

Mologa Solar Farm and BESS

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Landscape and Visual Impact Assessment

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Prepared For

Potentia Energy Australia

July 2026

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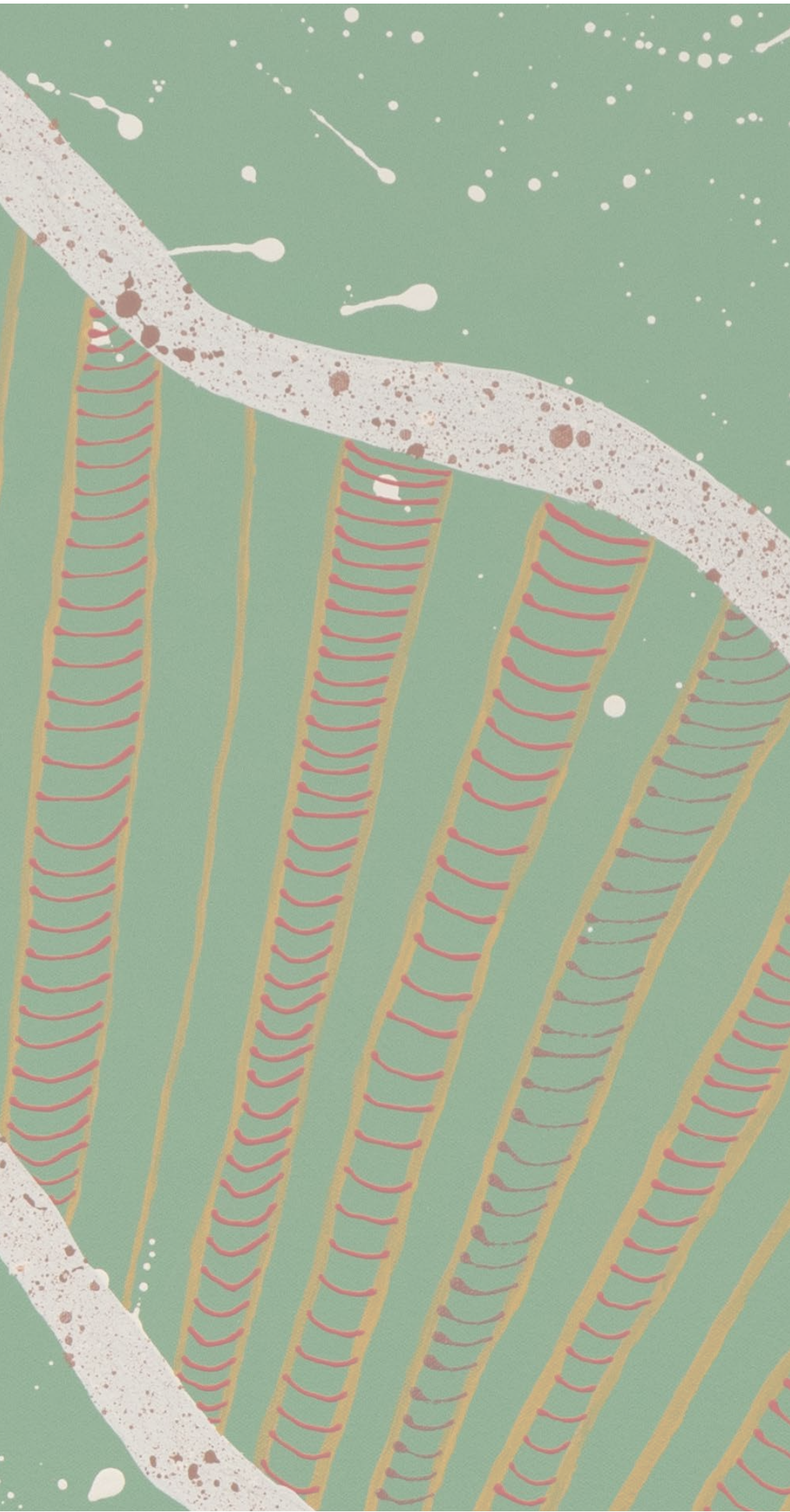
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Glossary of abbreviations / Key technical terms

Term	Definition	Abbreviation
Battery Energy Storage System	A BESS (Battery Energy Storage System) is a large-scale technology that utilises rechargeable battery units to store electrical energy, typically from renewable sources like solar, for later use and to provide backup, or shift energy to meet peak demand.	BESS
Cumulative impacts	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.	
Landscape character	Landscape character relates to a recognisable and consistent pattern of physical and visual elements in a landscape which, when combined, separate one landscape area from another, typically referred to as “zones”. The concept relies on various landscape features such as; underlying topography, the presence of water bodies, unique features for example rock outcrops and cliffs, and vegetation.	
Residual impact	The effectiveness of the mitigation measures proposed in the landscape and visual impacts resulting from the Project is demonstrated by comparing the visual impact during initial operation with the residual impact when the mitigation measures have been implemented and successfully established within a nominated period.	
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.	
Viewer sensitivity	A judgement as to the likely level of private interest in views to a proposed development and the potential for private views to be negatively affected by a proposal. The spatial relationship (distance), the part of a dwelling from which views may be affected etc affect viewer sensitivity. For example a ‘sensitive viewer’ would be considered as a residence located in close proximity of a site boundary with clear, direct views to a part of the proposal, from a primary living area, or associated outdoor space, block parts of an existing view.	
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 as the distance increases from a proposed development to a sensitive land use area, the level of viewer sensitivity decreases based on a perceptual dis-association based on a reduction in relative proximity.	
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.	
Visual absorption capacity	Visual absorption capacity means the extent to which the existing physical environment can reduce or eliminate the perception of the visibility of the proposed redevelopment. VAC includes the ability of existing elements of the landscape to physically hide, screen or disguise the proposal.	VAC
Victorian Department of Transport and Planning	The consent authority for the proposed project	DTP
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. The visibility of any proposed development varies depending on constraints such as any 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.	
Visual effects	Refers to the visible extent of a proposal or visual change often described in quantitative terms. Visual effects are objective, that is they can be seen however visual effects do not directly equate to a visual impact.	
Zone of Visual Influence	A Zone of Visual Influence map is a computer-generated analysis using Geographical Information Systems (GIS) and satellite imagery to identify areas from which it is theoretically possible to view the project. The ZVI map typically considers landform only and does not consider buildings, trees or other intervening factors that may screen views of the project.	ZVI

Executive summary

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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 and BESS facility on land in Mologa, north of Bendigo, in Central-Northern Victoria.

There are no specific guidelines for carrying out an LVIA in Victoria, therefore this LVIA has been prepared utilising several industry recognised national and international guidelines and requirements within the *Solar Energy Facilities Design and Development Guidelines*, Victorian Department of Environment, Land, Water and Planning (VDELWP).

Landscape character

- The landscape is predominantly characterised by vernacular topography and scenic quality. The subject site and immediate visual context is not characterised by any unique visual landform, waterbodies, geology, vegetation or soils.
- Three Landscape Character Zones (LCZ) were identified across the study area these included; Agricultural Plains (LCZ1), Cypress Pine Woodland (LCZ2) and Creek Corridor (LCZ3)
- Impacts on LCZ1 and LCZ2 were assessed as Moderate-Low and Low for LCZ3 when considering the visual effects on Sensitivity and Magnitude.
- The project has a high Visual Absorption Capacity (VAC) with the existing visual environment to an extent that the fundamental landscape character of the wider visual context, and sub-regional visual character area will remain unchanged and unaffected by the proposal.

Visual

- Viewshed analysis and fieldwork observations in relation to patterns of viewing found that direct views to any part of the subject site or proposed development are limited and constrained to close locations due to the effects of intervening landform, vegetation, location and orientation of dwellings, relative viewing heights and road alignment.
- Three viewpoints, two public roads and one (1) private dwelling, were selected for assessment due to their proximity and potential visibility. The VIA concluded that there were Low impacts for all VPs due to either Low or Very Low Magnitude or Low Sensitivity ratings of the unmitigated proposal.
- Views from a private dwelling located at 7405 Bendigo-Pyramid Road (VP4) were tested by inspection, and based on fieldwork and desktop analysis, such views are unlikely to be occupied by any significant extent of the proposal. It is determined that the operational view impact is low.
- Views from Mologa-Durham Ox Road (VP11) near a dwelling located at number 5 were tested by inspection, and based on fieldwork and desktop analysis, such views are unlikely to be occupied by any significant extent of the proposal. It is determined that the operational view impact is low.
- Visual effects from construction-related activity are potentially visible such as site works and construction vehicles accessing the site from Bendigo-Pyramid Road but are anticipated to be temporary, ie a period of approximately one year.
- Based on the proposed layout and the recommended resting angles of the solar panels, we anticipate no glare impacts for the Project for all assessed receptors within 1km.
- Visual mitigation using vegetated screening is proposed along the project site boundaries to assist with visual integration of the project with the landscape particularly from Bendigo-Pyramid Road.
- There are limited viewing opportunities to the BESS facility given its location and relative visual isolation within the northern part of the site.
- When considering all the above factors, the proposed development can be supported on landscape character and visual impacts grounds.

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01 Introduction

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1.1 Purpose of the report

Potentia Energy Pty Ltd (Potentia) are proposing to develop the Mologa Solar Farm and associated Battery Energy Storage System (BESS) on land located in Mologa, northern-central Victoria. Urbis Ltd (Urbis) has been engaged by Potentia to prepare a Landscape and Visual Impact Assessment (LVIA) in support of a Planning Permit application to the Victorian Department of Transport and Planning (DTP).

The LVIA follows an objective, logical process to determine the potential impacts on existing landscape character and visual amenity within the study area associated with the development of the proposed solar farm. The findings of the assessment is used to inform recommendations for mitigation measures, where required, to reduce identified potential impacts.

1.2 Project description

The Mologa Solar Hybrid project (the project) is located approximately 65km north of Bendigo and 51km west of Echuca. The site is located to the east of Bendigo-Pyramid Road and south of Mologa-Durham Ox Road, in Mologa. The site extends across approximately 591 hectares and is currently used predominantly for dryland cropping and some grazing.

The subject site is described by the following Certificates of Title:

- Crown Allotment 6 Section A Parish of Mologa.
o Volume: 9056 & Folio: 961
- Crown Allotment 7 Section A Parish of Mologa
o Volume: 2429 & Folio: 740
- Crown Allotment 8 Section A Parish of Mologa
o Volume: 7628 & Folio: 185
- Crown Allotment 17 Section A Parish of Mologa
o Volume: 9056 & Folio: 962
- Crown Allotment 17A, 18A, & 18 Section A Parish of Mologa
o Volume: 10991 & Folio: 175
- Crown Allotment 17B Section A Parish of Mologa
o Volume: 2667 & Folio: 397
- Crown Allotment 17C Section A Parish of Mologa
o Volume: 10407 & Folio: 536

The proposed solar hybrid project comprises:

- 250 MW solar farm
- 250 MW 4 hour Battery Energy Storage System (BESS)
- Substation
- Mologa Terminal Station
- A 220 kV transmission line easement runs north-south through the western side of the site. The proposed BESS and substation will connect directly to this existing line, enabling efficient integration with the grid.

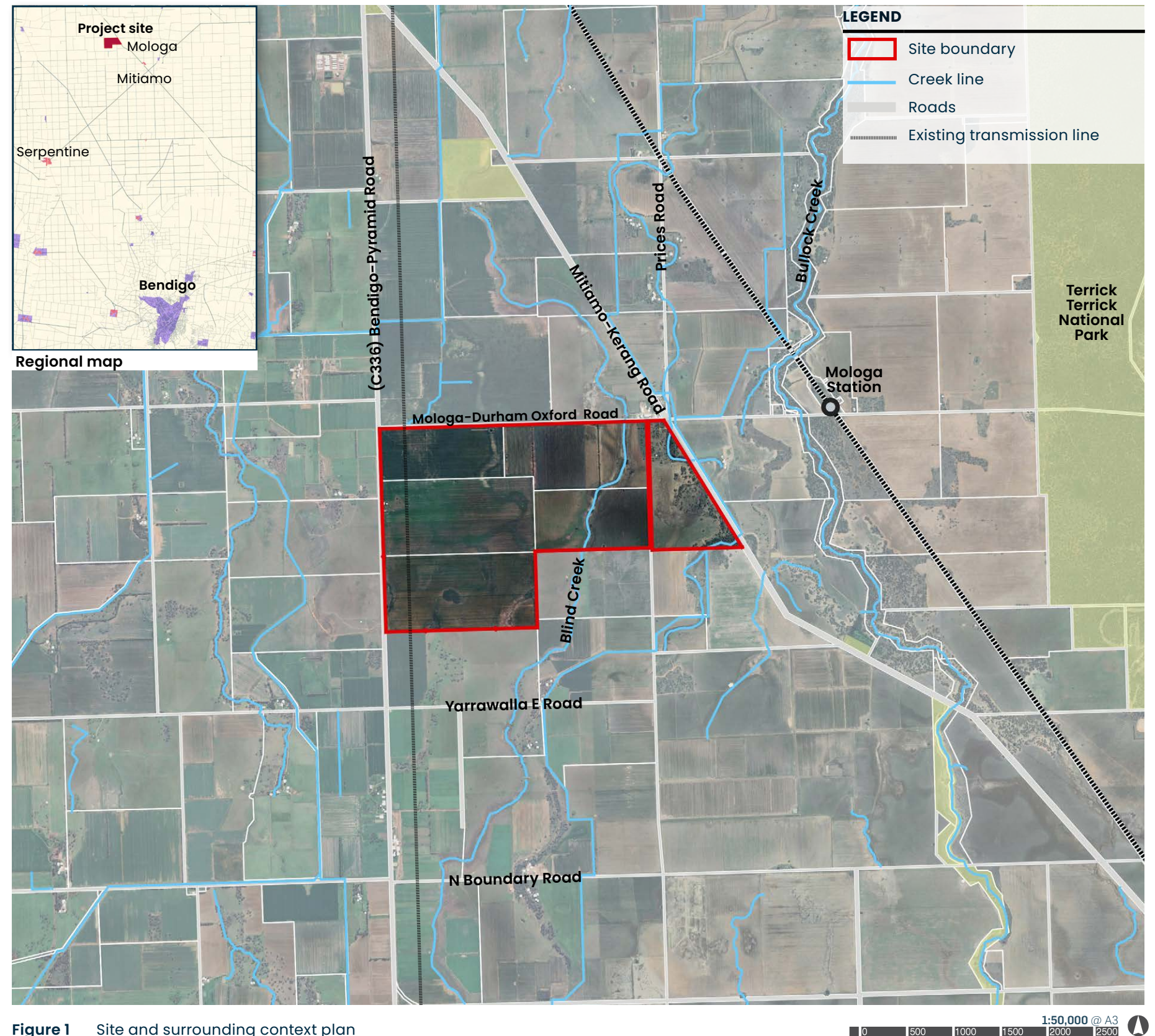


Figure 1 Site and surrounding context plan

02 Methodology

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2.1 Approach

LVIAs require the comparison of existing landscape and visual values against the potential changed conditions of the proposed development. There are no direct guidelines for carrying out an LVIA in Victoria.

This report has been prepared to address the requirements within the Solar Energy Facilities Design and Development Guidelines, Victorian Department of Environment, Land, Water and Planning (VDELWP), (October, 2022) namely to prepare;

“accurate visual simulations illustrating the development in the context of the surrounding area and from key public viewpoints”

and assessment of;

“– the visual impact of the proposal on the surrounding landscape”.

More broadly, Urbis has developed a tailored methodology for this LVIA based on the following industry guidelines;

- *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).
- *Technical Supplement - Landscape and Visual Impact Assessment, Large-Scale Solar Energy Guideline*, NSW Department of Planning and Environment (DPE) (2022).

