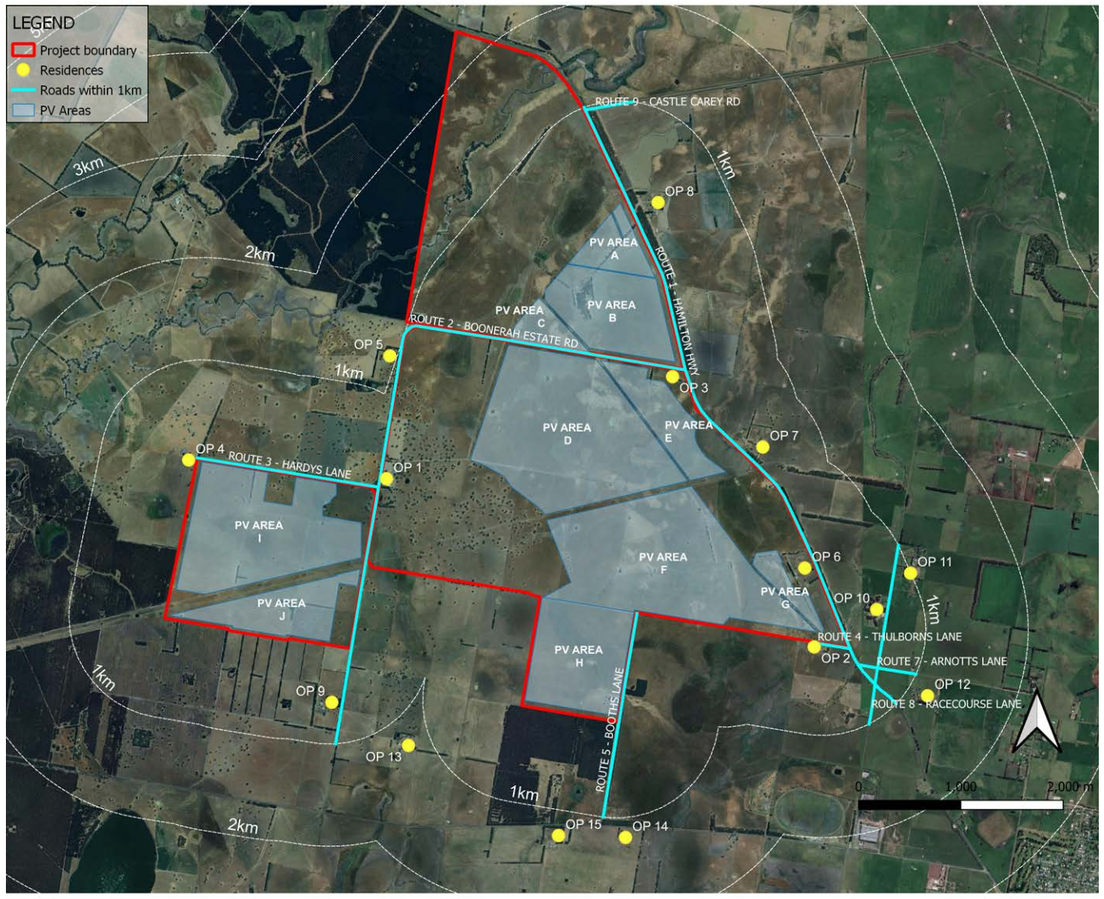


Figure 40 Project receptors and routes.

9.4 GLARE MODELLING

Glare in this report has been assessed using ForgeSolar's GlareGauge software, which is widely used to predict glare and is based on the Solar Glare Hazard Tool (SGHAT) developed by Sandia National Laboratories in conjunction with the FAA.

The parameters used as inputs for the modelling are set out in **Table 5.**

Parameter	Value	Units	Comment
Site Settings			
Timezone offset	+10	UTC	Australian Eastern Standard Time (AEST)
Time interval	1	minute	Default (unchanged) Modelling interval
Peak DNI	1000	W/m²	Default (unchanged) The maximum Direct Normal Irradiance at the given location at solar noon.
DNI Varies?	yes	-	Default (unchanged) DNI will be scaled based on sun position
Advanced			
Sun Angle	9.3	mrad	Default (unchanged)
Ocular transmission coefficient	0.5	-	Default (unchanged)
Pupil diameter	0.002	m	Default (unchanged)
Eye focal length	0.017	m	Default (unchanged)
PV Arrays			
Panel Configuration & Tracking			
Tracking	Single-axis	type	Proposed system will track from east to west
Backtracking method	Shade-slope	type	Proposed system supports backtracking
Tracking axis orientation	0	deg	Azimuthal position of tracking axis points north
Maximum tracking angle	+/-60°	deg	East/West rotation limit of panels. Total 120°
Resting angle	various	deg	Various scenarios tested (0°,5°,10°,12°,15°,30°,45°,60°)
Ground Coverage Ratio (GCR)	0.329	-	Ratio between panel area and ground area
Material & Power			
Module surface material	Smooth glass with ARC	type	Proposed panels are smooth glass with anti-reflective coating as specified in supplied manufacturers specification sheet. (Canadian Solar - CS7N-660MB-AG)
Reflectivity varies with incidence angle	yes	-	Default (unchanged)
Correlate slope error with module surface type	yes	-	Default (unchanged)
Rated power (optional)	0	kW	Optional - Not used
Receptors			
View angle	50°	deg	Default (unchanged)
PV Array height	1.632	m	Height of PV array above ground (at panel centroid), determined by panel dimensions at maximum 60° tilt whilst retaining a minimum ground clearance of 600mm.
Standing height at Observation Points (OPs)	1.6	m	Height of person standing above natural ground level at observation points (OPs)
Driver height (road)	2.4	m	eye height of truck driver above road
Glide slope (flight-path approach)	3	deg	Default (unchanged)

Table 5 Modelling input parameters.

To more accurately define the Project's ten PV areas within the model, coordinates that define PV Arrays A-J have been extracted from geo-referenced digital CAD files and imported into the model.

Elevations for all points have also been determined using primarily survey levels or secondary sources such as local datasets with all levels entered as AHD levels, overriding the modelling software's built-in elevations, which would otherwise be obtained through Google Maps. All elevations for road routes, dwellings and airports (where applicable) have also been prepared in the same way.

9.5 ASSUMPTIONS & LIMITATIONS

GlareGauge has some of the following limitations:

- The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results.
- The analysis does not consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
- The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
- The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modelling methods.

9.6 RESTING ANGLES

In order to better understand and reduce the amount of any predicted glare from the Project towards all identified receptors, a number of scenarios across the solar panel tilt range will be analysed. We have found that for projects where glare has been predicted that a key factor affecting the level of predicted Project glare could often be contributed to the configured resting angle of the proposed system.

The resting angle is defined as the angle of rotation of panels when the sun is outside its tracking range and backtracking rotation has settled. If by analysing the project over a number of resting angle scenarios find that there is a significant change in magnitude of predicted glare that it often indicates that a significant portion of glare predicted are not due to times of the day when the sun is within the tracking range (-60° to +60°) but at times when the sun is outside of the tracking range when the panels have returned to its predefined resting angle. The resting angle for solar panels is configurable, typically set to around 45-60 degrees.

9.7 RESULTS

A total of eight scenarios based on resting angle were simulated covering the full range of motion from 0° to +/-60° to understand the effect of altering the resting angle parameter on predicted glare. For scenarios with resting angle configured at 0°-10° some green and yellow glare is predicted from some of the PV Arrays, namely PV Arrays C-J, with no predicted glare for PV Arrays A and B. The amount of glare predicted decreases as the resting angle is increased, with the modelling showing that scenarios ranging from a resting angle of 12°-60° resulted in no predicted glare to any receptors from all ten PV Arrays. See **Table 6.**

	PV Array A		PV Array B		PV Array C		PV Array D		PV Array E	
	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)
Resting Angle	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**
0 degrees	0	0	0	0	297	0	426	2668	1,244	861
5 degrees	0	0	0	0	0	0	207	541	0	0
10 degrees	0	0	0	0	0	0	166	170	0	0
12 degrees	0	0	0	0	0	0	0	0	0	0
15 degrees	0	0	0	0	0	0	0	0	0	0
30 degrees	0	0	0	0	0	0	0	0	0	0
45 degrees	0	0	0	0	0	0	0	0	0	0
60 degrees	0	0	0	0	0	0	0	0	0	0

	PV Array F		PV Array G		PV Array H		PV Array I		PV Array J	
	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)
Resting Angle	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**	**Total (all receptors)**
0 degrees	0	0	960	1459	256	407	2,040	5040	724	265
5 degrees	0	0	0	0	8	531	174	1049	51	255
10 degrees	0	0	0	0	0	0	0	0	0	0
12 degrees	0	0	0	0	0	0	0	0	0	0
15 degrees	0	0	0	0	0	0	0	0	0	0
30 degrees	0	0	0	0	0	0	0	0	0	0
45 degrees	0	0	0	0	0	0	0	0	0	0
60 degrees	0	0	0	0	0	0	0	0	0	0

Table 6 Summary results: Total predicted glare based on resting angle.