2.2 Report content

The LVIA comprises separate assessments for the landscape character and visual impacts for both the construction and operation of the Project. The LVIA is broadly comprised of the following sections;

- Review of the existing site and visual context
- A landscape character assessment – identification of character types and evaluation of the proposed development impacts on existing landscape character and values within the broader context.
- An assessment of potential visual impacts – relying on a qualitative assessment of visual modification at key representative public and private viewpoints – understanding how the proposal would contrast with the landscape character of that visual setting.
- A technical assessment using specialist software of potential glint and glare impacts to identify locations that are found to be detrimental to visual amenity.
- Recommendations for mitigation measures in response to amenity impacts on public and private receivers.
- Review of cumulative impacts of the project in relation to the wider central Victorian broader renewable energy landscape context.

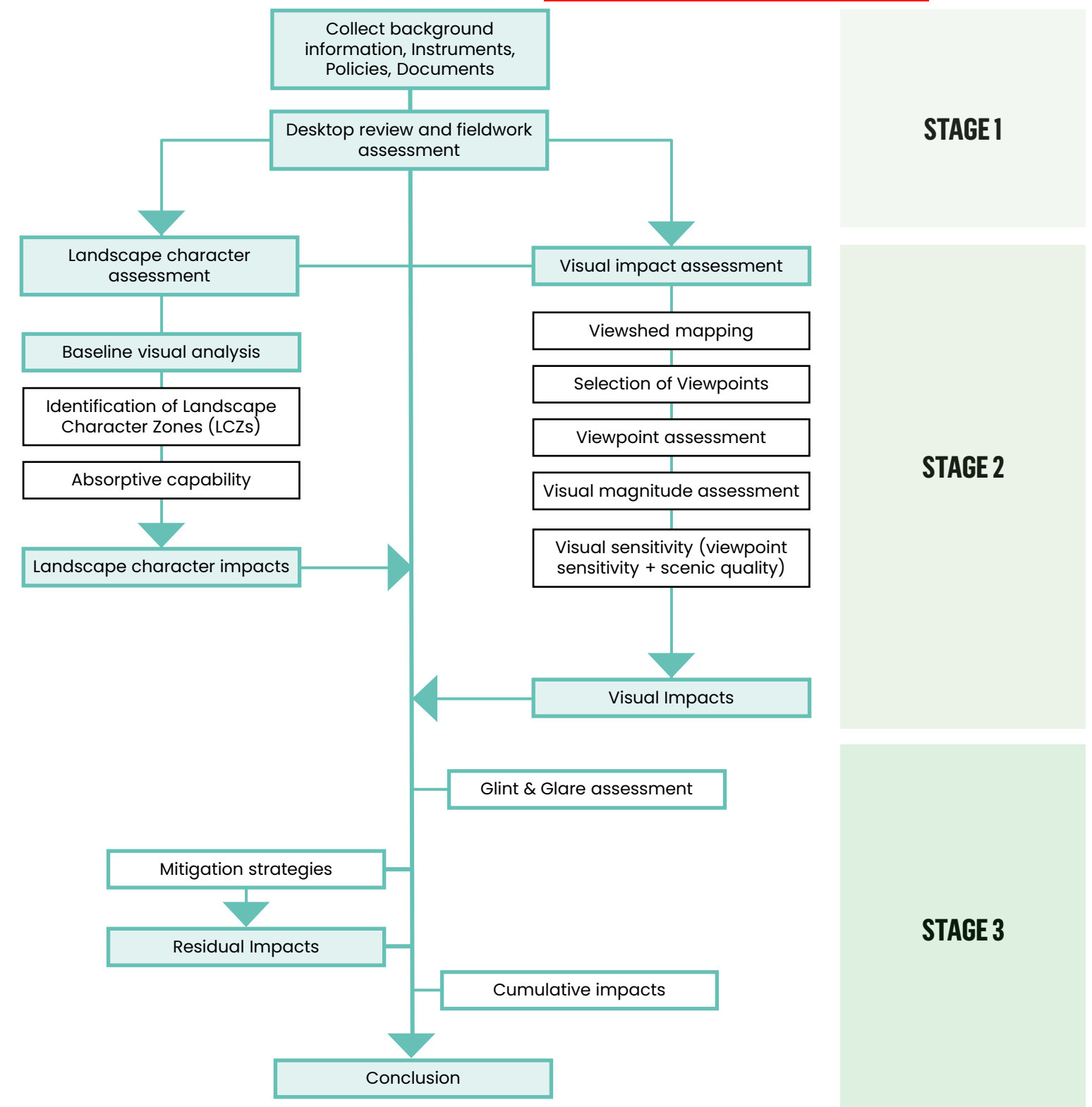


Figure 2 Methodology flowchart

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2.3 Study area

For the purposes of this assessment, the project site and the study area are defined as:

- Project site – The area that the project components are located within
- Study area – the area investigated that includes the site and surrounding area.

A study area buffer up to 5 km is used as a guide to assess landscape character and visual impacts. The buffer extent was verified in early desktop viewshed analysis and confirmed as part of the fieldwork undertaken in mid-November 2025 that involved reviewing locations in surrounding areas to confirm potential visibility.

The buffer comprises a broad landscape area beyond the subject site as it takes in land uses, topography, vegetation and settlement patterns.

2.4 Landscape character

This LVIA includes an assessment of how the project will affect the elements that make up the landscape, the aesthetic and perceived aspects of the landscape and its unique character.

Landscape character zones (LCZs) are identified, described and assessed in this LVIA to better understand the potential impacts of the project. Impacts are measured by assigning ratings for the magnitude of the project and sensitivity of the landscape to determine a qualitative assessment rating of 'High', 'Moderate' or 'Low'.

Analysis of the existing environment identifies and describes the elements that comprise the landscape in the study area. The following landscape features are typically considered;

- Landform
- Waterways or other drainage
- Human-made elements such as roads, buildings or other structures
- Ecological characteristics
- Key landscape features or attributes,
- Aboriginal and non-Aboriginal cultural heritage
- Past and present land uses including condition
- Planning designations relating to landscape character, and
- Direct or indirect cumulative impacts from existing or approved large-scale energy developments within the local or regional context.

2.5 Visual impacts

Visual impacts include an analysis of the theoretical viewshed of the Project, identification of sensitive viewpoint locations, and an assessment of the Project from the selected, highest sensitivity viewpoints, with a rating given for the level of visual modification and sensitivity which, when combined with other factors, result in a determination of the degree of overall visual effects for each viewing location.

Scenic quality

The scenic quality assists in determining the sensitivity of each LCZ and "...refers to the relative scenic, cultural or aesthetic value of the landscape within the viewshed based on the presence or absence of key landscape features known to be associated with community perceptions of low, moderate, or high scenic quality." (DPE, 2022).

The landscape character analysis is used to inform the classification of scenic quality values and a scenic quality rating is applied as part of the visual impact assessment. The scenic quality rating is based on the scenic quality values identified in Tables 6 and 7 of the DPE Technical Supplement (DPE, 2022).

Glint and glare

Minimising the light reflected from solar panels is a goal of panel design, manufacture and installation. The dark, non-reflective nature of a solar array is generally considered to help minimise their visual contrast with the surrounding landscape.

The glint and glare assessment has been undertaken using ForgeSolar software, with the annual hours for green and yellow glare calculated for identified observation points, typically roads and residences.

The analysis does not consider obstacles between the observation points and the proposed solar array that may obstruct observed glare, such as trees, topography and, buildings, etc., and can, therefore, be considered a worst-case scenario.

An assessment of glint and glare impacts can be found in section 7.

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2.6 Assessment of impacts

The LVIA is based on analysis and characterisation of the landscape and visual setting and an assessment of potential impacts within the visual catchment in relation to that setting.

Landscape character

Assessment involves evaluating the sensitivity of the landscape and the magnitude of the project's effects in that area. Sensitivity refers to how sensitive the landscape is to the proposed change and the inherent capability of the area to absorb changes from the project.

Magnitude of change refers to the physical scale of the project and is assessed based on factors such as:

- Size and scale including;
 - the extent of existing landscape elements that may be lost and the contribution of that element to the character of the landscape.
 - the extent to which the project becomes a minor or major element in the landscape and its dominance in the visual catchment.
 - the extent to which the project changes the key characteristics of the landscape, which are critical to its distinctive character.
- Geographical area – the area of the landscape over which the effects will be experienced, with regard to the nature and scale of the project's effects. This may vary from the local site setting to larger scales where the project may influence several landscape characters zones.
- Duration and reversibility of the effects on the landscape.

Each LCZ is assigned a sensitivity and magnitude rating (low, moderate or high) used to determine the overall landscape character impact on that zone. Table 1 includes a matrix used to determine the overall landscape character impact based on the assigned ratings.

		MAGNITUDE OF CHANGE		
SENSITIVITY		High	Moderate	Low
	High	High	High-Moderate	Moderate
	Moderate	High-Moderate	Moderate	Moderate-Low
	Low	Moderate	Moderate-Low	Low

Table 1 Landscape character impact rating matrix

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Visual

Assessment involves a comprehensive review of visual impacts on public and private viewpoints identified in the desktop analysis and field work. The critical issues that are considered include:

- The number and location of sensitive viewing locations
- The duration of the view – either static (generally long term – > 1 hour) and mobile (generally short term continually moving and static for no longer than 5 minutes)
- The degree to which the proposed works would be visible
- The scenic quality of the landscape setting; and
- The degree to which the Project contrasts or is compatible with the visual character of the setting, ie. Magnitude of change.

Sensitivity

Viewer sensitivity is a judgement as to the likely level of public and private interest in the views that include the proposed development. Visual sensitivity is a measure of how critically a change to the existing environment would be viewed from various land uses. Different activities have different sensitivity levels. For example, tourists on holiday would generally view changes to a landscape more critically than industrial workers in the same area. Similarly, individuals would view changes to the visual setting of their dwellings more critically than changes to the broader area in which they travel or work.

Magnitude of change

A professional judgement is made as to 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.

An overall impact rating is determined for each accessible viewpoint by combining the visual magnitude and visual sensitivity using the matrix in Table 2. Additional ratings of ‘Very-low’ and ‘Very-high’ to the landscape character matrix are included to address inherent nuances for visual assessment such as the addition of scenic quality in the considerations.

The assessment method assumes that if the Project would not be seen, there is no impact.

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2.7 Preparation of photomontages

Photomontages reflect, as close as is reasonably possible, the likely effects of the project on views from specific points. Their accuracy is critical to the assessment process and informed stakeholder engagement.

The preparation of accurate visualisation involves the use of multiple digital platforms and according to well defined processes and protocols. The photomontage methodology is guided by industry accepted techniques recommended in *Visual Representation of Development Proposals: Technical Guidance Note 06/19* (Landscape Institute, 2019).

All photographic images are captured typically using a 35 or 50 millimetre focal length lens on a 35 millimetre full frame format camera. All photograph Global Positioning System (GPS) locations are recorded and mapped.

Of all viewpoint locations identified, particular viewpoints are selected for the production of photomontage images to represent proposed views following the completion of the project.

The software used to model and render the photomontages includes Autodesk 3D Studio Max. In order to achieve an accurate photomontage of the Proposal and surrounding landscape, a digital terrain model to a resolution of five metres is used to model the surrounding landform.

Once the 3D model incorporating both the landscape and the project elements is created, a virtual camera is placed in the software at the same location the photographs are taken. The film, focal lens and height of the virtual camera matches the real camera utilised to take the photographs. The photographs of the study area are used in 3D Studio Max as a background to accurately match the 3D model with the project elements to the perspective of the photographs. From the camera view, rendered images of the project are produced to match the daylight exposure of the photographs. The rendered images are then imported into Adobe Photoshop for post-production editing and collation of the photomontages. The final result is the 3D model of the project shown in the correct 3D location in the photographs.

2.8 Mitigation

This process involves determining whether any visual management objectives identified can be achieved, and provision of mitigation and management measures to reduce negative impacts identified through the assessment. The mitigation and management measures relate to both the landscape character zones as well as views.

MAGNITUDE OF CHANGE					
SENSITIVITY		High	Moderate	Low	Very-low
	Very high	High	High	Moderate	Moderate
	High	High	Moderate	Moderate	Low
	Moderate	Moderate	Moderate	Low	Low
	Low	Moderate	Low	Low	Very-low
	Very-low	Low	Low	Very-low	Very-low

Table 2 Visual impact rating matrix

03 Baseline visual analysis

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3.1 Planning considerations

Loddon Shire (The Shire) is located in north-central Victoria, The Loddon Planning Scheme sets out the vision and strategic direction for the municipality.

Mologa is classified as a rural locality and the Loddon Mallee South Regional Growth Plan identifies the subject site as being to; *“Facilitate ongoing agricultural productivity and new opportunities that respond to climate change through ongoing adaptation and flexibility.”* (p 21).

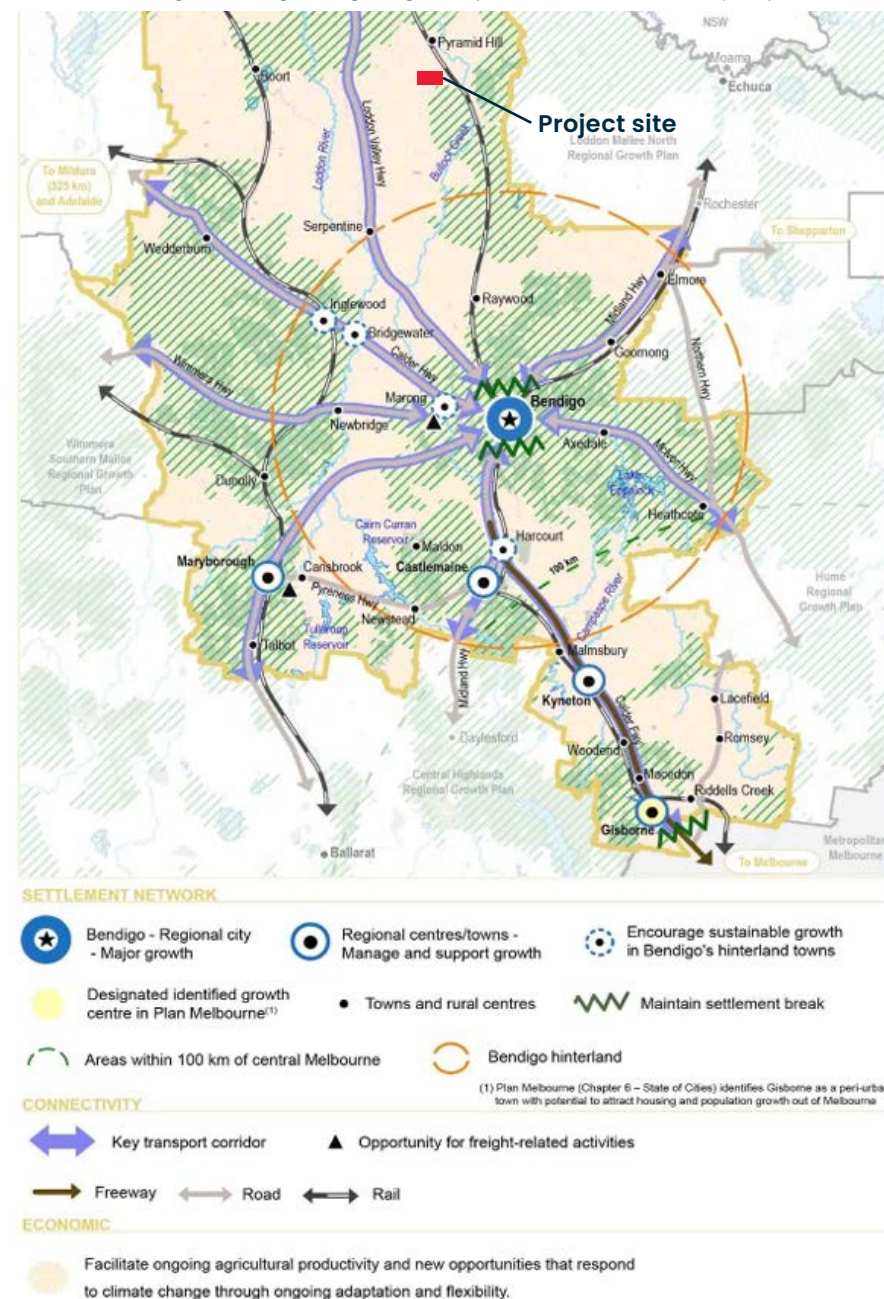


Figure 3 Loddon Mallee South Regional Growth Plan

3.2 Regional and local context

The Shire is a rural municipality containing farmland, forest, native grasslands, lakes, rivers and wetlands interspersed with small townships and hamlets. The Shire is located within the Loddon and Avoca River catchments and Mologa is located within the Murray Darling Depression bioregion. The project site is located approximately 3km west of the Terrick Terrick National Park. The park protects some of the last remaining native vegetation on Victoria's northern plains.



Image 1 View north along Pyramid-Yarraberb Road south of the Project



Image 2 View west from Mt Terrick Terrick towards the subject site

3.3 Scenic quality

The project site is located within the Riverina Plains landscape, characterized by generally flat, agricultural land with limited natural screening from land formations. The scenic quality is largely defined by extensive, open rural views. Key landscape features that contribute to the scenic quality include: agricultural activity, sparse vegetation, open skies and vistas and relatively low-scale built form development relating to agricultural and energy supply uses.

The scenic quality of the landscape character type of the Project area and its surrounds, is described here as;

Landforms – Flat to slightly undulating landform with occasional low hills. Lightly incised waterways.

Vegetation – Open and extensive agricultural clearings, scattered vegetation and linear buffer planting.

Waterforms – Small permanent and intermittent waterways such as farm dams and creeks.

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3.4 Land use and zoning

Land use

The site and surrounding allotments are predominantly used for agricultural purposes. A small residential settlement is located at Pyramid Hill (north-west) however, the closest major towns are Bendigo and Echuca. Surrounding residential development typically includes single storey farm dwellings, agricultural sheds and various outbuildings.

Energy transmission infrastructure is evident with high voltage transmission lines traversing the Project site and beyond. Transport infrastructure includes regional access and local roads as well as a disused rail line and the former Mologa station.

Other land uses in the area include the Terrick Terrick National Park approximately 3km to the east comprising White Cypress Pine open forest and granite outcrops. The region is part of a broader, active mineral and gold exploration and mining occurring in Northern Victoria.

Zoning

The site is located within Loddon Shire Council and is zoned Farming Zone (FZ) within the Loddon Shire Planning Scheme. 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. The relevant requirements of the FZ include:

- To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture
- 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.

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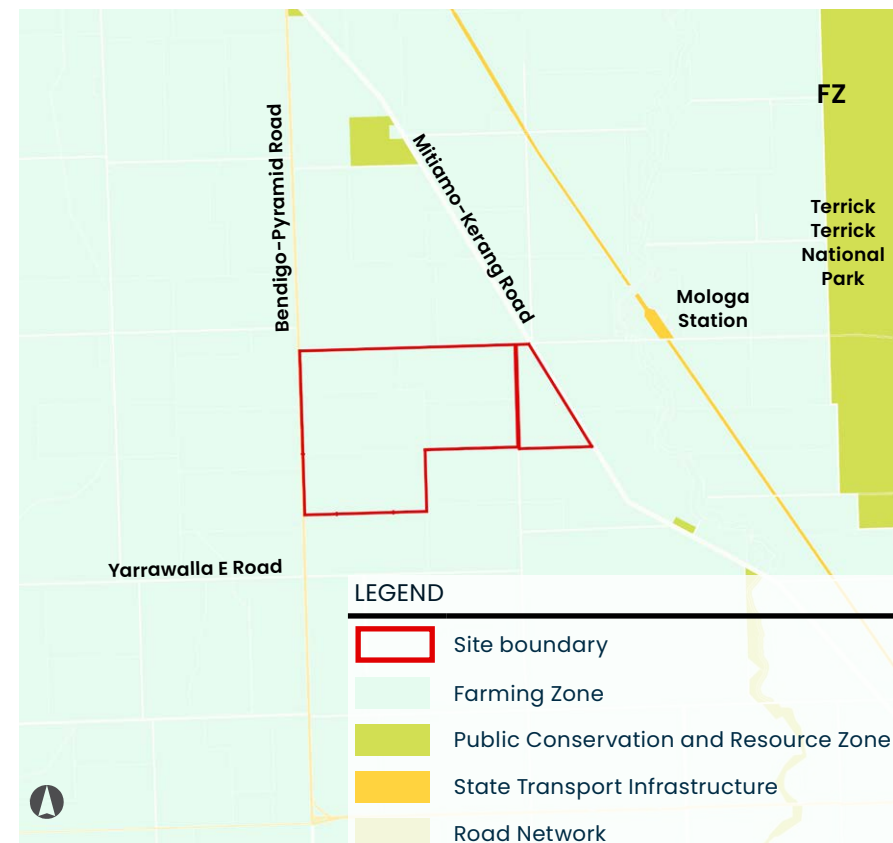


Figure 4 Land zone map



Image 3 Agricultural grain stores Mitiamo township



Image 4 Terrick Terrick National Park White Cypress Pine forest



Image 5 Farming zone example

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3.5 Topography

Site topography and vegetation are important considerations in determining the visual catchment, overall landscape character and scenic quality.

The landform of the subject site and surrounding area is characterised by the flat, low-lying terrain of the Loddon Plains, part of the broader Riverine Plain. Situated at approximately 90–100 meters above sea level, the area lacks significant hills or natural rises.

The landform is visually characterised by distant elevated ridgelines and sloping hills including forested landforms as part of Terrick Terrick National Park (Mt Terrick Terrick 197m).

The overall area's flat topography minimises the number of elevated view opportunities towards the project, and open views of the project are reduced the further away the viewpoint is located.

Bullock Creek, east of the project site, is a significant seasonal waterway that forms part of a larger, rural drainage network located between Durham Oxford and Mitiamo. Blind Creek is a secondary seasonal waterway that runs north-south nearly parallel to Bullock Creek through the project site.

3.6 Trees and vegetation

The Project site is mostly treeless, with any substantial vegetation confined to road and paddock boundaries or waterways. Trees and vegetation found within the site are confined to linear planted rows along farming parcels in the northern area of the site.

The Bullock Creek follows the Project site's eastern boundary, is sinuous and lightly incised below the plain. Its edges are lined with relatively dense, tall vegetation.

The two vegetation types primarily found in the area include;

- Plains Grassy Woodland – Typically sparse understorey, featuring scattered shrubs and a ground layer of native perennial grasses such as Kangaroo Grass (*Themeda triandra*).
- Riverine and Riparian Vegetation – found along the corridors of Bullock Creek and Blind Creek, typical species include; River Red Gum (*Eucalyptus camaldulensis*), Silver Wattle (*Acacia dealbata*), sedges like Tall Sedge (*Carex appressa*), and various rushes (*Juncus spp.*)

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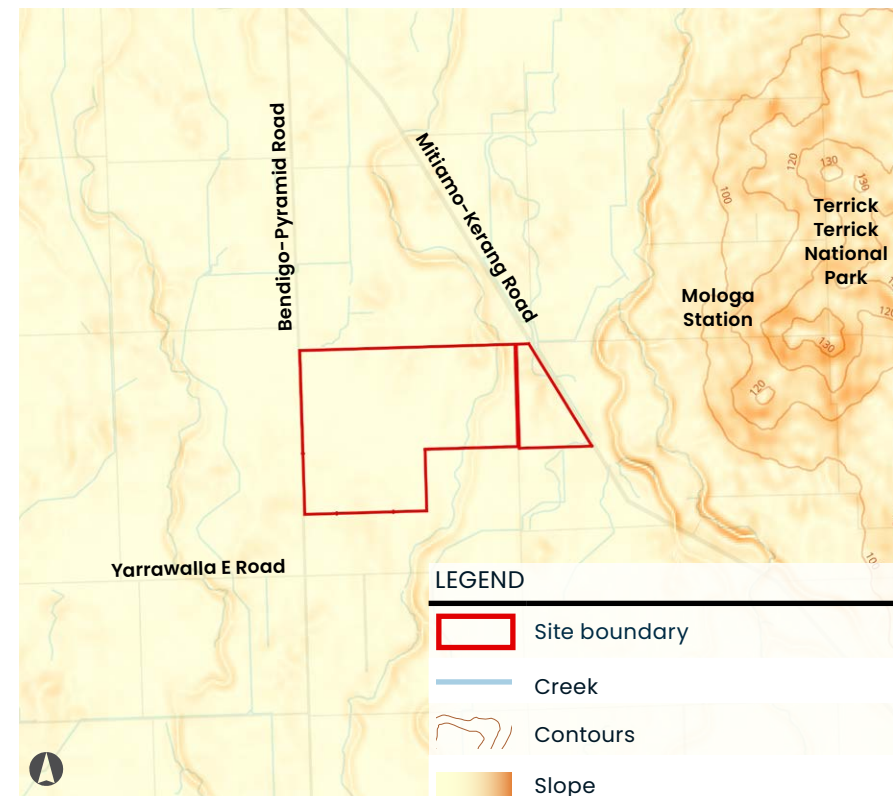


Figure 5 Topography map

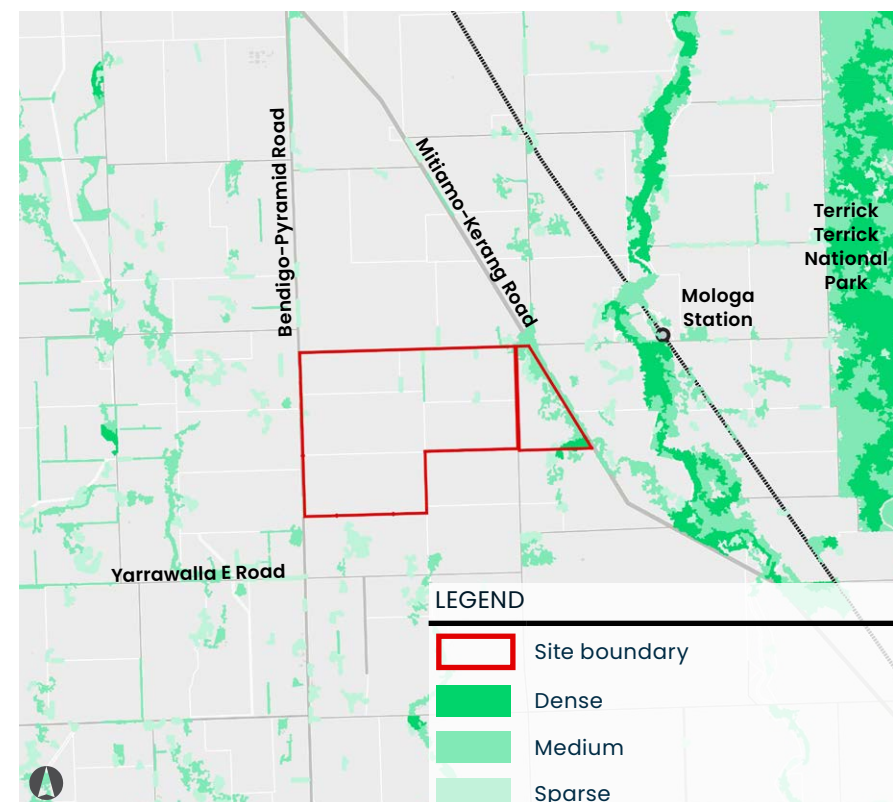


Figure 6 Tree density map



Image 6 View towards the Mt Terrick Terrick lookout and highpoint



Image 7 Example of linear boundary screen break planting

3.7 Heritage and Indigenous cultural values

A Cultural Heritage Due Diligence Assessment (DDA) was prepared by Urbis in December 2025. The DDA was prepared to provide a legislative context of the study area regarding Aboriginal cultural heritage and to assess the Aboriginal archaeological potential of the study area.

The study area is located within an area of Aboriginal cultural heritage sensitivity as defined by the Aboriginal Heritage Regulations 2018. The DDA found that there were no Aboriginal Places identified within the study area and therefore would be no direct impacts by the project in terms of either the landscape or visual elements.

The former Mologa Township Area is situated at the junction of the Durham Ox and Echuca Roads with the Bendigo Swan Hill railway. Previous heritage studies have identified the Township as being “historically, aesthetically and socially important” (Loddon Shire Heritage Study, 1999) although very little visible fabric remains. The Victorian Heritage Database includes one heritage item located in the former railway grounds approximately 1km east of the project site.

- Mologa WWI Memorial Obelisk Railway Ground Mologa, Loddon Shire

This local heritage feature, located about 1km from the Project site has a very small role in the overall landscape character owing to its small scale and relative isolation and therefore would not be impacted by the project..



Image 8 Mologa WWI Memorial Obelisk (Victorian Heritage Database)

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3.8 Landscape character

Within the regional setting of the Project, the landscape character has been identified based on the built, natural and cultural features of the existing environment. The landscape character is determined by the dominant visual quality and visual value for a given area taking into account:

- Aesthetic and perceptual qualities – scale, complexity, openness, natural aspects
- Physical attributes – terrain, vegetation cover, built form, the presence of waterways or water bodies
- Land use – existing and emerging

Landscape Character Zone (LCZ) definition

Urbis determined from our context analysis that there were three LCZs in the study area based on the above criteria;

- LCZ1 – Agricultural Plains
- LCZ2 – Cypress Pine Woodlands
- LCZ3 – Creek corridor

The key characteristics and dominant features of these LCZs provide the baseline for evaluating the potential impacts associated with the proposal on landscape character and visual amenity.