Summary of Results Resting Angles 12°-60°

Under all scenarios where the Project is configured with a resting angle from 12°-60° there is no glare predicted towards all identified receptors. See **Table 7** for detailed results, the report outputs from the ForgeSolar's GlareGauge software is provided as **Appendix 4.**

			Green Glare (min/year)	Yellow Glare (min/year)
Receptor ID	**Receptor Type**	**Receptor details**	**PV Arrays A-J (ALL)**	
OP 1	dwelling	409 Boonerah Estate Road, Mortlake 3272	0	0
OP 2	dwelling	35 Thulborns Lane, Mortlake 3272	0	0
OP 3	dwelling	593 Hamilton Highway, Mortlake 3272	0	0
OP 4	dwelling	Lot 1 LP76419 / Hardys Lane, Mortlake 3272	0	0
OP 5	dwelling	300 Boonerah Estate Road, Mortlake 3272	0	0
OP 6	dwelling	Lot 2 PP636473 / Hamilton Highway, Mortlake 3272	0	0
OP 7	dwelling	490 Hamilton Highway, Mortlake 3272	0	0
OP 8	dwelling	766 Hamilton Highway, Hexham 3273	0	0
OP 9	dwelling	640 Boonerah Estate Road, Mortlake 3272	0	0
OP 10	dwelling	73 Kings Lane, Mortlake 3272	0	0
OP 11	dwelling	122 Kings Lane, Mortlake 3272	0	0
OP 12	dwelling	69 Holdsworths Lane, Mortlake 3272	0	0
OP 13	dwelling	570 Connewarren Lane, Mortlake 3272	0	0
OP 14	dwelling	349 Connewarren Lane, Mortlake 3272	0	0
OP 15	dwelling	409 Connewarren Lane, Mortlake 3272	0	0
Route 1	road	Hamilton Hwy	0	0
Route 2	road	Boonerah Estate Rd	0	0
Route 3	road	Hardys Lane	0	0
Route 4	road	Thulborns Lane	0	0
Route 5	road	Booths Lane	0	0
Route 6	road	Kings Lane	0	0
Route 7	road	Arnotts Lane	0	0
Route 8	road	Racecourse Lane	0	0
Route 9	road	Castle Carey Rd	0	0

Table 7 Summary of results: Total predicted glare (resting angles 12°-60°).

9.7 RECOMMENDATIONS

We therefore recommend that the Resting Angle for the Project is configured to between 12° and 60° (inclusive) to eliminate all potential glare towards assessed receptors. This range falls within the typical resting angle range for solar farms of around 45-60 degrees.

Based on the proposed layout there are no glare impacts expected for the Project for all assessed receptors within 1km of the Project, which includes assessed roads and dwellings. As a result, there would also be no interference expected for viewpoints located at greater distances from the project site.

As there is no glare predicted when the proposed solar panels for the Project are configured within the recommended and typical resting angle ranges, additional glare mitigation measures are not required.

Other studies which have assessed the potential glare and glint impact of a similar solar panel configuration (single axis tracking), concluded that for the single axis tracking system, there was no predicted glare. This is a result of the tilting panels typically tracking the sun, ensuring the panel surfaces remain mostly perpendicular to the angle of the sun. Therefore, glare or glint impacts on surrounding areas is unlikely.

10 CONCLUSION

- The modelled views show that the proposal appears as a low-height continuous horizontal, form which is highly compatible with the flat open plains of the Western Volcanic Plain. In all views modelled the proposal sits below the line of the horizon and does not significantly contrast with the topography of the surrounding landscape.
- Based on photomontages, the views modelled indicate the proposal creates **low** levels of visual effects in close surrounding views from within the visual catchment.
- In all views modelled where the level of visual effects was rated as low for the majority of baseline factors, for example in relation to effects on scenic quality, character or composition, the overall visual rating was also **low.**
- The visual effects assessed are those created by the proposal without mitigative planting, which show a 'worst-case scenario'. The visual effects of vegetative screening will further reduce visibility to the proposal over time.
- There will be visibility to the proposal from major public roads (Hamilton Highway) in the short term, however, visibility to the site is experienced for limited periods of time from moving viewing situations. Long term, on-site amelioration will screen views to the proposal from surrounding roadways.
- The proposed BESS facility does not have any exposed boundaries and will remain screened by nearby dense vegetation. There are limited viewing opportunities to the BESS facility given there is no public access to the site.
- Visual impacts associated with lighting were found to be low (or less).
- The proposed vegetative screening is visually consistent with established plantings in this part of the Western Volcanic Plain and the overall long term residual visual impacts are considered **low.**
- The proposal is consistent with the management guidelines of the Western Volcanic Plain in the context of anticipated future renewable energy projects.

Recommendations

Based on the glint and glare assessment contained in section 9.0 of this report, we recommend that the Resting Angle for the Project is configured to between 12° and 60° (inclusive) to eliminate all potential glare towards assessed receptors.

Based on the proposed layout and the recommended resting angles, we anticipate no glare impacts for the Project for all assessed receptors within 1km.

As there is no glare predicted when the proposed solar panels for the Project are configured within the recommended and typical resting angle ranges, additional glare mitigation measures are not required.

11 APPENDIX

APPENDIX 1
ANALYSIS OF VISUAL EFFECTS

Published on the NSW Department of Planning, Industry and Environment website via major projects tab (NSW DPIE). This information has been developed by RLA and is acknowledged as being a comprehensive summary of typical descriptions regarding visual effects. The descriptions below have been used as a guide to make subjective judgements in relation to the effects and impacts of the proposed development on each modelled view.

Factors	Low Effect	Medium Effect	High Effect
Scenic quality	The proposal does not have negative effects on features which are associated with high scenic quality, such as the quality of panoramic views, proportion of or dominance of structures, and the appearance of interfaces.	The proposal has the effect of reducing some or all of the extent of panoramic views, without significantly decreasing their presence in the view or the contribution that the combination of these features make to overall scenic quality	The proposal significantly decreases or eliminates the perception of the integrity of any of panoramic views or important focal views. The result is a significant decrease in perception of the contribution that the combinations of these features make to scenic quality
Visual character	The proposal does not decrease the presence of or conflict with the existing visual character elements such as the built form, building scale and urban fabric	The proposal contrasts with or changes the relationship between existing visual character elements in some individual views by adding new or distinctive features but does not affect the overall visual character of the precinct's setting.	The proposal introduces new or contrasting features which conflict with, reduce or eliminate existing visual character features. The proposal causes a loss of or unacceptable change to the overall visual character of individual items or the locality.
View place sensitivity	Public domain viewing places providing distant views, and/or with small number of users for small periods of viewing time (Glimpses-as explained in viewing period).	Medium distance range views from roads and public domain areas with medium number of viewers for a medium time (a few minutes or up to half day-as explained in viewing period).	Close distance range views from nearby roads and public domain areas with medium to high numbers of users for most the day (as explained in viewing period).
Viewer sensitivity	Residences providing distant views (>1000m).	Residences located at medium range from site (100-1000m) with views of the development available from bedrooms and utility areas.	Residences located at close or middle distance (<100m as explained in viewing distance) with views of the development available from living spaces and private open spaces.
View composition	Panoramic views unaffected, overall view composition retained, or existing views restricted in visibility of the proposal by the screening or blocking effect of structures or buildings.	Expansive or restricted views where the restrictions created by new work do not significantly reduce the visibility of the proposal or important features of the existing visual environment.	Feature or focal views significantly and detrimentally changed.
Viewing period	Glimpse (e.g. moving vehicles).	Few minutes to up to half day (e.g. walking along the road, recreation in adjoining open space).	Majority of the day (e.g. adjoining residence or workplace).
Viewing distance	Distant Views (>1000m).	Medium Range Views (100- 1000m).	Close Views (<100m).
View loss or blocking effect	No view loss or blocking.	Partial or marginal view loss compared to the expanse/extent of views retained. No loss of views of scenic icons.	Loss of majority of available views including loss of views of scenic icons.

APPENDIX 2
ANALYSIS OF VISUAL IMPACTS

In order to establish an objective assessment of the extent and significance of the likely visual changes in each view, Urbis have used the following descriptions of visual impacts on baseline factors sourced from Richard Lamb and Associates (RLA).