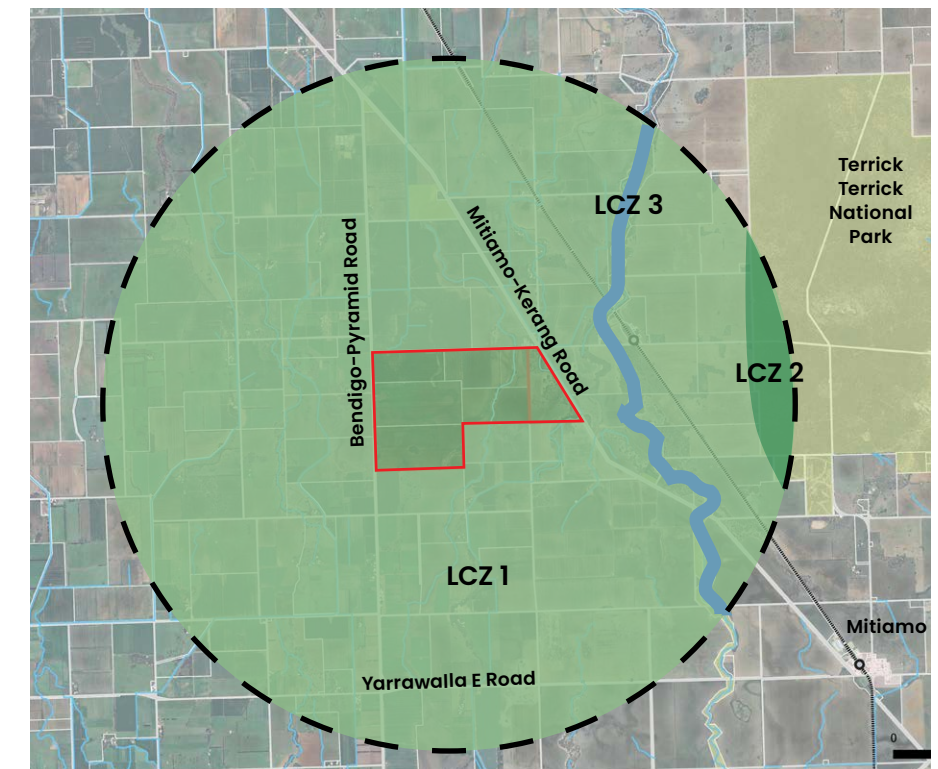


Figure 7 Landscape Character Zones map within 5km

LEGEND

- Site boundary
- LCZ 1 – Agricultural Plains
- LCZ 2 – White Cypress Pine Woodlands
- LCZ 3 – Creek corridor

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LCZ 1 – Agricultural Plains

Key characteristics

- Wide open views across a generally flat landscape with open sky
- Rural roads, typically gravel, with scattered native trees along both verges
- Dispersed buildings and structures typically rural dwellings and farm sheds set back from roadways
- Rural industrial infrastructure such as grain silos, railway tracks, transmission lines and towers, power poles
- Modified landscape used extensively for agriculture with pockets of native vegetation on farm land.



Image 9 LCZ 1 – Agricultural Plains



Image 12 LCZ 1 – Transmission infrastructure

LCZ 2 – Cypress Pine Woodlands

Key characteristics

- South-western edge of Terrick Terrick National Park 3km to the east
- Semi-open forest of predominantly White Cypress Pine (*Callitris columellaris*)
- Granite outcrops at high points
- Dirt access tracks
- Little if any visible infrastructure or built structure
- Typically open ground plain with scattered under-story vegetation or features impeding views beyond the immediate location.



Image 10 LCZ 2 – Cypress Pine Woodlands



Image 13 LCZ 2 – Granite outcrop

LCZ 3 – Creek corridor

Key characteristics

- Shallow incised creek lines generally following the Bullock Creek corridor
- Remnant native bushland including riverine species such as River Red gum (*Eucalyptus camaldulensis*)
- Typically semi-open ground plain with scattered under-story grass and vegetation or features impeding views beyond the immediate location
- Minimal built structure apart from rural fencing.



Image 11 LCZ 3 – Creek corridor

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04 Project description

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4.1 Site design

The solar energy facility includes a panel area of 240 hectares with a BESS facility to be located in the north-western corner of the project site accompanying a Terminal Station and Switchyard. Mologa Terminal Station is to be connected into the existing overhead 220 kV network between Kerang Terminal Stations to Bendigo Terminal Station.

The facility will require the installation of the following infrastructure:

- Approximately 500,000 photovoltaic (PV) panels, mounted on tracking frames that are pile-driven into the ground without concrete foundations. The mounting posts are 'H' or 'Z' section steel piles, resulting in minimal ground disturbance and no requirement for bulk excavation. the panels will be mounted on single-axis tracking systems, allowing them to tilt and follow the sun from east to west throughout the day.
- Approximately 76 power conversion units (PCUs) mounted on metal piers (steel posts or columns rather than a full concrete slab). These units will be distributed throughout the panel array and will connect back to the BESS and substation.
- A BESS and Substation Compound, within which the BESS units (approximately 272 containerised batteries and 68 inverters) will be installed on reinforced concrete hardstand pads, designed to accommodate structural loads and site-specific ground conditions.

The following infrastructure will be located within the compound:

- Containerised BESS modules
- A single transformer substation forming the on-site point of connection
- Ancillary buildings, including:
 - o Control room
 - o Switchgear room
 - o Operations and maintenance (O&M) building
 - o Workshop
 - o Storage building
 - o Dedicated water storage tanks
 - o Fire protection infrastructure, including fire breaks, hydrants, suppression systems.

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Figure 8 Example of a Terminal Station and BESS facility (Source: Potentia Energy)



Figure 9 Girgarre Solar Farm central Victoria (Source: Potentia Energy)



Figure 10 Indicative 40 foot BESS container (Source: Konka Energy)

4.2 Detail of the project components

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.

Mologa Terminal Station including:

- Bench and drainage
- Security, lighting and fencing
- Rack structures, plant and equipment structures and associated footings
- Buildings and amenities including associated step platforms
- Conduits and cable trench works
- Lightning protection
- Earth grid and structure earthing connections
- Batteries and station supplies.

220 kV Switchyard including:

Benched area for two breaker and one-half diameters, including primary plant, interplant connections, marshalling boxes, GPO and lightning protection:

One breaker and one-half diameters installed as a double switched breaker bay to connect the KGTS 220 kV Line.

One breaker and half diameter, installed with a single breaker in the bay, connecting the BETS 220 kV Line and Potentia's overhead line.

Cut in tower

Replacement of an existing High Voltage (HV) tower in the same location with a 220kV Transmission Tower the base measuring approximately 15m x 15m and an approximate height ranging between 45m up to a maximum of 60m.

Mologa Terminal Station including:

Equipment includes:

- Switchroom/Control Building, Length = 20m, Width = 5m
- 220kV DTCB, Height = 7m (with high steel support structure)
- CVT, Height = 5m (without structure)
- Disconnect/ESW/ROI, Height = 8m (with steel support structure)
- Surge Arresters, Height = 5m (with steel support structure)
- CCTV Pole, Height = 5m
- 220kV Gantry, Length = 30m, Height = 24m
- Earthwire Mast, Height = 24m
- Weather station pole (if applicable), Height = 8m

Ancillary works including:

The project will also include the following ancillary infrastructure:

- Laydown areas for equipment, machinery, materials, waste storage, and stockpiling.
- Internal access roads comprising unsealed, compacted crushed-rock tracks constructed throughout the site to provide all-weather access.
- Perimeter fire breaks - generally comprise cleared and compacted mineral earth and/or crushed rock surfaces, maintained free of vegetation to provide fuel-free separation zones and emergency vehicle access.
- Perimeter security fencing and lighting infrastructure.
- Landscape buffers comprising high, medium, and low-density trees and shrubs, generally approximately 5 metres in width.
- Water storage tanks for the solar farm component, located at designated emergency access points.

4.3 The project in visual terms

The subject area is an irregular shaped lot bordered by a sealed (C336) Bendigo-Pyramid Road, a regional connector, as well as unsealed, local access roads such as Mitiamo-Kerang Road to the east and Mologa-Durham Oxford Road to the north. The site is largely flat and generally clear of vegetation.

The proposed solar panels are ground-mounted solar photovoltaic modules, affixed on a single axis tracking system approximately 3.2m above ground.

Visually the panels will appear as dark, flat rectangular panels approximately 3.2m in height above natural ground level. In visual terms, on mass, the panels will be present as a continuous, low-height, linear horizontal profile within the landscape.

The proposed BESS is to be grouped into containerised modules and setback from the project boundaries. The entire project will be fenced, and all operational vehicle access points gated thereby further reducing potential visibility of the BESS.

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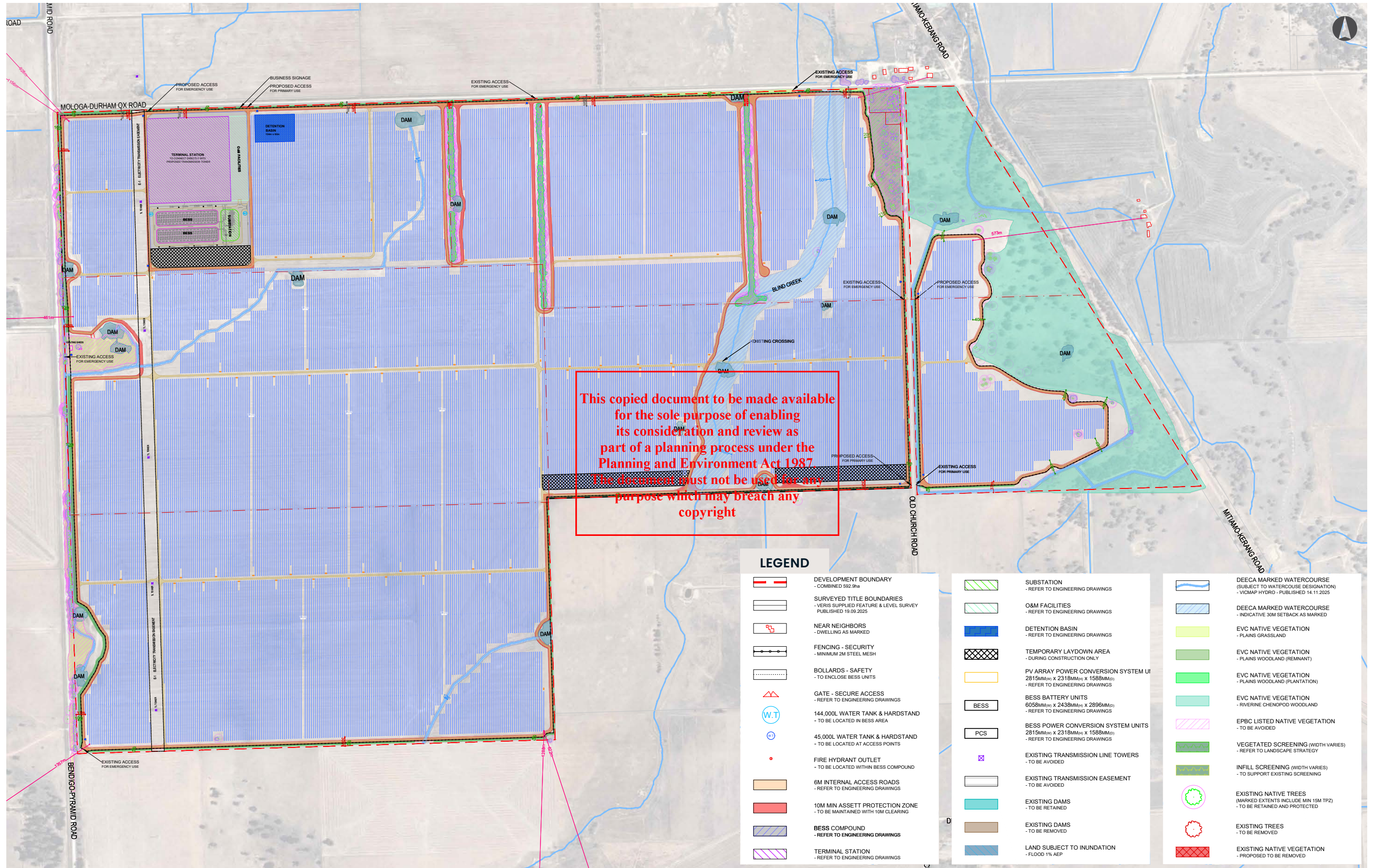


Figure 11 Site plan with indicative layout of project components | Urbis

05 Landscape character impacts

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5.1 LCZ Assessment

An assessment of the potential impacts associated with the project has been carried out for each of the LCZs identified within the study area based on the matrix in Table 3. The measurement of visual impact is based on a combination of sensitivity relative to the proposed visual change, or magnitude of the proposal, against a particular LCZ.

Landscape Character Zone	Sensitivity	Magnitude	Landscape Character Impact Rating
LCZ 1- Agricultural Plains	Moderate - The landscape is modified, evident through the widespread clearance of native vegetation, the presence of roadways, dwellings, ancillary agricultural buildings and infrastructure. - No specific planning controls attribute special or unique value to this LCZ. - The landscape elements that contribute to its quality will remain unchanged. - The proposal would not adversely disrupt any key landscape features of this LCZ.	Low - The relatively low height of the PV arrays and associated infrastructure means that they will only be visible from close proximity at locations where there is little or no screening vegetation. - The proposal will occupy a relatively small part of this LCZ. - The proposal will generate visual change within the landscape in close, direct views from nearby roads, however the extent of this change is minor relative to the extent of this LCZ. - The LCZ is considered to have some capacity to absorb the type of visual change introduced by the proposal.	Moderate-Low
LCZ 2 - Cypress Pine Woodland	Moderate - This LCZ has unique features including elevated granite outcrops and native White Pine forest as part of a National Park although there is limited formal access to most areas. - The landscape elements that contribute to its quality will remain unchanged. - The proposal would not adversely disrupt any key landscape features of this LCZ.	Low - Direct views to the project are at a distance of more than 3km are available from the top of Mt Terrick Terrick only and include wide panoramic landscape. - The proposal will not occupy this LCZ. - The proposal will generate only a minor visual change within the landscape in views.	Moderate-Low
LCZ 3 - Creek corridor	Low - This LCZ is not visually unique and can tolerate the type of change introduced by the proposal. - No specific planning controls attribute special or unique value to this LCZ. - The landscape elements that contribute to its quality will remain unchanged. - The proposal would not adversely disrupt any key landscape features of this LCZ.	Low - Direct views to the project where vegetative screening is minimal or absent are available in surrounding locations from approximately 500m or greater. - The proposal may generate a relatively small visual change within the landscape in select views, however the extent of this change is minor relative to the extent of this LCZ. - The proposal adjoins a small section of this LCZ.	Low

Table 3 Landscape character zone assessment

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06 Visual impacts

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6.1 Visual catchment and viewpoints

Prior to 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 viewshed analysis prepared by Urbis.

In November 2025, Urbis visited 12 locations during fieldwork in the project's areas, including photography, to review and confirm visibility.

Urbis selected three (3) 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 viewshed.

The landscape setting of the project is generally flat to slightly undulating with vegetation located along property boundaries, near dwellings with more extensive natural patterns of vegetation following water courses and within the Mologa Bushland Reserve to the east.

Within the landscape, overlooking is generally not possible from most identified viewpoints, and even relatively low vegetation located on surrounding properties (up to eye-height), is effective at screening views.

View opportunities located in the south and east, including two dwellings located near Yarrawalla East Road and Mitiamo-Kerang Road, were reviewed during fieldwork and it was determined that due to intervening vegetation creating blocking effects, receptor orientation, landform and distance, visual impacts would be highly constrained. We note that observations were made from publicly accessible locations only.

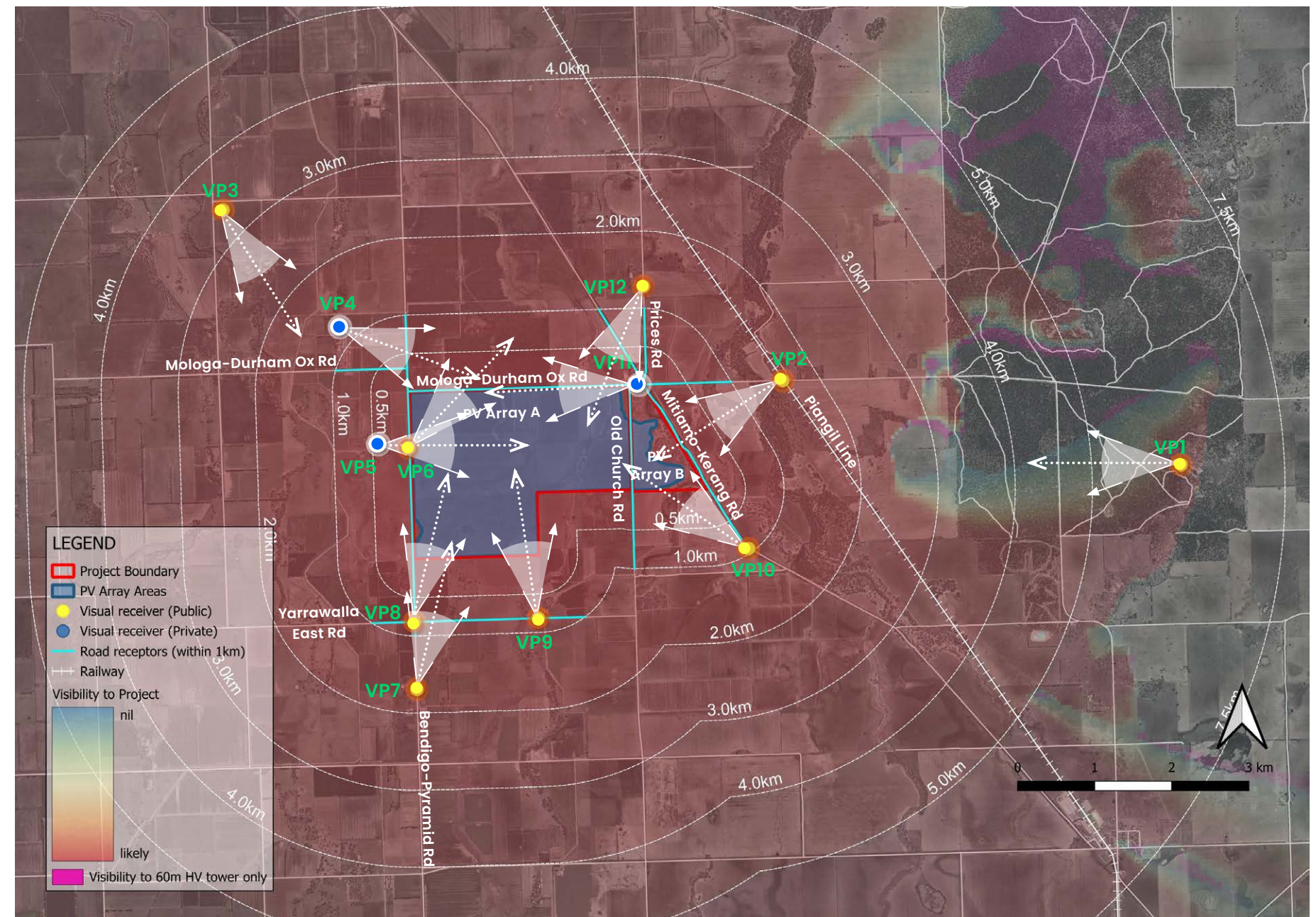


Figure 12 Viewshed (topography only) and viewpoint location map | Urbis

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6.2 Viewpoint selection

Three selected viewpoints were chosen for further analysis including one private and two public viewpoints. The selected locations are 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.

VIEWPOINT NUMBER	VIEWPOINT LOCATION
VP4	View south-east from front porch of a dwelling located at 7405 Bendigo Pyramid Road (northern associated receiver)
VP6	View north-east from access entry road to 7405 Bendigo Pyramid Road
VP11	View west from Mitiamo Kerang Road near private property at 5 Mologa Durham Ox Road

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Image 14 VP1 View west from Mt Terrick Terrick (8767)



Image 15 VP2 View SW from rail crossing at Durham Oxford Road (8784)



Image 16 VP3 View SE Central Mologa Rd at Durham Oxford Rd (8799)



Image 17 VP4 View SE from dwelling near Bendigo Pyramid Road (8832)



Image 18 VP5 View east, private road near Bendigo Pyramid Road (8905)



Image 19 VP6 View NE at 7405 Bendigo Pyramid Road drive entry (8818)

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Image 20 VP7 View NE, near 7089 Bendigo Pyramid Road (8917)



Image 21 VP8 View NE, Yarrawalla E and Bendigo Pyramid Road (8935)



Image 22 VP9 View north near 1107 Yarrawalla E Road (8959)



Image 23 VP10 View NW Mitiamo Kerang Road (8982)



Image 24 VP11 View west 5 Mitiamo Kerang Road (9047)



Image 25 VP12 View southwest near 135 Prices Road (9047)

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Viewpoint 4 (VP4)

7405 Bendigo Pyramid Road (northern dwelling)

Viewpoint type Rural dwelling
Distance to nearest site boundary 840m

View location and direction

Coordinates: 36°8'56"S 144°7'36"E

The view is south-east from a rural dwelling covered front porch. VP4 is located north-west of Mologa Durham and Bendigo Pyramid Road.

Description of existing view

The view consists of open pastoral land with minimal vegetation and built form. A pond is visible in the foreground, with a transmission line and tower across a flat landscape beyond. A dense vegetated buffer dominates the mid-ground, while low, vegetated hills of Terrick Terrick National Park form the background.

Visual effects of the proposed development

Construction

Effects from construction-related activity will be potentially visible including site works, such as stockpiling, set down areas as well as construction vehicles accessing the site from Bendigo-Pyramid Road. Visual effects however are located towards the background beyond the existing foreground vegetation buffer. Works would be temporary lasting from approximately 6 months to 1 year.

Operation

Visibility is limited to the north-east portion of the solar farm, appearing as a low, continuous horizontal form below middle and background vegetation. Key visual elements, including the open pastoral foreground, individual trees and the vegetated buffer remain visible and the development does not obstruct any identified or documented views.

Visual effects of proposed development during operation

Viewpoint sensitivity High
Scenic quality Low
Overall visual sensitivity Moderate
Magnitude rating Very-Low

Overall visual impact rating **Low**

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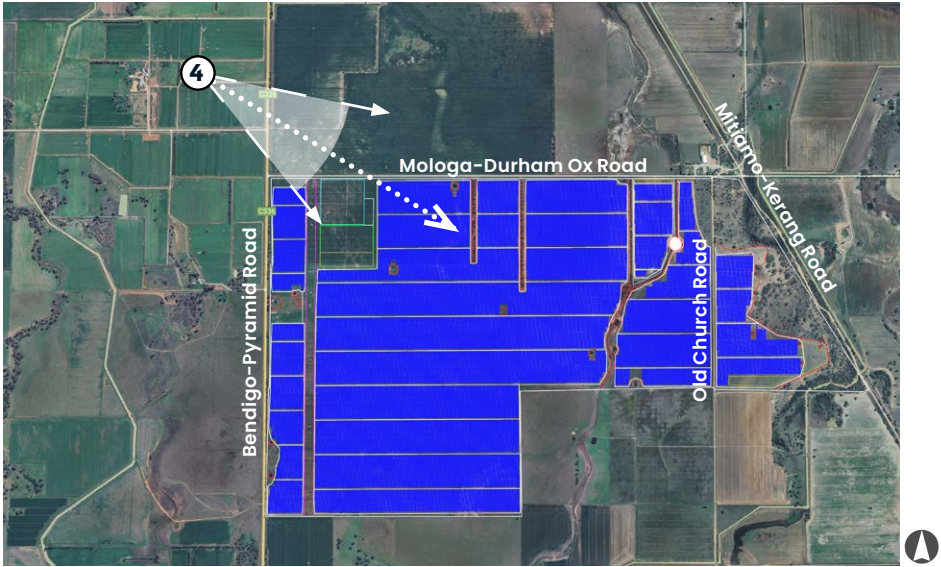


Figure 13 Viewpoint 4 location plan



Figure 14 Viewpoint 4 existing view

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Figure 15 Viewpoint 4 proposed unmitigated view - photomontage

Viewpoint 6 (VP6)

7405 Bendigo Pyramid Road (access driveway)

Viewpoint type Public road
Distance to nearest site boundary 25m

View location and direction

Coordinates: 36°9'43"S 144°7'53"E
View is north-east from a Bendigo-Pyramid Road (C336) at the entry drive access to the property at number 7405.

Description of existing view

The foreground consists of pasture grasses and Bendigo-Pyramid Road. This view is a landform view where the scenic quality is considered low as it includes large expanses of flat terrain and tower forms from power infrastructure. It is visually homogeneous characterised by indistinct, unbroken landforms that provide minimal spatial definition. Views from this location would be from moving viewing situations from vehicles.

Anticipated change to view

Construction

Visual effects from construction activity will be visible such as site works, fencing and construction vehicles accessing the site from Bendigo-Pyramid Road. Works would last approximately 1 year.

Operation

Visibility will comprise the north-west part of the solar farm and BESS switchyard compound and will be characterised by a low, continuous horizontal form (a novel feature) that sits above the mid and background vegetation. The majority of the key visual elements in the view such as the mid ground pastoral space is changed to incorporate the solar farm altering the intrinsic visual character of the view however the proposed development does not block any unique, identified or, documented, views. An existing HV tower is replaced with a larger HV tower form and gantry, however these are not novel features in the overall composition that currently includes tower form infrastructure.

We note that visibility from a dwelling located immediately west was reviewed as part of the fieldwork however visibility of the subject site was blocked by intervening vegetation and setback from the road.

Visual effects of proposed development during operation

Viewpoint sensitivity Low
Scenic quality Low
Overall visual sensitivity Low
Magnitude rating Moderate

Overall visual impact rating	Low
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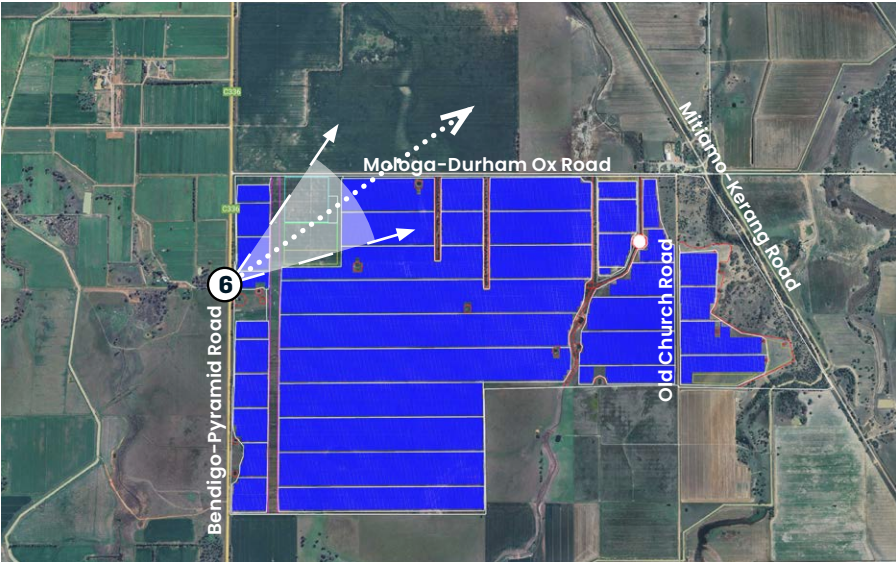


Figure 16 Viewpoint 6 location

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Figure 17 Viewpoint 6 existing view

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Figure 18 Viewpoint 6 proposed unmitigated view with replacement HV tower photomontage

Viewpoint 11 (VP11)

5 Mologa–Durham Ox Road

Viewpoint type	Rural dwelling
Distance to nearest site boundary	160m

View location and direction

Coordinates: 36°9'19"S 144°9'49"E

View is east from a driveway access to a property at 5 Mitiamo Kerang Road. The VP is located just east of the junction with Old Church Road and approximately 75m west of the associated rural dwelling.

Description of existing view

The foreground comprises of pasture grasses and a local access road partially lined by native trees near Old Church Road. This view is a landform view where the scenic quality is considered low as it includes large expanses of flat terrain. It is visually homogeneous characterised by indistinct, unbroken landforms that provide minimal spatial definition. The site does not include landmarks or visual markers to orient the viewer and views from this location would be from moving viewing situations from vehicles.

Anticipated change to view

Construction

Effects from construction activities will potentially be visible such as site works from stockpiling and fencing as well as construction vehicles along Mologa–Durham Oxford Road located towards the mid ground beyond the foreground trees. Works would be temporary lasting from approximately 6 months to 1 year.

Operation

Visibility includes the north-east corner of the solar farm, appearing as a low, continuous horizontal form above mid and background vegetation. The development alters the mid-ground pastoral character but does not obstruct any identified or documented views. Visibility from a dwelling to the west is partly screened by intervening vegetation and road setback. The BESS, Switchyard and Terminal Station are blocked by foreground vegetation and solar panels from this viewpoint.

Visual effects of proposed development during operation

Viewpoint sensitivity	Low
Scenic quality	Low
Overall visual sensitivity	Low
Magnitude rating	Moderate

Overall visual impact rating	Low
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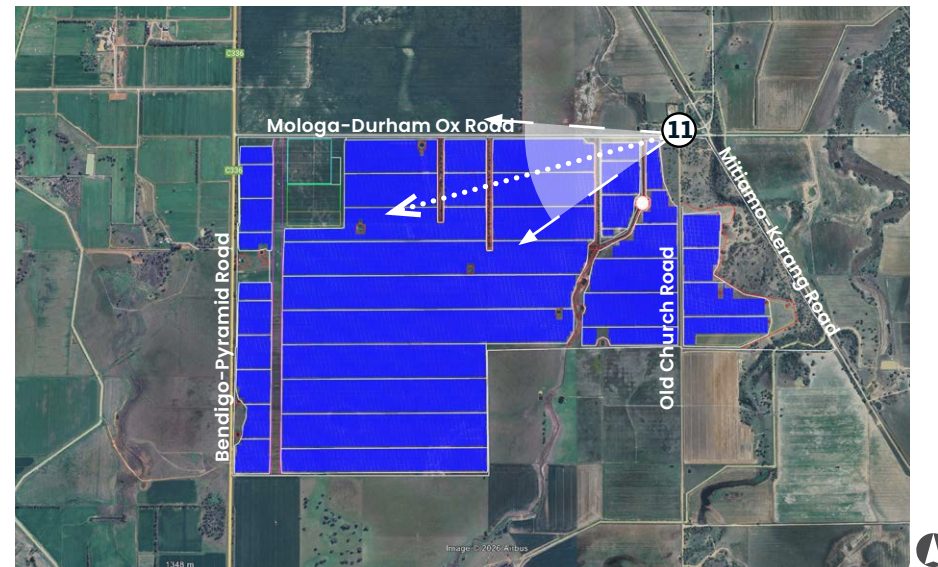


Figure 19 Viewpoint 11 location



Figure 20 Viewpoint 11 existing view

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Figure 21 Viewpoint 11 proposed unmitigated view - photomontage

07 Glint and glare

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7.1 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) are 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 difference between glint and glare is duration, with glint being more likely under a dynamic scenario, eg. a momentary sun reflection off a passing vehicle's windscreen on a sunny day, as compared with glare, which is more likely under a static scenario, eg standing by a lake and observing the sun's reflection off the water surface. Where there is glare observed from a stationary observer, glint may be observed by a moving observer passing by the same position. The modelling prepared in this assessment therefore accounts for both glint and glare.

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 22. 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 31) 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 a second solar farm (North Airfield Solar Farm – completed late-2024) located about 700m from the north-south runway.