Factors	Low Impact	Medium Impact	High Impact
Physical absorption capacity	Existing elements of the landscape physically hide, screen or disguise the proposal. The presence of buildings and associated structures in the existing landscape context reduce visibility. Low contrast and high blending within the existing elements of the surrounding setting and built form.	The proposal is of moderate visibility but is not prominent because its components, texture, scale and building form partially blend into the existing scene.	The proposal is of high visibility and it is prominent in some views. The project location is high contrast and low blending within the existing elements of the surrounding setting and built form.
Compatibility with urban/natural features	High compatibility with the character, scale, form, colours, materials and spatial arrangement of the existing urban and natural features in the immediate context. Low contrast with existing elements of the built environment.	Moderate compatibility with the character, scale, form and spatial arrangement of the existing urban and natural features in the immediate context. The proposal introduces new urban features, but these features are compatible with the scenic character and qualities of facilities in similar settings.	The character, scale, form and spatial arrangement of the proposal has low compatibility with the existing urban features in the immediate context which could reasonably be expected to be new additions to it when compared to other examples in similar settings.

APPENDIX 3
PHOTOMONTAGES

URBIS

MORTLAKE ENERGY HUB

VISUAL ASSESSMENT | PHOTOMONTAGES

PREPARED FOR
BRIGHTNIGHT POWER
APRIL 2024

PHOTOMONTAGES PREPARED BY:

Urbis, Level 10, 477 Collins Street, MELBOURNE 3000.

DATE PREPARED :

26 April 2024

VISUALISATION ARTIST :

Ashley Poon, Urbis – Lead Visual Technologies Consultant
Bachelor of Planning and Design (Architecture) with over 20 years' experience in 3D visualisation

Enisa Muranovic, Urbis – Visual Technologies Consultant
Bachelor of Design (Landscape Architecture)

Manuel Alvelo, Urbis – Design Assistant
Bachelor of Architecture and student in Masters of Urban Planning and Environment

LOCATION PHOTOGRAPHER :

Enisa Muranovic, Urbis – Visual Technologies Consultant, Bachelor of Design (Landscape Architecture) under direction from Jane Maze-Riley, Urbis - Director, National Design

CAMERA :

Canon EOS 6D Mark II - 26 Megapixel digital SLR camera (Full-frame sensor)

CAMERA LENS AND TYPE :

Canon EF 24-105mm f/4L IS USM

SOFTWARE USED :

- 3DSMax 2023 with Arnold 5.0 (3D Modelling and Render Engine)
- AutoCAD 2022 (2D CAD Editing)
- Globalmapper 24 (GIS Data Mapping / Processing)
- Photoshop CC 2022 (Photo Editing)

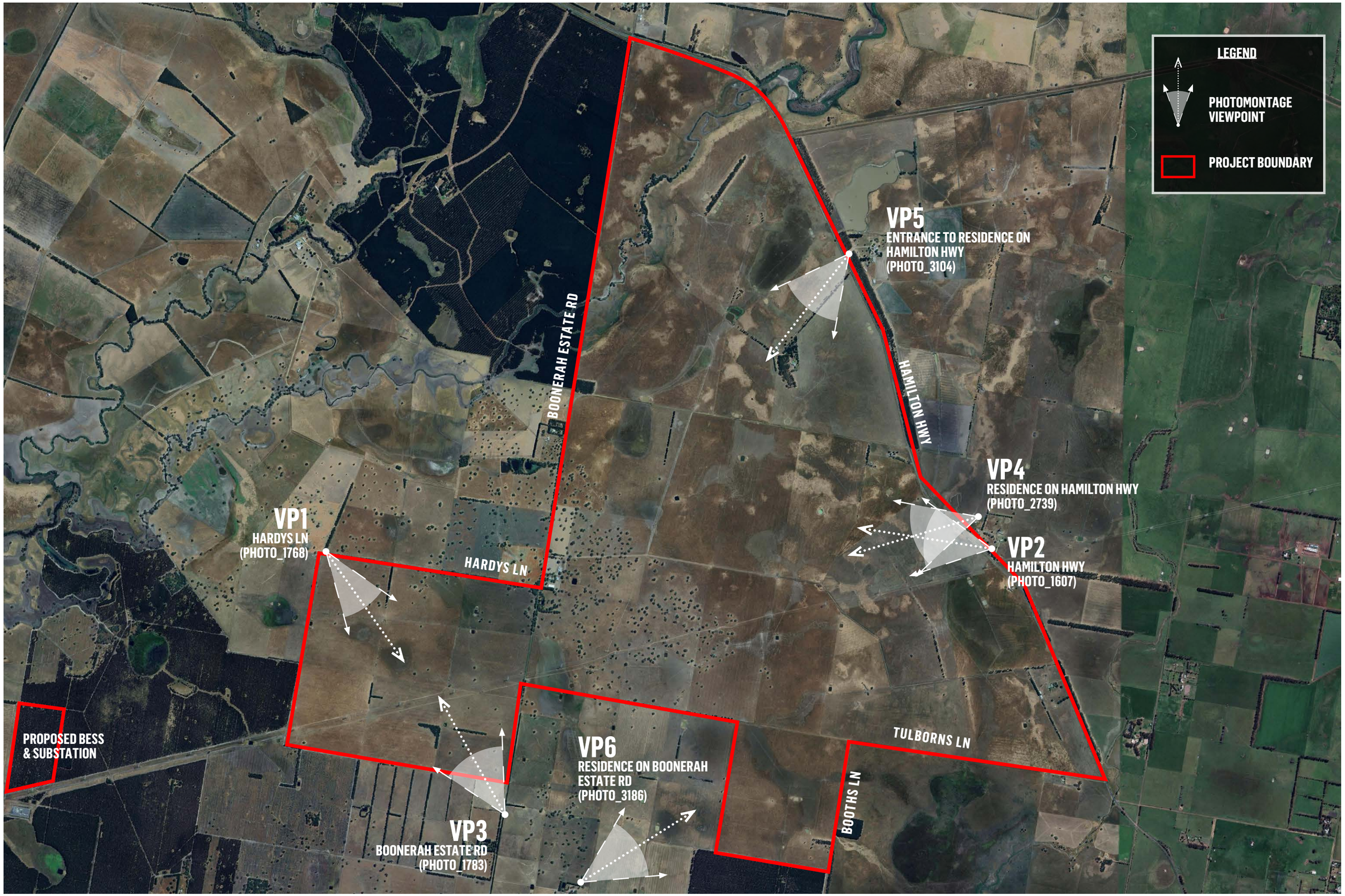
DATA SOURCES :

- Independent site survey received 2024-03-18
- Digital Elevation Models from Vicmap datasets - 2020-10
- Proposed landscape drawings received from Landscape Architect - 2024-04-12
- Proposed development CAD layout received - 2024-04-12

METHODOLOGY :

Photomontages provided on the following pages have been prepared as visual aids for the Visual Impact Assessment report. The process for producing these photomontages are outlined below:

- Photographs have been taken on site using a full-frame digital SLR camera coupled with a quality lens in order to obtain high resolution photos whilst minimising image distortion. Photos are taken handheld at a standing height of 1.60m above natural ground level. Photos have generally been taken at a standard focal length of 50mm, or 35mm to show a wider context. A photo taken using the 50mm focal length on a full-frame camera (equivalent to 40° horizontal field-of-view / 46.8° diagonal field-of-view) is an accepted photographic standard to approximate human vision.
- Using available geo-spatial data for the site, including independent site surveys, aerial photography, digital elevation models, the relevant datasets are validated and combined to form a geo-referenced base 3D model from which additional information, such as the proposed development, landscape and photographic viewpoints can be inserted.
- Layers of the proposed development are obtained from the designers as digital 3D models and/or 2D plans. All drawings/models are verified and registered to their correct geo-location before being inserted into the base 3D model.
- For each photo being used for the photomontage, the photo's GPS location, camera, lens, focal length, time/date and exposure information is extracted, checked and replicated within the 3D base model as a 3D camera. 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. Multiple reference points from the 3D survey are matched against features visible across the photos in order to generate an accurate match.
- From each viewpoint, a reference 3D model camera match is generated to verify an accurate match between the base 3D model (existing ground, survey features etc) and original photo. A 3D image of the 3D base model is rendered in the 3D modelling software and composited over the original photo using the photo-editing software.
- From each viewpoint, the final photomontage 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 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 photomontage.



URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

PHOTOMONTAGES - VIEW LOCATION MAP

DATE: 2024-04-26
JOB NO: P0040707
DWG NO:
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP1 (PHOTO 1768) : VIEW SOUTH-EAST FROM HARDYS LANE | EXISTING CONDITIONS 2023-11-02 11:58 AEDT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_1A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP1 (PHOTO 1768) : VIEW SOUTH-EAST FROM HARDYS LANE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_1B
REV: -

DISTANCE TO PROJECT - 140M
ORIGINAL PHOTO EXTENT - 50MM STANDARD VIEW

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP1 (PHOTO 1768) : VIEW SOUTH-EAST FROM HARDYS LANE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_1C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP2 (PHOTO 1607) : VIEW WSW FROM HAMILTON HWY | EXISTING CONDITIONS 2023-11-02 11:19 AEDT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_2A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP2 (PHOTO 1607) : VIEW WSW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_2B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP2 (PHOTO 1607) : VIEW WSW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_2C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP3 (PHOTO 1783) : VIEW NW ALONG BOONERAH ESTATE | EXISTING CONDITIONS 2023-11-02 12:10 AEDT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_3A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP3 (PHOTO 1783) : VIEW NW ALONG BOONERAH ESTATE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_3B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP3 (PHOTO 1783) : VIEW NW ALONG BOONERAH ESTATE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_3C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP4 (PHOTO 2793) : VIEW SW FROM HAMILTON HWY RESIDENCE | EXISTING CONDITIONS 2023-12-10 14:21 AEDT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_4A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP4 (PHOTO 2793) : VIEW SW FROM HAMILTON HWY RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_4B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP4 (PHOTO 2793) : VIEW SW FROM HAMILTON HWY RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_4C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP5 (PHOTO 3096): VIEW SW FROM HAMILTON HWY | EXISTING CONDITIONS 2024-03-14 10:27 AEDT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_5A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP5 (PHOTO 3096): VIEW SW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_5B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP5 (PHOTO 3096): VIEW SW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_5C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP6 (PHOTO 3179): VIEW NE FROM BOONERAH ESTATE RD RESIDENCE | EXISTING CONDITIONS 2024-03-14 11:11 AEDT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_6A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP6 (PHOTO 3179): VIEW NE FROM BOONERAH ESTATE RD RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_6B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP6 (PHOTO 3179): VIEW NE FROM BOONERAH ESTATE RD RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-26
JOB NO: P0040707
DWG NO: VP_6C
REV: -

APPENDIX 4

FORGESOLAR'S GLAREGAUGE: GLARE ANALYSIS RESULTS - 12° RESTING ANGLE SCENARIO

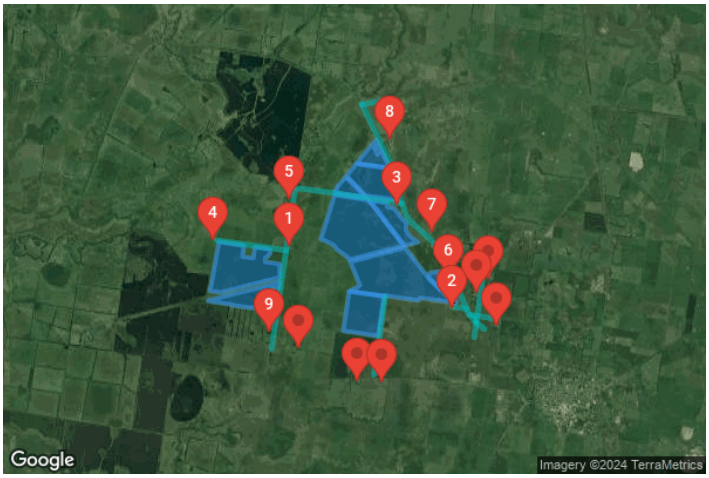
FORGESOLAR GLARE ANALYSIS

Project: **P0040707_Mortlake_SF**
Site configuration: **Layout20240318_12deg**

Client: BrightNight Power

Created 18 Apr, 2024
Updated 18 Apr, 2024
Time-step 1 minute
Timezone offset UTC10
Minimum sun altitude 0.0 deg
DNI peaks at 1,166.0 W/m^2
Category 100 MW to 1 GW
Site ID 117118.20041

Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
PV analysis methodology V2



Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV Array A	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array B	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array C	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array D	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array E	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array F	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array G	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array H	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array I	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array J	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

Component Data

PV Arrays

Name: PV Array A
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.019456	142.749974	138.92	1.63	140.55
2	-38.018679	142.750790	137.29	1.63	138.92
3	-38.025156	142.754835	139.93	1.63	141.56
4	-38.024063	142.745138	136.80	1.63	138.43
5	-38.019611	142.749811	139.50	1.63	141.13
6	-38.022012	142.751176	139.34	1.63	140.97
7	-38.021857	142.751339	139.58	1.63	141.21
8	-38.019456	142.749974	138.92	1.63	140.55

Name: PV Array B
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.024144	142.745053	136.84	1.63	138.47
2	-38.025254	142.754896	139.91	1.63	141.54
3	-38.025319	142.754936	139.90	1.63	141.53
4	-38.032553	142.757261	137.79	1.63	139.42
5	-38.031472	142.747677	133.72	1.63	135.35
6	-38.030777	142.746860	134.39	1.63	136.02
7	-38.030099	142.746022	136.31	1.63	137.94
8	-38.029944	142.745830	136.83	1.63	138.46
9	-38.027356	142.742631	136.47	1.63	138.10
10	-38.026472	142.742610	136.38	1.63	138.01
11	-38.024144	142.745053	136.84	1.63	138.47

Name: PV Array C
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.027115	142.741934	134.15	1.63	135.78
2	-38.031901	142.747792	133.63	1.63	135.26
3	-38.030846	142.738851	131.67	1.63	133.30
4	-38.029642	142.739326	131.82	1.63	133.45
5	-38.029423	142.739511	131.53	1.63	133.16
6	-38.027115	142.741934	134.15	1.63	135.78

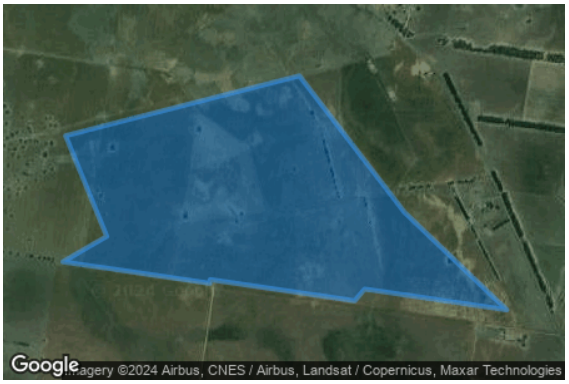
Name: PV Array D
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.031343	142.738657	131.37	1.63	133.00
2	-38.032504	142.748481	135.12	1.63	136.75
3	-38.033446	142.749484	137.11	1.63	138.74
4	-38.037872	142.753834	135.16	1.63	136.79
5	-38.041158	142.757056	134.82	1.63	136.45
6	-38.043016	142.758880	134.68	1.63	136.31
7	-38.046212	142.743007	127.48	1.63	129.11
8	-38.045968	142.742880	127.59	1.63	129.22
9	-38.045607	142.742362	127.92	1.63	129.55
10	-38.045012	142.741331	128.81	1.63	130.44
11	-38.044899	142.741135	129.02	1.63	130.65
12	-38.043824	142.739277	128.96	1.63	130.59
13	-38.043036	142.738563	127.71	1.63	129.34
14	-38.042908	142.738446	127.56	1.63	129.19
15	-38.041912	142.736075	126.49	1.63	128.12
16	-38.041519	142.734649	126.29	1.63	127.92
17	-38.031343	142.738657	131.37	1.63	133.00

Name: PV Array E
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.032554	142.748907	136.23	1.63	137.86
2	-38.033181	142.754232	138.33	1.63	139.96
3	-38.034091	142.754061	138.07	1.63	139.70
4	-38.034329	142.756058	137.99	1.63	139.62
5	-38.036807	142.758434	135.69	1.63	137.32
6	-38.037173	142.758935	135.16	1.63	136.79
7	-38.037835	142.759847	134.95	1.63	136.58
8	-38.038131	142.759749	134.72	1.63	136.35
9	-38.038539	142.759637	134.48	1.63	136.11
10	-38.038798	142.759597	134.31	1.63	135.94
11	-38.039053	142.759580	134.18	1.63	135.81
12	-38.039255	142.759617	134.10	1.63	135.73
13	-38.039452	142.759714	133.95	1.63	135.58
14	-38.039654	142.759784	133.91	1.63	135.54
15	-38.039891	142.759949	133.84	1.63	135.47
16	-38.040158	142.760152	133.73	1.63	135.36
17	-38.040372	142.760345	133.63	1.63	135.26
18	-38.040560	142.760536	133.60	1.63	135.23
19	-38.040808	142.760816	133.58	1.63	135.21
20	-38.041055	142.761168	133.28	1.63	134.91
21	-38.041175	142.761384	133.15	1.63	134.78
22	-38.041545	142.762056	132.69	1.63	134.32
23	-38.041832	142.762593	132.29	1.63	133.92
24	-38.042160	142.763136	131.95	1.63	133.58
25	-38.042956	142.759181	134.48	1.63	136.11
26	-38.033304	142.749706	137.33	1.63	138.96
27	-38.032554	142.748907	136.23	1.63	137.86