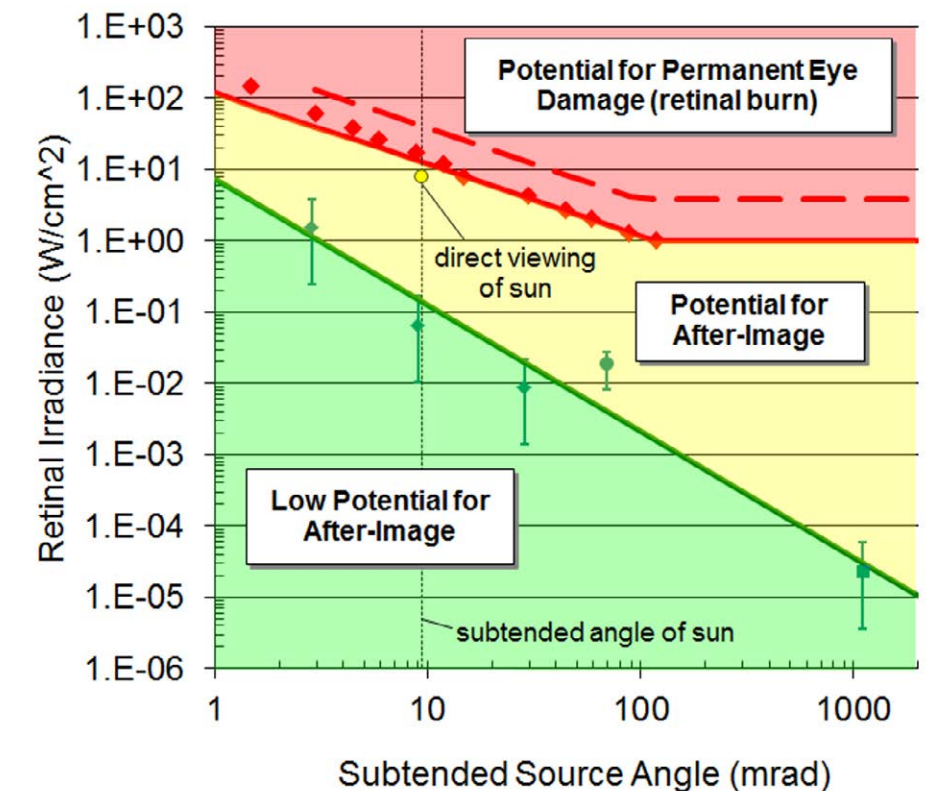


Figure 22 Glare hazard plot defining ocular impact (Ho et al, 2011)

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7.2 PV Array Areas

The project footprint comprises two proposed PV array areas, representing the combined area proposed to contain solar panels. Coordinates for these have been derived from the supplied CAD layout plans which contain geo-coordinates. Refer to Table 4 and Figure 23.

Solar panels with a maximum height of 4.0m are being considered, with a lower maximum of up to 2.827m, based on tracker provider dimensions. Refer to Figures 24 and 25. Maximum heights of panels are when panels are at their maximum tilt of 60°.

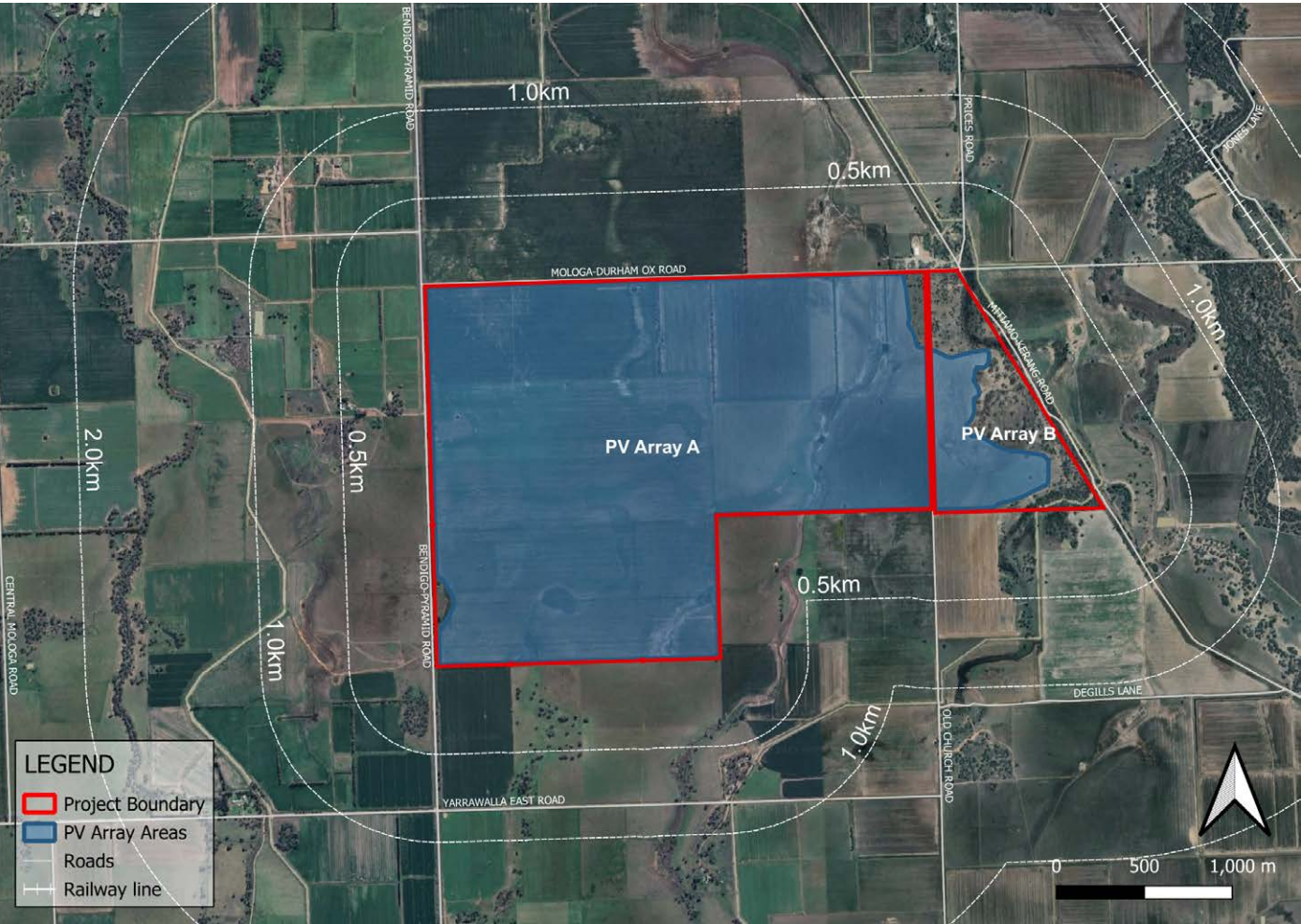


Figure 23 Project PV Array areas plan

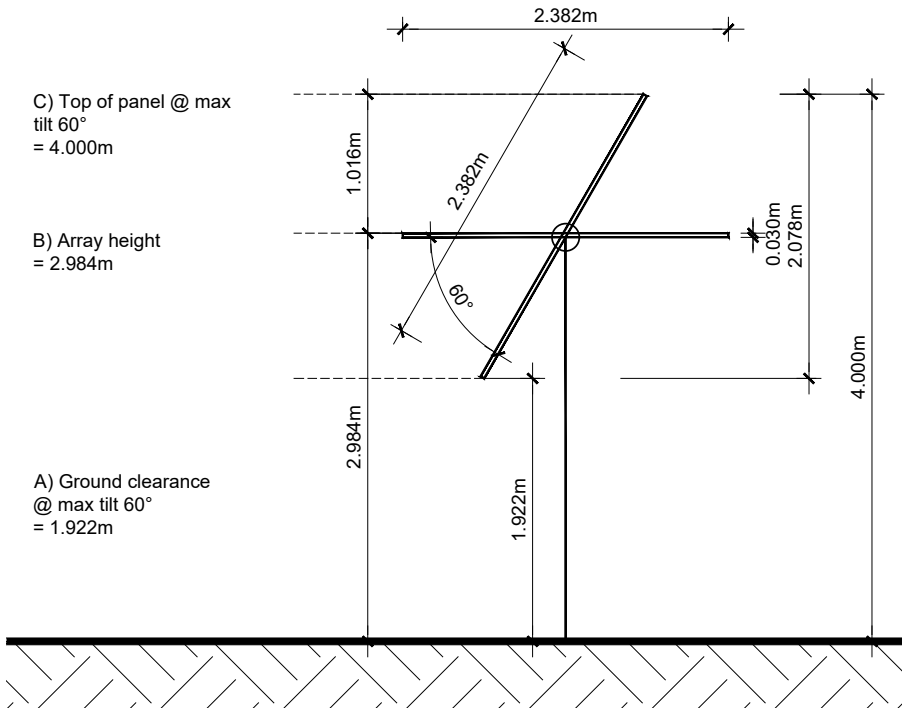


Figure 24 Single-axis tracker - typical elevation (at maximum 4.0m)

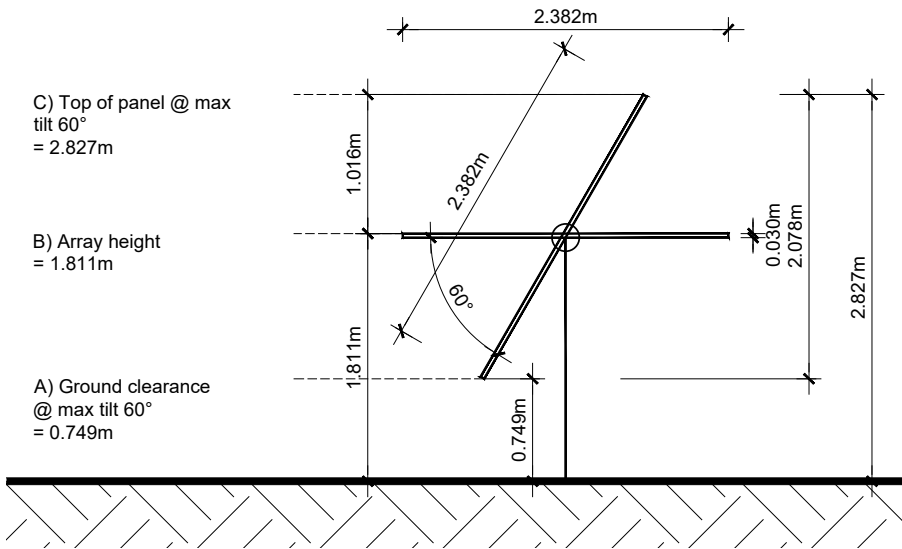


Figure 25 Single-axis tracker - typical elevation (lower maximum, based on tracker provided dimensions)

PV Areas ID	PV Areas details
PV Array A	Project Site West
PV Array B	Project Site East

Table 4 Project PV Array areas

7.3 Receptors

As outlined in DELWP's Solar Energy Facilities: Design and Development Guideline (October 2022), glare impacts are to be assessed for dwellings and roads within 1km of the proposed facility. Refer to Table 5 and Figure 26.

The Project will also be assessed for potential glare towards the nearest aviation facilities, as follows:

- Pyramid Hill aerodrome is approximately 10 kilometres north of the Project, which consists of one runway running north-south.

The aerodrome contains one runway, containing two approach-paths at either end and are individually identified with Receptor IDs FP1-FP2. There are no aircraft traffic control towers (ATCTs).

A total of 14 receptors have been identified are assessed.

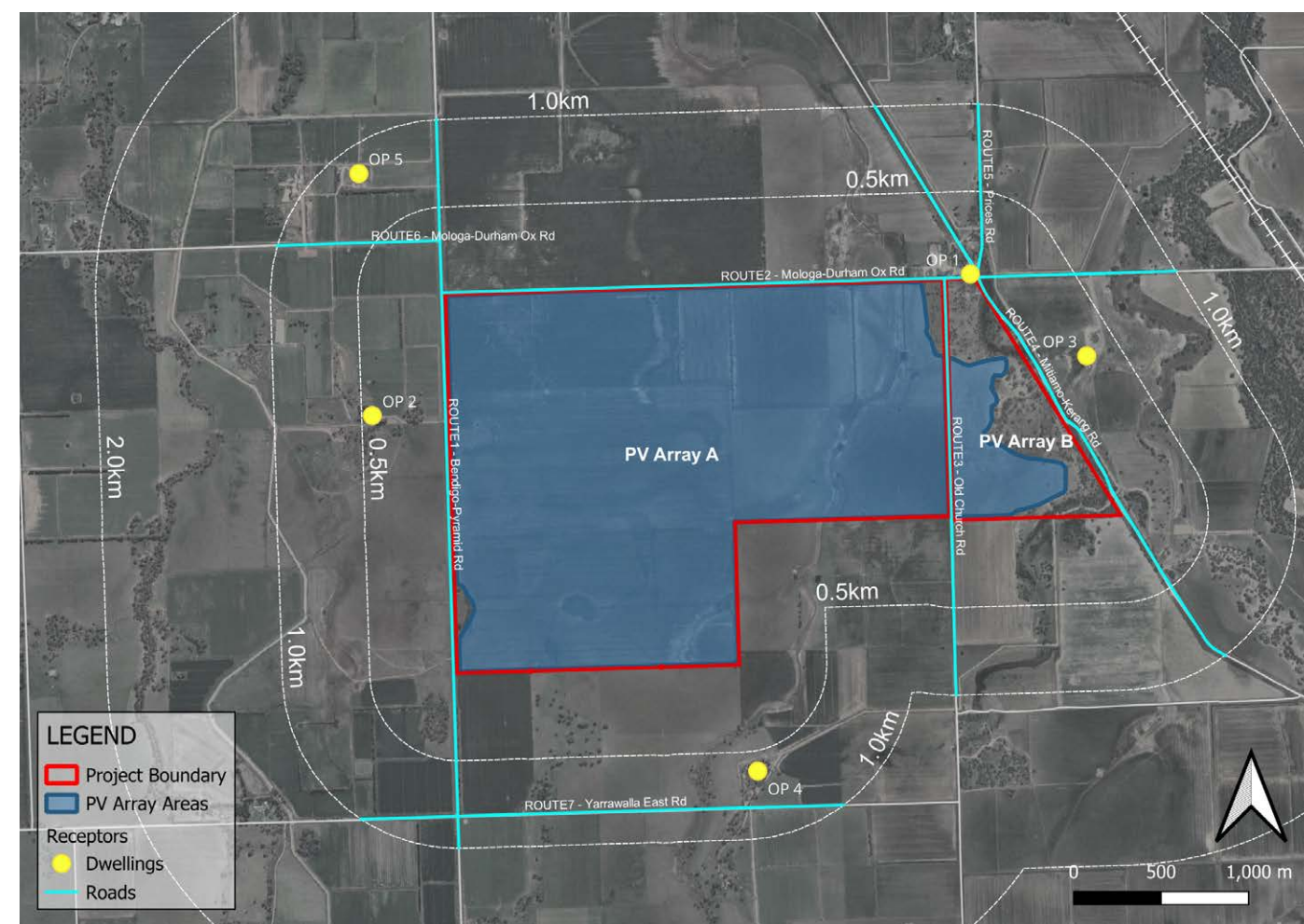


Figure 26 Project components, receptors and routes

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7.4 Viewshed analysis

The location of the Project site is situated on relatively flat terrain, with a number of sensitive receptors located around the Project site. There is therefore potential for direct visibility towards the Project from some sensitive receptors where there may not be any existing vegetation screening views.

The viewshed analysis prepared in Figure 12 identifies ground-level receptors that may be visible (have line-of-sight) to the project and therefore potentially impacted by glint and glare. A viewshed analysis determines visibility based upon a worst-case scenario, which only considers topography. It does not consider any intervening vegetation or structures that may exist.

Of the 12 sensitive ground-level receptors identified, the viewshed analysis shows that all will have potential visibility to the Project. A total of 5 dwellings and 7 roads have been identified with visibility to the Project.

Airport receptors have not been included as a ground-level receptor given their distance from the Project, however, they will still be assessed for glint and glare along their approach paths.