Name: PV Array F
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.046717	142.743271	126.93	1.63	128.56
2	-38.043482	142.759337	134.30	1.63	135.93
3	-38.049786	142.765522	131.72	1.63	133.35
4	-38.050854	142.766570	131.08	1.63	132.71
5	-38.053178	142.769678	132.01	1.63	133.64
6	-38.056103	142.773592	132.03	1.63	133.66
7	-38.054980	142.763820	128.37	1.63	130.00
8	-38.055613	142.763142	127.86	1.63	129.49
9	-38.054471	142.753213	129.58	1.63	131.21
10	-38.054667	142.753176	129.46	1.63	131.09
11	-38.053513	142.743085	124.91	1.63	126.54
12	-38.052144	142.746101	125.69	1.63	127.32
13	-38.050516	142.745252	126.05	1.63	127.68
14	-38.050420	142.745202	126.06	1.63	127.69
15	-38.046717	142.743271	126.93	1.63	128.56

Name: PV Array G
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.048965	142.768926	132.55	1.63	134.18
2	-38.050007	142.769614	134.23	1.63	135.86
3	-38.050092	142.769490	134.21	1.63	135.84
4	-38.052772	142.771235	134.76	1.63	136.39
5	-38.052744	142.771832	134.70	1.63	136.33
6	-38.052477	142.772388	134.57	1.63	136.20
7	-38.055882	142.774352	131.23	1.63	132.86
8	-38.056175	142.774219	131.28	1.63	132.91
9	-38.056159	142.774082	131.45	1.63	133.08
10	-38.050702	142.766782	131.18	1.63	132.81
11	-38.050214	142.766302	131.28	1.63	132.91
12	-38.049727	142.766423	131.74	1.63	133.37
13	-38.049280	142.766652	131.96	1.63	133.59
14	-38.048965	142.768926	132.55	1.63	134.18

Name: PV Array H
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.054667	142.753176	129.46	1.63	131.09
2	-38.063793	142.751464	127.20	1.63	128.83
3	-38.062594	142.741226	123.43	1.63	125.06
4	-38.053592	142.742911	124.83	1.63	126.46
5	-38.053513	142.743085	124.91	1.63	126.54
6	-38.054667	142.753176	129.46	1.63	131.09

Name: PV Array I
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.053784	142.705374	117.41	1.63	119.04
2	-38.053423	142.702173	116.64	1.63	118.27
3	-38.042139	142.704801	118.00	1.63	119.63
4	-38.042986	142.712146	120.99	1.63	122.62
5	-38.045509	142.711686	121.71	1.63	123.34
6	-38.045871	142.714868	122.78	1.63	124.41
7	-38.043346	142.715276	122.90	1.63	124.53
8	-38.043862	142.719760	123.85	1.63	125.48
9	-38.044835	142.719783	123.95	1.63	125.58
10	-38.045164	142.719290	124.00	1.63	125.62
11	-38.045495	142.719109	124.03	1.63	125.66
12	-38.045807	142.718285	123.99	1.63	125.62
13	-38.046724	142.718307	124.03	1.63	125.66
14	-38.047234	142.722605	125.47	1.63	127.10
15	-38.050304	142.722677	120.53	1.63	122.16
16	-38.053784	142.705374	117.41	1.63	119.04

Name: PV Array J
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 12.0°
Ground Coverage Ratio: 0.329
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.055648	142.701655	116.11	1.63	117.74
2	-38.051927	142.720150	120.16	1.63	121.79
3	-38.051893	142.719856	120.08	1.63	121.71
4	-38.051343	142.722596	120.56	1.63	122.19
5	-38.052839	142.722318	120.48	1.63	122.11
6	-38.052604	142.720291	120.09	1.63	121.72
7	-38.057753	142.719335	119.59	1.63	121.22
8	-38.057204	142.714497	118.88	1.63	120.51
9	-38.057364	142.714467	118.84	1.63	120.47
10	-38.056690	142.708509	117.83	1.63	119.46
11	-38.056534	142.708538	117.86	1.63	119.49
12	-38.055738	142.701634	116.07	1.63	117.70
13	-38.055648	142.701655	116.11	1.63	117.74

Route Receptors

Name: Route01_Hamilton Hwy
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.062265	142.782578	128.89	2.40	131.29
2	-38.061678	142.781821	129.00	2.40	131.40
3	-38.061084	142.780823	129.29	2.40	131.69
4	-38.060619	142.780175	129.68	2.40	132.08
5	-38.059497	142.778797	130.06	2.40	132.46
6	-38.058929	142.778270	129.98	2.40	132.38
7	-38.058526	142.777938	130.11	2.40	132.51
8	-38.058088	142.777636	130.17	2.40	132.57
9	-38.057528	142.777328	130.16	2.40	132.56
10	-38.054201	142.775534	131.58	2.40	133.98
11	-38.050149	142.773351	134.55	2.40	136.95
12	-38.046114	142.770876	134.49	2.40	136.89
13	-38.044179	142.769641	135.09	2.40	137.49
14	-38.043266	142.768850	137.01	2.40	139.41
15	-38.041380	142.766437	140.09	2.40	142.49
16	-38.039425	142.763710	140.05	2.40	142.45
17	-38.037560	142.761109	139.92	2.40	142.32
18	-38.036834	142.760289	139.42	2.40	141.82
19	-38.035880	142.759593	139.35	2.40	141.75
20	-38.033278	142.758406	139.99	2.40	142.39
21	-38.029743	142.757277	140.14	2.40	142.54
22	-38.025590	142.755951	140.59	2.40	142.99
23	-38.024826	142.755610	141.21	2.40	143.61
24	-38.023001	142.754502	143.23	2.40	145.63
25	-38.020916	142.753192	143.10	2.40	145.50
26	-38.017924	142.751348	136.91	2.40	139.31
27	-38.014104	142.748934	138.68	2.40	141.08
28	-38.010324	142.746574	138.67	2.40	141.07

Name: Route02_Boonerah Estate Rd
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.066728	142.720224	118.00	2.40	120.40
2	-38.063916	142.720746	118.95	2.40	121.35
3	-38.058351	142.721785	119.88	2.40	122.28
4	-38.054850	142.722428	120.49	2.40	122.89
5	-38.050580	142.723220	120.64	2.40	123.04
6	-38.047611	142.723806	126.46	2.40	128.86
7	-38.045508	142.724217	126.46	2.40	128.86
8	-38.044021	142.724481	125.99	2.40	128.39
9	-38.041722	142.724909	127.11	2.40	129.51
10	-38.032144	142.726683	129.49	2.40	131.89
11	-38.031113	142.726848	130.00	2.40	132.40
12	-38.030747	142.726962	129.46	2.40	131.86
13	-38.030640	142.727004	129.24	2.40	131.64
14	-38.030371	142.727190	128.48	2.40	130.88
15	-38.029995	142.727656	127.58	2.40	129.98
16	-38.029868	142.727901	127.34	2.40	129.74
17	-38.029799	142.728318	127.63	2.40	130.03
18	-38.030866	142.738187	134.12	2.40	136.52
19	-38.031341	142.742203	131.60	2.40	134.00
20	-38.031616	142.744509	132.19	2.40	134.59
21	-38.031912	142.747045	132.94	2.40	135.34
22	-38.032150	142.749055	137.07	2.40	139.47
23	-38.032419	142.751355	138.38	2.40	140.78
24	-38.032809	142.754735	138.51	2.40	140.91
25	-38.032963	142.756073	138.43	2.40	140.83
26	-38.033172	142.757779	137.24	2.40	139.64
27	-38.033235	142.758358	137.19	2.40	139.59

Name: Route03_Hardys Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.041796	142.704232	118.81	2.40	121.21
2	-38.042433	142.709871	120.20	2.40	122.60
3	-38.043068	142.715510	123.06	2.40	125.46
4	-38.043704	142.721149	123.59	2.40	125.99
5	-38.044078	142.724470	126.01	2.40	128.41

Name: Route04_Thulborns Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.057045	142.773183	132.17	2.40	134.57
2	-38.057110	142.773721	131.62	2.40	134.02
3	-38.057528	142.777328	130.16	2.40	132.56

Name: Route05_Booths Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.072738	142.750173	123.34	2.40	125.74
2	-38.065929	142.751457	127.17	2.40	129.57
3	-38.063585	142.751893	127.46	2.40	129.86
4	-38.061411	142.752259	127.44	2.40	129.84
5	-38.054778	142.753517	135.31	2.40	137.71

Name: Route06_Kings Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.048334	142.782499	134.27	2.40	136.67
2	-38.054121	142.781418	134.82	2.40	137.22
3	-38.059185	142.780442	131.40	2.40	133.80
4	-38.060619	142.780175	129.68	2.40	132.08

Name: Route07_Arnotts Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.059657	142.784721	133.62	2.40	136.02
2	-38.059173	142.780340	131.25	2.40	133.66
3	-38.058929	142.778270	129.98	2.40	132.38

Name: Route08_Racecourse Lane
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.064109	142.779604	128.16	2.40	130.56
2	-38.063912	142.779652	128.18	2.40	130.58
3	-38.063494	142.779749	128.26	2.40	130.66
4	-38.062912	142.779849	128.30	2.40	130.70
5	-38.061639	142.780036	128.56	2.40	130.96
6	-38.060619	142.780175	129.68	2.40	132.08

Name: Route09_Castle Carey Rd
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-38.009741	142.752020	134.47	2.40	136.87
2	-38.009859	142.751130	135.25	2.40	137.65
3	-38.010359	142.747823	138.55	2.40	140.95
4	-38.010535	142.746717	139.02	2.40	141.42

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-38.043321	142.725339	127.11	1.60
OP 2	2	-38.057431	142.773335	131.65	1.60
OP 3	3	-38.033858	142.756986	140.00	1.60
OP 4	4	-38.041993	142.703270	119.07	1.60
OP 5	5	-38.032487	142.725461	128.10	1.60
OP 6	6	-38.050501	142.772119	135.50	1.60
OP 7	7	-38.039905	142.767180	139.38	1.60
OP 8	8	-38.018567	142.755014	139.38	1.60
OP 9	9	-38.063076	142.719705	121.79	1.60
OP 10	10	-38.054028	142.780216	133.51	1.60
OP 11	11	-38.050773	142.783910	137.39	1.60
OP 12	12	-38.061509	142.786062	133.41	1.60
OP 13	13	-38.074502	142.752714	123.19	1.60
OP 14	14	-38.066752	142.728329	121.48	1.60
OP 15	15	-38.074442	142.745245	121.73	1.60

Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV Array A	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array B	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array C	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array D	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array E	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array F	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array G	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array H	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array I	SA tracking	SA tracking	0	0.0	0	0.0	-
PV Array J	SA tracking	SA tracking	0	0.0	0	0.0	-

Total glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV: PV Array A no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array A and Route: Route01_Hamilton Hwy

No glare found

PV Array A and Route: Route02_Boonerah Estate Rd

No glare found

PV Array A and Route: Route03_Hardys Lane

No glare found

PV Array A and Route: Route04_Thulborns Lane

No glare found

PV Array A and Route: Route05_Booths Lane

No glare found

PV Array A and Route: Route06_Kings Lane

No glare found

PV Array A and Route: Route07_Arnotts Lane

No glare found

PV Array A and Route: Route08_Racecourse Lane

No glare found

PV Array A and Route: Route09_Castle Carey Rd

No glare found

PV Array A and OP 1

No glare found

PV Array A and OP 2

No glare found

PV Array A and OP 3

No glare found

PV Array A and OP 4

No glare found

PV Array A and OP 5

No glare found

PV Array A and OP 6

No glare found

PV Array A and OP 7

No glare found

PV Array A and OP 8

No glare found

PV Array A and OP 9

No glare found

PV Array A and OP 10

No glare found

PV Array A and OP 11

No glare found

PV Array A and OP 12

No glare found

PV Array A and OP 13

No glare found

PV Array A and OP 14

No glare found

PV Array A and OP 15

No glare found

PV: PV Array B no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array B and Route: Route01_Hamilton Hwy

No glare found

PV Array B and Route: Route02_Boonerah Estate Rd

No glare found

PV Array B and Route: Route03_Hardys Lane

No glare found

PV Array B and Route: Route04_Thulborns Lane

No glare found

PV Array B and Route: Route05_Booths Lane

No glare found

PV Array B and Route: Route06_Kings Lane

No glare found

PV Array B and Route: Route07_Arnotts Lane

No glare found

PV Array B and Route: Route08_Racecourse Lane

No glare found

PV Array B and Route: Route09_Castle Carey Rd

No glare found

PV Array B and OP 1

No glare found

PV Array B and OP 2

No glare found

PV Array B and OP 3

No glare found

PV Array B and OP 4

No glare found

PV Array B and OP 5

No glare found

PV Array B and OP 6

No glare found

PV Array B and OP 7

No glare found

PV Array B and OP 8

No glare found

PV Array B and OP 9

No glare found

PV Array B and OP 10

No glare found

PV Array B and OP 11

No glare found

PV Array B and OP 12

No glare found

PV Array B and OP 13

No glare found

PV Array B and OP 14

No glare found

PV Array B and OP 15

No glare found

PV: PV Array C no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array C and Route: Route01_Hamilton Hwy

No glare found

PV Array C and Route: Route02_Boonerah Estate Rd

No glare found

PV Array C and Route: Route03_Hardys Lane

No glare found

PV Array C and Route: Route04_Thulborns Lane

No glare found

PV Array C and Route: Route05_Booths Lane

No glare found

PV Array C and Route: Route06_Kings Lane

No glare found

PV Array C and Route: Route07_Arnotts Lane

No glare found

PV Array C and Route: Route08_Racecourse Lane

No glare found

PV Array C and Route: Route09_Castle Carey Rd

No glare found

PV Array C and OP 1

No glare found

PV Array C and OP 2

No glare found

PV Array C and OP 3

No glare found

PV Array C and OP 4

No glare found

PV Array C and OP 5

No glare found

PV Array C and OP 6

No glare found

PV Array C and OP 7

No glare found

PV Array C and OP 8

No glare found

PV Array C and OP 9

No glare found

PV Array C and OP 10

No glare found

PV Array C and OP 11

No glare found

PV Array C and OP 12

No glare found

PV Array C and OP 13

No glare found

PV Array C and OP 14

No glare found

PV Array C and OP 15

No glare found

PV: PV Array D no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array D and Route: Route01_Hamilton Hwy

No glare found

PV Array D and Route: Route02_Boonerah Estate Rd

No glare found

PV Array D and Route: Route03_Hardys Lane

No glare found

PV Array D and Route: Route04_Thulborns Lane

No glare found

PV Array D and Route: Route05_Booths Lane

No glare found

PV Array D and Route: Route06_Kings Lane

No glare found

PV Array D and Route: Route07_Arnotts Lane

No glare found

PV Array D and Route: Route08_Racecourse Lane

No glare found

PV Array D and Route: Route09_Castle Carey Rd

No glare found

PV Array D and OP 1

No glare found

PV Array D and OP 2

No glare found

PV Array D and OP 3

No glare found

PV Array D and OP 4

No glare found

PV Array D and OP 5

No glare found

PV Array D and OP 6

No glare found

PV Array D and OP 7

No glare found

PV Array D and OP 8

No glare found

PV Array D and OP 9

No glare found

PV Array D and OP 10

No glare found

PV Array D and OP 11

No glare found

PV Array D and OP 12

No glare found

PV Array D and OP 13

No glare found

PV Array D and OP 14

No glare found

PV Array D and OP 15

No glare found

PV: PV Array E no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array E and Route: Route01_Hamilton Hwy

No glare found

PV Array E and Route: Route02_Boonerah Estate Rd

No glare found

PV Array E and Route: Route03_Hardys Lane

No glare found

PV Array E and Route: Route04_Thulborns Lane

No glare found

PV Array E and Route: Route05_Booths Lane

No glare found

PV Array E and Route: Route06_Kings Lane

No glare found

PV Array E and Route: Route07_Arnotts Lane

No glare found

PV Array E and Route: Route08_Racecourse Lane

No glare found

PV Array E and Route: Route09_Castle Carey Rd

No glare found

PV Array E and OP 1

No glare found

PV Array E and OP 2

No glare found

PV Array E and OP 3

No glare found

PV Array E and OP 4

No glare found

PV Array E and OP 5

No glare found

PV Array E and OP 6

No glare found

PV Array E and OP 7

No glare found

PV Array E and OP 8

No glare found

PV Array E and OP 9

No glare found

PV Array E and OP 10

No glare found

PV Array E and OP 11

No glare found

PV Array E and OP 12

No glare found

PV Array E and OP 13

No glare found

PV Array E and OP 14

No glare found

PV Array E and OP 15

No glare found

PV: PV Array F no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array F and Route: Route01_Hamilton Hwy