Receptor ID	Receptor Type	Receptor details	Distance to Project (nearest PV Array)	Nearest PV Array	Visibility to Project (viewshed)
FP1	aerodrome	Pyramid Hill 00	9.77km	A	n/a
FP2	aerodrome	Pyramid Hill 18	11.08km	A	n/a
OP1	dwelling	5 Mitiamo-Kerang Road, Mologa	280m	B	yes
OP2	dwelling	7405 Bendigo-Pyramid Road, Mologa	450m	B	yes
OP3	dwelling	2518 Mologa-Durham Ox Road, Mologa	450m	A	yes
OP4	dwelling	1107 Yarrowalla East Road, Mitiamo	630m	B	yes
OP5	dwelling	7541 Bendigo-Pyramid Road, Mologa	860m	A	yes
Route 1	road	Bendigo-Pyramid Rd	30m	A	yes
Route 2	road	Mologa-Durham Ox Rd	10m	A & B	yes
Route 3	road	Old Church Rd	10m	A & B	yes
Route 4	road	Mitiamo-Kerang Rd	130m	B	yes
Route 5	road	Prices Rd	320m	B	yes
Route 6	road	Mologa-Durham Ox Rd	310m	A	yes
Route 7	road	Yarrowalla East Rd	820m	A	yes

Table 5 Project receptors and routes

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7.5 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 6.

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	mrاد	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	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°,3°,4°,5°,15°,30°,45°,60°)
Ground Coverage Ratio (GCR)	0.340	-	Ratio between panel area and ground area
Material & Power			
Module surface material	Smooth glass with ARC	type	Proposed PV Panel : 2.382m length - information as supplied
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

Table 6 Modelling input parameters.

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Parameter	Value	Units	Comment
Receptors			
View angle	50°	deg	Default (unchanged)
PV Array height	1.811m and 2.984m	m	Refer to provided elevations. Assessed for: - Panel height up to 4m (2.984m PV Array height) - Maximum dimensions from tracker provider, up to 2.827m (1.811m PV Array height)
Standing height at Observation Points (OPs)	1.5	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)

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To more accurately define the project's two PV areas within the model, coordinates that define PV Arrays A-B 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 digital elevation model (DEM) 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/rail routes, dwellings and airports (where applicable) have also been prepared in the same way.

7.6 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.

To address some of these known limitations, several methods have been used to more accurately model the Project scenario, including:

- Use of viewshed analysis to identify visibility to the project, taking into account topography.
- Project site has been divided into smaller areas to increase accuracy of levels being assessed.
- Local Australian Height Datum (AHD) levels used to define the Project ground levels, rather than levels derived from Google Maps (software default).

7.7 Resting Angles

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 are analysed.

Single-axis tracking systems are designed such that the tilting panels typically track the sun, ensuring the panel surfaces remain mostly perpendicular to the angle of the sun. Therefore, glare or glint impacts on surrounding areas are unlikely during the day. However, if glare is predicted, occurrences are more likely to be during morning or evening, when the sun is low in the sky.

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.

A resting angle of 0° (solar panel is horizontal) is often found to result in the highest amount of glare at times of day when the sun is lower in the sky, similar to glare from a waterbody at sunset.

7.8 Results and summary

A total of nine (9) scenarios based on resting angle were simulated covering the full range of resting angle configurations 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°-3°, some glare is predicted towards some receptors from the PV Arrays. The amount of glare predicted decreases as the resting angle is increased, with the modelling showing that scenarios ranging from a resting angle of 4°-60° (inclusive) resulted in no predicted glare to any assessed receptors, from the two PV Arrays. Refer to Table 7.

For detailed results, the report outputs from the ForgeSolar's GlareGauge software is provided as Appendix 2.

Resting Angle 0° – Worst-case scenario

Under this scenario, the greatest amount of glare is predicted across the project, with:

- Glare predicted from all two PV Array areas.
- 6 out of 14 receptors predicted with any glare (green or yellow)
 - 4 ground-level receptors (green and yellow)
 - 2 ground-level receptors (green glare only)
- Green glare predicted for 6 receptors
- Of the 6 receptors predicted with green glare, 4 receptors also predicted with yellow glare
- No glare predicted to any aerodrome receptors.

Predicted Glare window (all predicted green and yellow glare):

- Duration of up to 19 mins daily
- All year round (January to December)
- Between ~5:00am-8:00am AEST (morning) and between ~4:55pm-7:50pm AEST (evening).

Resting Angle 3°

When the resting angle is increased, there is a significant reduction in total glare predicted across the project, with:

- Glare predicted from PV Array A only (green and yellow glare)
- Predicted number of glare receptors dropping to 1 out of 14
- Predicted glare from ground receptors only:
 - Route 2 – Mologa-Durham Ox Rd (green and yellow glare)
- No glare predicted to any aerodrome receptors.

Predicted Glare window (all predicted green and yellow glare):

- Duration of up to 13 mins daily
- Between early-November to early-February (~3 months)
- Between ~5:00am-5:55am AEST (morning) and between ~6:50pm-7:50pm AEST (evening).

Resting Angle 4-60° (inclusive) – Range with no glare impacts

Resting angles at between 4-60° (inclusive) results in the scenarios which eliminate all predicted glare across the project, from all assessed receptors. Refer to Table 7 and Table 8.

Summary of findings as follows:

- No receptors with predicted glare.
 - No ground level receptors with predicted glare.
 - No aerodrome receptors with predicted glare.
- No mitigation measures required as there is no predicted glare.

Predicted Glare window (all predicted green and yellow glare):

- Nil

Resting Angle	Up to maximum 2.827m height (at max tilt 60°)			
	PV Array A		PV Array B	
	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)
	Total (all receptors)	Total (all receptors)	Total (all receptors)	Total (all receptors)
0 degrees	595	2549	410	432
3 degrees	108	706	0	0
4 degrees	0	0	0	0
5 degrees	0	0	0	0
15 degrees	0	0	0	0
30 degrees	0	0	0	0
45 degrees	0	0	0	0
60 degrees	0	0	0	0

Table 7 Summary of results: Total predicted glare, by resting angle

	Up to maximum 4.000m height (at max tilt 60°)			
	PV Array A		PV Array B	
	Green Glare (min/year)	Yellow Glare (min/year)	Green Glare (min/year)	Yellow Glare (min/year)
	Total (all receptors)	Total (all receptors)	Total (all receptors)	Total (all receptors)
	209	658	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0

7.9 Recommendations

We recommend that the Resting Angle for the project is configured to between 4° 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. 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, such as vegetation screening, are not required.

Receptor ID	Receptor Type	Receptor details	Green Glare	Yellow Glare	Green Glare	Yellow Glare	Green Glare	Yellow Glare
			Predicted glare from any PV Array					
			Resting Angle 0°	Resting Angle 3°	Resting Angle 4-60°			
FP1	aerodrome	Pyramid Hill 00	no	no	no	no	no	no
FP2	aerodrome	Pyramid Hill 18	no	no	no	no	no	no
OP1	dwelling	5 Mitiamo-Kerang Road, Mologa	yes	yes	no	no	no	no
OP2	dwelling	7405 Bendigo-Pyramid Road, Mologa	no	no	no	no	no	no
OP3	dwelling	2518 Mologa-Durham Ox Road, Mologa	yes	no	no	no	no	no
OP4	dwelling	1107 Yarrawalla East Road, Mitiamo	no	no	no	no	no	no
OP5	dwelling	7541 Bendigo-Pyramid Road, Mologa	no	no	no	no	no	no
Route 1	road	Bendigo-Pyramid Rd	no	no	no	no	no	no
Route 2	road	Mologa-Durham Ox Rd	yes	yes	yes	yes	no	no
Route 3	road	Old Church Rd	no	no	no	no	no	no
Route 4	road	Mitiamo-Kerang Rd	yes	yes	no	no	no	no
Route 5	road	Prices Rd	yes	yes	no	no	no	no
Route 6	road	Mologa-Durham Ox Rd	no	no	no	no	no	no
Route 7	road	Yarrawalla East Rd	yes	no	no	no	no	no

Table 8 Summary of results: Total predicted glare to receptor, by resting angle

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08 Mitigation

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8.1 Required mitigation

Mitigation 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.

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.

The level of visual impact has been assessed against the Visual Performance Objectives outlined in Section 3 of the DPE Technical Supplement, which determines the need, level and type of visual mitigation.

8.2 Perimeter planting

Visual impact ratings for the assessed public and private viewpoints were found to be Low, however mitigative planting is recommended to screen the proposal to address the Moderate-Low landscape character assessment ratings. It is therefore recommended that continuous screening be implemented to the boundaries to better integrate the project with the landscape context.

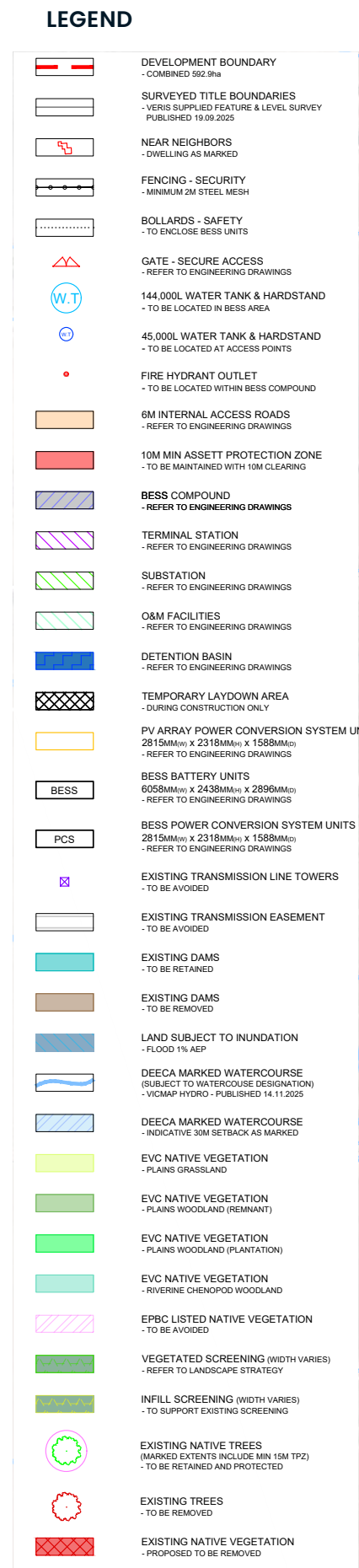
The Project includes a 2m high steel mesh security fence installed around the solar panel areas. A 10m wide landscape buffer has been allowed to provide screening to the western boundary while a 5m wide landscape buffer has been allowed to the northern, southern and part of the eastern boundaries.

Continuous boundary planting includes “Vegetated Screening” or “Infill Screening”, please also refer separate landscape planting plans 202-F1, F2 and F3 and landscape strategy prepared by Urbis. Photomontages have been prepared from the three assessed viewpoints that are the closest and potentially most affected locations and include the proposed planting indicatively at a 5-year development period.

The low-profile form of the majority of the Project, primarily the solar array, will help ensure that the planting can establish enough to provide screening within 5 years.

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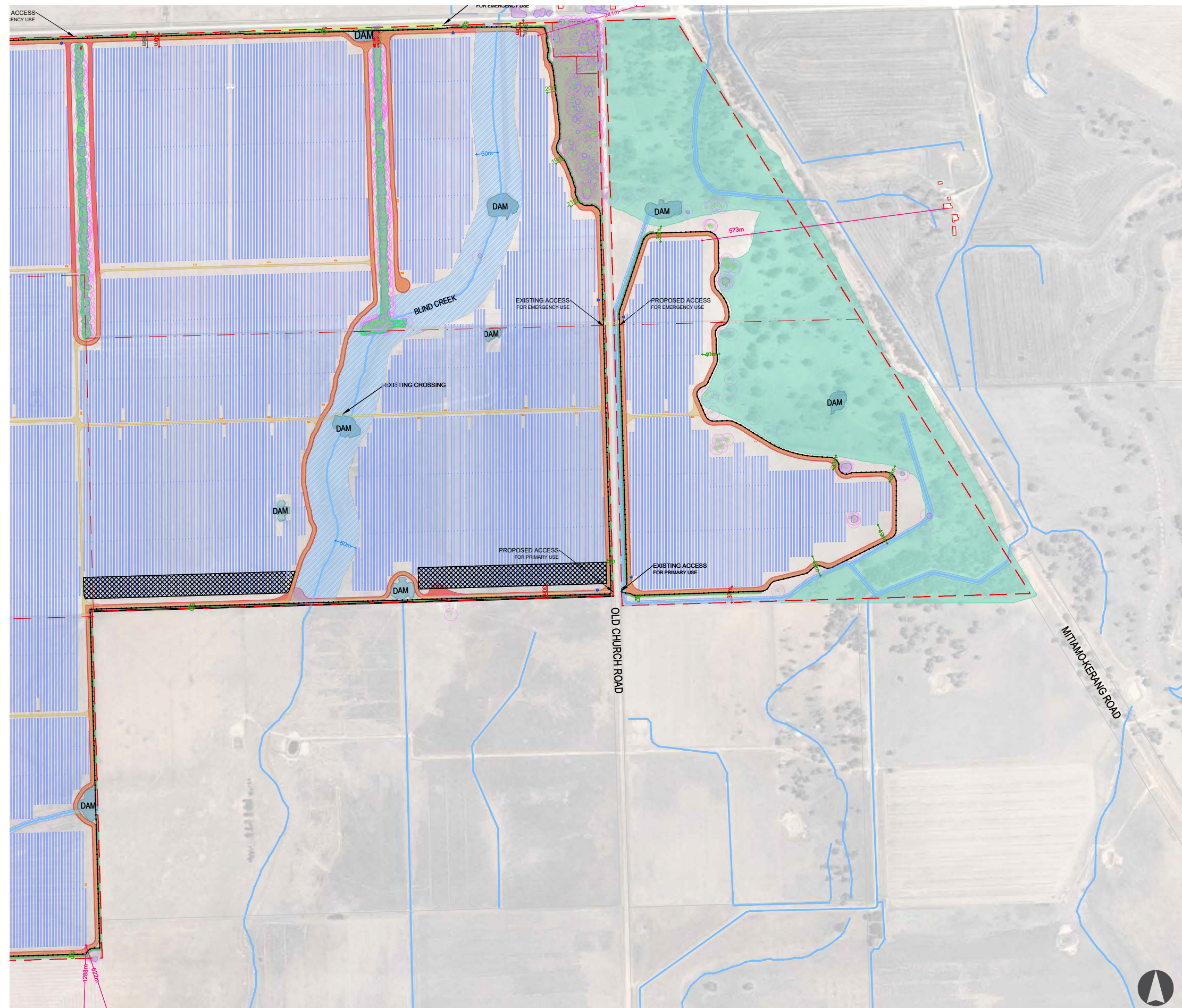


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Figure 27 Landscape planting strategy western site area | Urbis



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Figure 28 Landscape planting strategy eastern site area | Urbis

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8.0: Mitigation



Figure 29 VP4 - Landscape Proposal at 5 years

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Figure 30 VP6 - Landscape Proposal at 5 years

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8.0: Mitigation



Figure 31 VP11 - Landscape Proposal at 5 years

8.3 Lighting impacts

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 that 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, would be limited wherever possible.

Proposed lighting associated with the project will be in accordance with Australian standard AS/NZS 4282:2023, which provides guidelines to limit light spill, glare, and skyglow from outdoor lighting on nearby properties, road users, and the environment. The standard sets mandatory maximum light technical parameters (illuminance, intensity) based on environmental zones, commonly enforced by councils in Development Control Plans.

8.4 Visual absorption capacity

The existing visual environment and landscape setting generally has a high capacity to physically and visually absorb the proposal due to the low and linear nature of the proposal across a low landscape form. Opportunities to overlook the project are limited to isolated undulations, where views from close or adjacent areas, would take in immediate foreground forms rather than any extended expanse proposed.