No glare found

PV Array F and Route: Route02_Boonerah Estate Rd

No glare found

PV Array F and Route: Route03_Hardys Lane

No glare found

PV Array F and Route: Route04_Thulborns Lane

No glare found

PV Array F and Route: Route05_Booths Lane

No glare found

PV Array F and Route: Route06_Kings Lane

No glare found

PV Array F and Route: Route07_Arnotts Lane

No glare found

PV Array F and Route: Route08_Racecourse Lane

No glare found

PV Array F and Route: Route09_Castle Carey Rd

No glare found

PV Array F and OP 1

No glare found

PV Array F and OP 2

No glare found

PV Array F and OP 3

No glare found

PV Array F and OP 4

No glare found

PV Array F and OP 5

No glare found

PV Array F and OP 6

No glare found

PV Array F and OP 7

No glare found

PV Array F and OP 8

No glare found

PV Array F and OP 9

No glare found

PV Array F and OP 10

No glare found

PV Array F and OP 11

No glare found

PV Array F and OP 12

No glare found

PV Array F and OP 13

No glare found

PV Array F and OP 14

No glare found

PV Array F and OP 15

No glare found

PV: PV Array G no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array G and Route: Route01_Hamilton Hwy

No glare found

PV Array G and Route: Route02_Boonerah Estate Rd

No glare found

PV Array G and Route: Route03_Hardys Lane

No glare found

PV Array G and Route: Route04_Thulborns Lane

No glare found

PV Array G and Route: Route05_Booths Lane

No glare found

PV Array G and Route: Route06_Kings Lane

No glare found

PV Array G and Route: Route07_Arnotts Lane

No glare found

PV Array G and Route: Route08_Racecourse Lane

No glare found

PV Array G and Route: Route09_Castle Carey Rd

No glare found

PV Array G and OP 1

No glare found

PV Array G and OP 2

No glare found

PV Array G and OP 3

No glare found

PV Array G and OP 4

No glare found

PV Array G and OP 5

No glare found

PV Array G and OP 6

No glare found

PV Array G and OP 7

No glare found

PV Array G and OP 8

No glare found

PV Array G and OP 9

No glare found

PV Array G and OP 10

No glare found

PV Array G and OP 11

No glare found

PV Array G and OP 12

No glare found

PV Array G and OP 13

No glare found

PV Array G and OP 14

No glare found

PV Array G and OP 15

No glare found

PV: PV Array H no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array H and Route: Route01_Hamilton Hwy

No glare found

PV Array H and Route: Route02_Boonerah Estate Rd

No glare found

PV Array H and Route: Route03_Hardys Lane

No glare found

PV Array H and Route: Route04_Thulborns Lane

No glare found

PV Array H and Route: Route05_Booths Lane

No glare found

PV Array H and Route: Route06_Kings Lane

No glare found

PV Array H and Route: Route07_Arnotts Lane

No glare found

PV Array H and Route: Route08_Racecourse Lane

No glare found

PV Array H and Route: Route09_Castle Carey Rd

No glare found

PV Array H and OP 1

No glare found

PV Array H and OP 2

No glare found

PV Array H and OP 3

No glare found

PV Array H and OP 4

No glare found

PV Array H and OP 5

No glare found

PV Array H and OP 6

No glare found

PV Array H and OP 7

No glare found

PV Array H and OP 8

No glare found

PV Array H and OP 9

No glare found

PV Array H and OP 10

No glare found

PV Array H and OP 11

No glare found

PV Array H and OP 12

No glare found

PV Array H and OP 13

No glare found

PV Array H and OP 14

No glare found

PV Array H and OP 15

No glare found

PV: PV Array I no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array I and Route: Route01_Hamilton Hwy

No glare found

PV Array I and Route: Route02_Boonerah Estate Rd

No glare found

PV Array I and Route: Route03_Hardys Lane

No glare found

PV Array I and Route: Route04_Thulborns Lane

No glare found

PV Array I and Route: Route05_Booths Lane

No glare found

PV Array I and Route: Route06_Kings Lane

No glare found

PV Array I and Route: Route07_Arnotts Lane

No glare found

PV Array I and Route: Route08_Racecourse Lane

No glare found

PV Array I and Route: Route09_Castle Carey Rd

No glare found

PV Array I and OP 1

No glare found

PV Array I and OP 2

No glare found

PV Array I and OP 3

No glare found

PV Array I and OP 4

No glare found

PV Array I and OP 5

No glare found

PV Array I and OP 6

No glare found

PV Array I and OP 7

No glare found

PV Array I and OP 8

No glare found

PV Array I and OP 9

No glare found

PV Array I and OP 10

No glare found

PV Array I and OP 11

No glare found

PV Array I and OP 12

No glare found

PV Array I and OP 13

No glare found

PV Array I and OP 14

No glare found

PV Array I and OP 15

No glare found

PV: PV Array J no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route01_Hamilton Hwy	0	0.0	0	0.0
Route02_Boonerah Estate Rd	0	0.0	0	0.0
Route03_Hardys Lane	0	0.0	0	0.0
Route04_Thulborns Lane	0	0.0	0	0.0
Route05_Booths Lane	0	0.0	0	0.0
Route06_Kings Lane	0	0.0	0	0.0
Route07_Arnotts Lane	0	0.0	0	0.0
Route08_Racecourse Lane	0	0.0	0	0.0
Route09_Castle Carey Rd	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0

PV Array J and Route: Route01_Hamilton Hwy

No glare found

PV Array J and Route: Route02_Boonerah Estate Rd

No glare found

PV Array J and Route: Route03_Hardys Lane

No glare found

PV Array J and Route: Route04_Thulborns Lane

No glare found

PV Array J and Route: Route05_Booths Lane

No glare found

PV Array J and Route: Route06_Kings Lane

No glare found

PV Array J and Route: Route07_Arnotts Lane

No glare found

PV Array J and Route: Route08_Racecourse Lane

No glare found

PV Array J and Route: Route09_Castle Carey Rd

No glare found

PV Array J and OP 1

No glare found

PV Array J and OP 2

No glare found

PV Array J and OP 3

No glare found

PV Array J and OP 4

No glare found

PV Array J and OP 5

No glare found

PV Array J and OP 6

No glare found

PV Array J and OP 7

No glare found

PV Array J and OP 8

No glare found

PV Array J and OP 9

No glare found

PV Array J and OP 10

No glare found

PV Array J and OP 11

No glare found

PV Array J and OP 12

No glare found

PV Array J and OP 13

No glare found

PV Array J and OP 14

No glare found

PV Array J and OP 15

No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not automatically consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

URBIS

MORTLAKE ENERGY HUB

VISUAL ASSESSMENT | PHOTOMONTAGES

PREPARED FOR
BRIGHTNIGHT POWER
APRIL 2024

PHOTOMONTAGES PREPARED BY:

Urbis, Level 10, 477 Collins Street, MELBOURNE 3000.

DATE PREPARED :

23 April 2024

VISUALISATION ARTIST :

Ashley Poon, Urbis – Lead Visual Technologies Consultant
Bachelor of Planning and Design (Architecture) with over 20 years' experience in 3D visualisation

Enisa Muranovic, Urbis – Visual Technologies Consultant
Bachelor of Design (Landscape Architecture)

Manuel Alvelo, Urbis – Design Assistant
Bachelor of Architecture and student in Masters of Urban Planning and Environment

LOCATION PHOTOGRAPHER :

Enisa Muranovic, Urbis – Visual Technologies Consultant, Bachelor of Design (Landscape Architecture) under direction from Jane Maze-Riley, Urbis - Director, National Design

CAMERA :

Canon EOS 6D Mark II - 26 Megapixel digital SLR camera (Full-frame sensor)

CAMERA LENS AND TYPE :

Canon EF 24-105mm f/4L IS USM

SOFTWARE USED :

- 3DSMax 2023 with Arnold 5.0 (3D Modelling and Render Engine)
- AutoCAD 2022 (2D CAD Editing)
- Globalmapper 23 (GIS Data Mapping / Processing)
- Photoshop CC 2022 (Photo Editing)

DATA SOURCES :

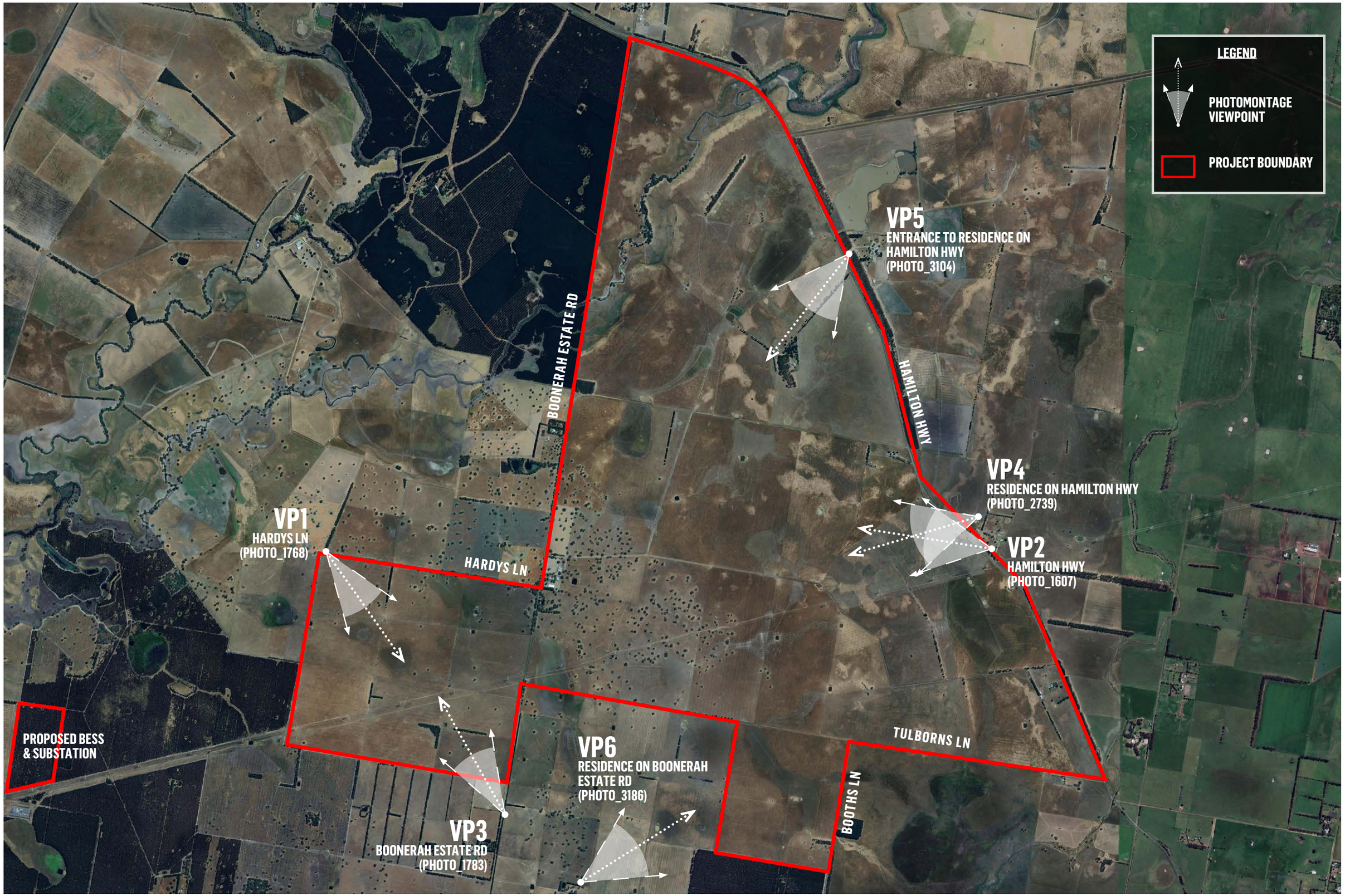
- Independent site survey received 2024-03-18
- Digital Elevation Models from Vicmap datasets - 2020-10
- Proposed landscape drawings received from Landscape Architect - 2024-04-12
- Proposed development CAD layout received - 2024-04-12

METHODOLOGY :

Photomontages provided on the following pages have been produced to comply with the guidelines for the preparation of visual aids for the Victorian Civil and Administrative Tribunal (VCAT).

The process for producing these photomontages are outlined below:

- Photographs have been taken on site using a full-frame digital SLR camera coupled with a quality lens in order to obtain high resolution photos whilst minimising image distortion. Photos are taken handheld at a standing height of 1.60m above natural ground level. Photos have generally been taken at a standard focal length of 50mm. A photo taken using the 50mm focal length on a full-frame camera (equivalent to 40° horizontal field-of-view / 46.8° diagonal field-of-view) is an accepted photographic standard to approximate human vision.
- Using available geo-spatial data for the site, including independent site surveys, aerial photography, digital elevation models, the relevant datasets are validated and combined to form a geo-referenced base 3D model from which additional information, such as proposed architecture, landscape and photographic viewpoints can be inserted.
- Layers of the proposed development are obtained from the designers as digital 3D models and/or 2D plans. All drawings/models are verified and registered to their correct geo-location before being inserted into the base 3D model.
- For each photo being used for the photomontage, the photo's GPS location, camera, lens, focal length, time/date and exposure information is extracted, checked and replicated within the 3D base model as a 3D camera. 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, a reference 3D model camera match is generated to verify an accurate match between the base 3D model (existing ground, survey features etc) and original photo. A 3D image of the 3D base model is rendered in the 3D modelling software and composited over the original photo using the photo-editing software.
- From each viewpoint, the final photomontage 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 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 photomontage.



URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

PHOTOMONTAGES - VIEW LOCATION MAP

DATE: 2024-04-23
JOB NO: P0040707
DWG NO:
REV: -

ORIGINAL PHOTO EXTENT - 50MM STANDARD VIEW

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP1 (PHOTO 1768) : VIEW SOUTH-EAST FROM HARDYS LANE | EXISTING CONDITIONS 2023-11-02 11:58 AEDT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_1A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP1 (PHOTO 1768) : VIEW SOUTH-EAST FROM HARDYS LANE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_1B
REV: -

DISTANCE TO PROJECT - 140M
ORIGINAL PHOTO EXTENT - 50MM STANDARD VIEW

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP1 (PHOTO 1768) : VIEW SOUTH-EAST FROM HARDYS LANE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_1C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP2 (PHOTO 1607) : VIEW WSW FROM HAMILTON HWY | EXISTING CONDITIONS 2023-11-02 11:19 AEDT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_2A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP2 (PHOTO 1607) : VIEW WSW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_2B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP2 (PHOTO 1607) : VIEW WSW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_2C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP3 (PHOTO 1783) : VIEW NW ALONG BOONERAH ESTATE | EXISTING CONDITIONS 2023-11-02 12:10 AEDT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_3A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP3 (PHOTO 1783) : VIEW NW ALONG BOONERAH ESTATE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_3B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP3 (PHOTO 1783) : VIEW NW ALONG BOONERAH ESTATE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_3C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP4 (PHOTO 2793) : VIEW SW FROM HAMILTON HWY RESIDENCE | EXISTING CONDITIONS 2023-12-10 14:21 AEDT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_4A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP4 (PHOTO 2793) : VIEW SW FROM HAMILTON HWY RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_4B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP4 (PHOTO 2793) : VIEW SW FROM HAMILTON HWY RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_4C
REV: -

50MM STANDARD VIEW REFERENCE

ORIGINAL PHOTO EXTENT - 35MM STANDARD VIEW

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP5 (PHOTO 3096): VIEW SW FROM HAMILTON HWY | EXISTING CONDITIONS 2024-03-14 10:27 AEDT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_5A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP5 (PHOTO 3096): VIEW SW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_5B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP5 (PHOTO 3096): VIEW SW FROM HAMILTON HWY | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_5C
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP6 (PHOTO 3179): VIEW NE FROM BOONERAH ESTATE RD RESIDENCE | EXISTING CONDITIONS 2024-03-14 11:11 AEDT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_6A
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP6 (PHOTO 3179): VIEW NE FROM BOONERAH ESTATE RD RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_6B
REV: -

URBIS

MORTLAKE SOLAR FARM - VISUAL ASSESSMENT

VP6 (PHOTO 3179): VIEW NE FROM BOONERAH ESTATE RD RESIDENCE | PHOTOMONTAGE - PROPOSED DEVELOPMENT WITH LANDSCAPE AT 5YRS

DATE: 2024-04-23
JOB NO: P0040707
DWG NO: VP_6C
REV: -