Viewing opportunities from more elevated locations for example from Mt Terrick Terrick are distant, where the form, line or extent of the proposal would be difficult to discern or identify in the context of midground and distant flat topography and dark tones of vegetation that characterise the compositions.

The project is visually absorbed by the existing visual environment to an extent that the fundamental landscape character of the wider visual context, and sub-regional visual character area will remain unchanged and unaffected by the proposal.

8.5 Residual impacts

The effectiveness of the measures proposed in mitigating the landscape and visual impacts resulting from the Project is demonstrated by comparing the visual impact during initial operation with the residual impact when the proposed landscape measures have mostly matured, typically from about five (5) to ten (10) years following initial planting.

Generally, residual impacts would reduce ratings by at least one level where landscape measures have been implemented and matured due to filtering or inhibiting views to the Project.

Residual impacts are low and acceptable given the PAC of the surrounding landscape, the visual compatibility of proposed mitigative screening with existing native vegetation species once the plantings successfully establish after approximately 5 years.

The proposal therefore does not create any significant adverse effects on the wider landscape character of this part of Central-Northern Victoria.

8.6 Cumulative impacts

Cumulative impacts are defined in the NSW Government's *Cumulative Impact Assessment Guidelines for State Significant Projects* as the "result of incremental, sustained and combined effects of human action," caused by the "compounding effects of a single project or multiple projects in an area, and by the accumulation of effects from past, current and future activities as they arise" (Department of Planning and Environment, 2022).

A review was undertaken to determine if the Project would contribute to cumulative impacts on landscape character and visual amenity in the context of other nearby existing and approved infrastructure and renewable projects. From the review, there were no other projects identified within the immediate context.

As part of the 2025 Victorian Transmission Plan, the Victorian Government is proposing 7 draft proposed renewable energy zones (REZ) throughout Victoria. The North West REZ is the nearest REZ to the Project however is more than 25km away at its closest point. Considering the distance of this project and the REZ, it is concluded that there are no cumulative impacts resulting from the Project.

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09 Conclusion

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9.1 Landscape character summary

The assessment of impacts to landscape character from the project assessed how the development would affect the elements that make up the landscape, including the aesthetic and perceptual aspects of the landscape and its distinctive characteristics.

The existing visual environment and landscape setting generally has a high capacity to physically and visually absorb the proposal due to the low and linear nature of the proposal across a flat landscape form.

Three (3) LCZs were identified within the study area and assessed in the landscape character assessment

- LCZ1 – Agricultural Plains
- LCZ2 – Cypress Pine Woodland
- LCZ 3 – Creek Corridor

LCZ1 and LCZ2 were assessed as Moderate-Low landscape character impact ratings due primarily to Moderate sensitivity attributed to unique landscape features that characterise the LCZs.

LCZ3 was rated as a Low impact rating as it does not have unique features and can tolerate the changes introduced as part of the proposal.

Proposed mitigation boundary screen planting would likely reduce all impacts on landscape character over time.

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9.2 Visual impact summary

When all relevant data is considered including fieldwork observations, analysis of high-resolution single frame images and photomontages in the context of the underlying landform, view places and existing vegetation patterns, the visual effects of the proposed development are constrained to a small geographic area.

Three viewpoints, two public roads and one (1) private dwelling, were selected for assessment due to their proximity and potential visibility. Although VP11 is assessed from Mologa-Durham Ox Road, the location is near an existing dwelling and is representative of view impacts at this location. The VIA concluded;

- Low impacts were found for all VPs from the modelled views due to either Low or Very Low Magnitude or Low Sensitivity ratings of the unmitigated proposal.
- A taller transmission tower form will replace an existing tower form in north-easterly views from Bendigo-Pyramid Road however the tower is not a new or novel feature in the view composition that includes other transmission towers.
- Visual effects of vegetative screening would reduce visibility of the proposal over time likely creating very-low residual impacts for all VP locations.
- Visibility from the south and east is highly constrained due to intervening vegetation, landform and distance to potential receptors. Although impacts are anticipated to be low to negligible, a vegetation buffer is proposed along the project boundaries that will further reduce impacts over time.
- There are limited viewing opportunities to the BESS facility given its location and relative visual isolation within the site.
- The level and duration of required lighting combined with physical distance between visual receivers and the project is unlikely to generate any significant adverse lighting effects or impacts during construction or operation.
- Effects from construction-related activity are potentially visible such as site works and construction vehicles accessing the site from Bendigo-Pyramid Road but are anticipated to be temporary, ie a period of approximately one (1) year.
- Based on the proposed layout and the recommended resting angles, we anticipate no glare impacts for the project for all assessed receptors within 1km.

The overall impacts are considered to be low and acceptable and the project can be supported on visual impact grounds.

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Appendices

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Appendix A: Photomontages

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Mologa Solar Farm, Mologa VIC

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Appendix A
Visual Assessment | Photomontages

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Photomontages Prepared By:

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

Date Prepared:

22 April 2026

Visualisation Artist:

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

Kim Nguyen, Urbis – Visual Technologies Consultant
Bachelor of Interior Architecture

Location Photographer:

Kris Petersen, Urbis – Landscape and Visual Impact, Senior Consultant

Camera:

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

Camera Lens and Type:

Canon EF24-105mm f/3.5-5.6 IS STM

Software Used:

- 3DSMax 2023 with Arnold 5 (3D Modelling and Render Engine)
- AutoCAD 2025 (2D CAD Editing)
- Globalmapper 26 (GIS Data Mapping / Processing)
- Photoshop CC 2025 (Photo Editing)

Data Sources:

- Digital Elevation Models from Vicmap datasets (DEM) – 2020-10
- Independent site survey from Veris Australia – Registered Surveyors (AutoCAD DWG, DTM, Contours,)
– Dated 2025-09-19
- Independent site survey LiDAR point cloud dataset from Veris Australia – Registered Surveyors (LiDAR LAZ files)
– Dated 2025-09-19
- Aerial photography (site) from Veris Australia (geo-referenced ECW & JPG) – 2025-09-19
- Aerial photography (wider context) from Nearmap (geo-referenced JPG) – 2020-01-12
- Proposed layout plan drawings received from Urbis (AutoCAD DWG and PDF) – Dated 2026-03-03

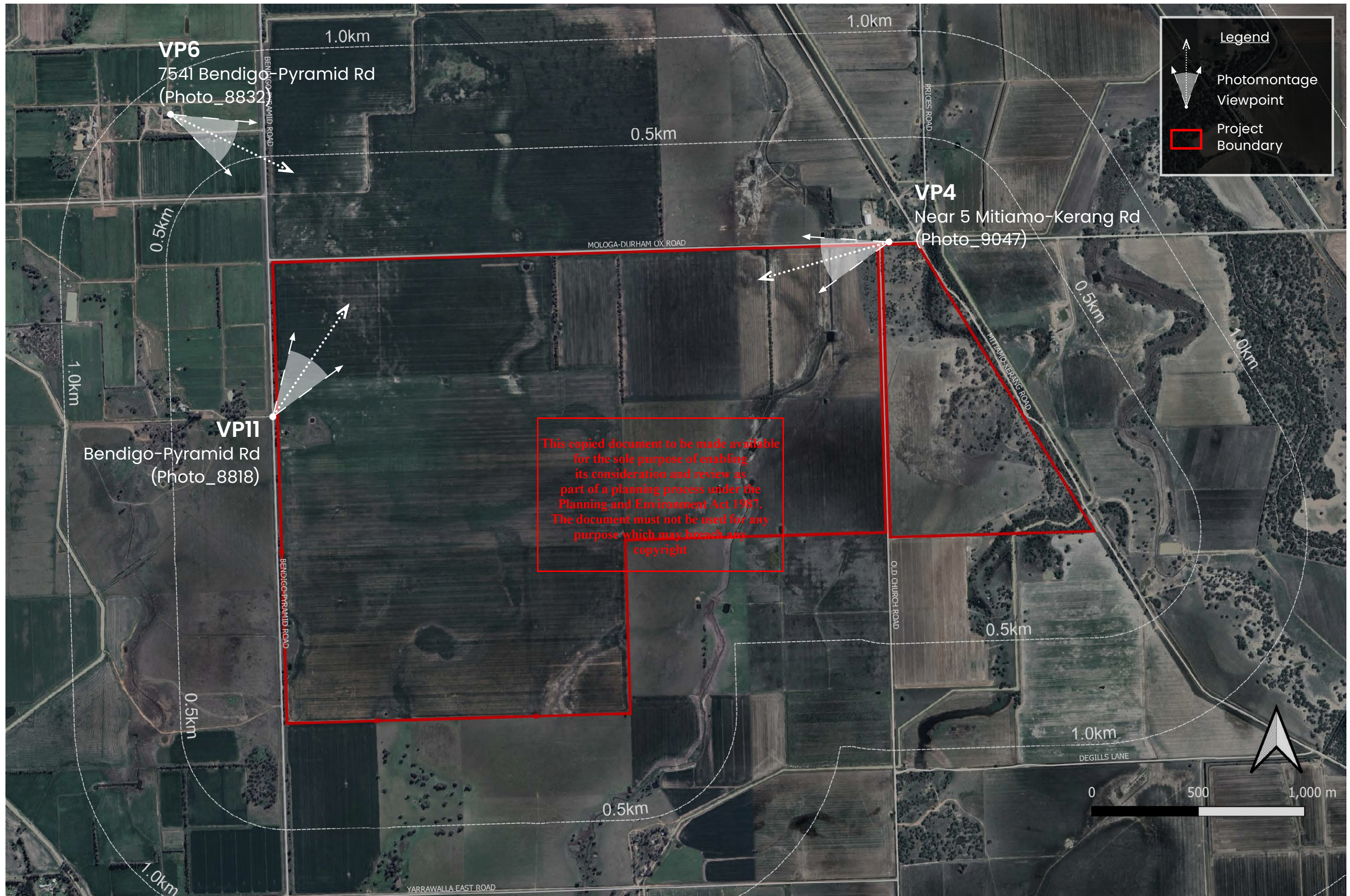
Methodology :

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 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, LiDAR point cloud datasets, 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, LiDAR point cloud, 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.

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Original Photo Extent - 50mm Standard View



Mologa Solar Farm, Mologa VIC - Visual Assessment

VP4 (Photo 9047): Near 5 Mitiamo-Kerang Road, looking WSW along Mologa-Durham Ox Road
Existing Conditions 2025-11-13 14:13 AEDT

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DATE: 2026-04-22
JOB NO: P0058365
DWG NO: VP_4A
REV: -



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LiDAR point cloud
model matched to
photograph

Original Photo Extent - 50mm Standard View



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Proposed HV Tower (60m max)
and gantries (24.3m max)
- screened behind existing
vegetation



Distance to Project - 160m
Original Photo Extent - 50mm Standard View



Mologa Solar Farm, Mologa VIC - Visual Assessment

VP4 (Photo 9047): Near 5 Mitiamo-Kerang Road, looking WSW along Mologa-Durham Ox Road
Photomontage - Proposed Development

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PLAN**

DATE: 2026-04-22
JOB NO: P0058365
DWG NO: VP_4C
REV: -

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Proposed HV Tower (60m max)
and gantries (24.3m max)
- screened behind existing
vegetation



Distance to Project - 160m
Original Photo Extent - 50mm Standard View



Mologa Solar Farm, Mologa VIC - Visual Assessment

VP4 (Photo 9047): Near 5 Mitiamo-Kerang Road, looking WSW along Mologa-Durham Ox Road
Photomontage - Proposed Development with Landscaping at 5 Years Growth

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DATE: 2026-04-22
JOB NO: P0058365
DWG NO: VP_4D
REV: -



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Original Photo Extent - 50mm Standard View





Original Photo Extent - 50mm Standard View

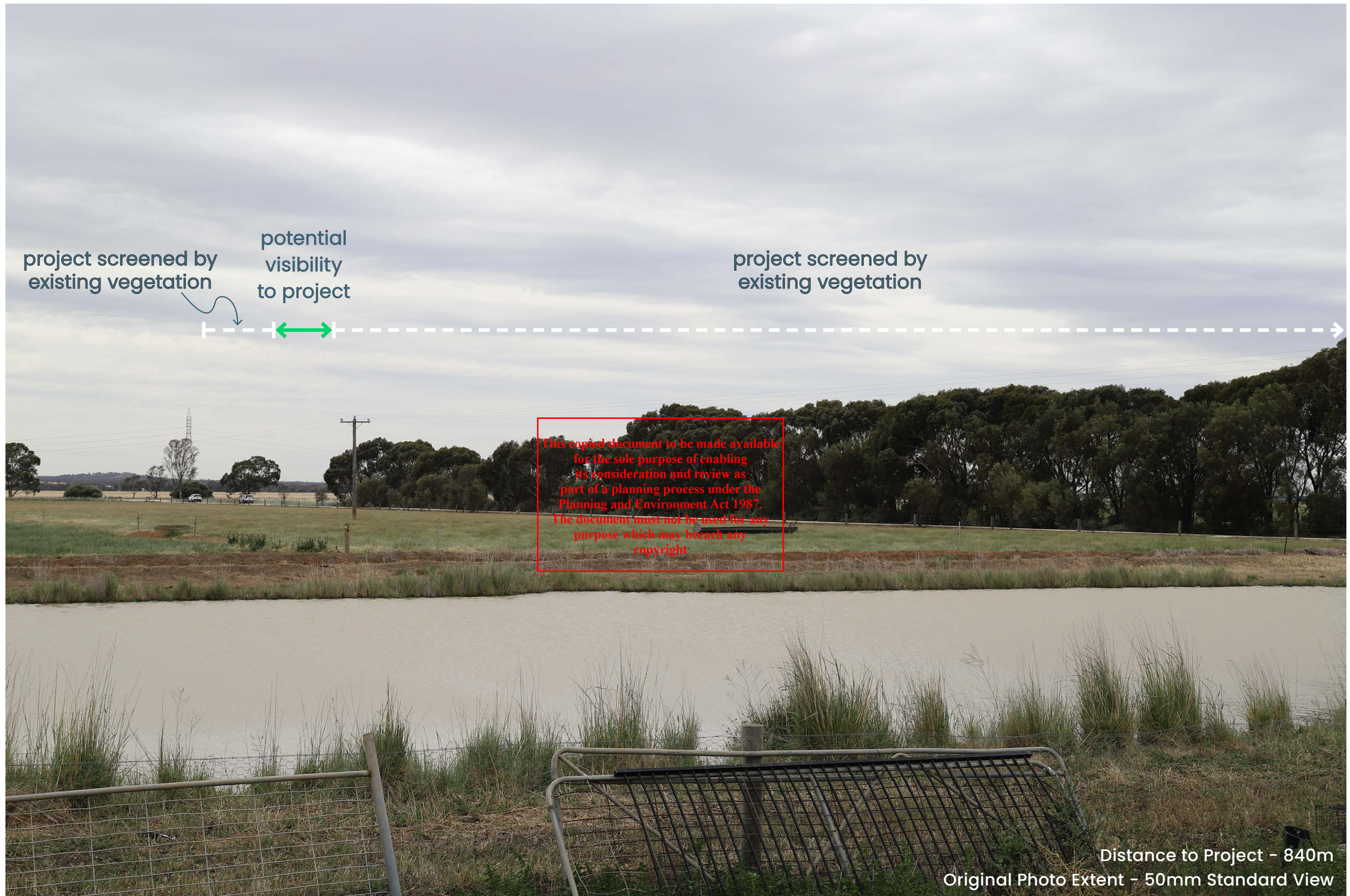


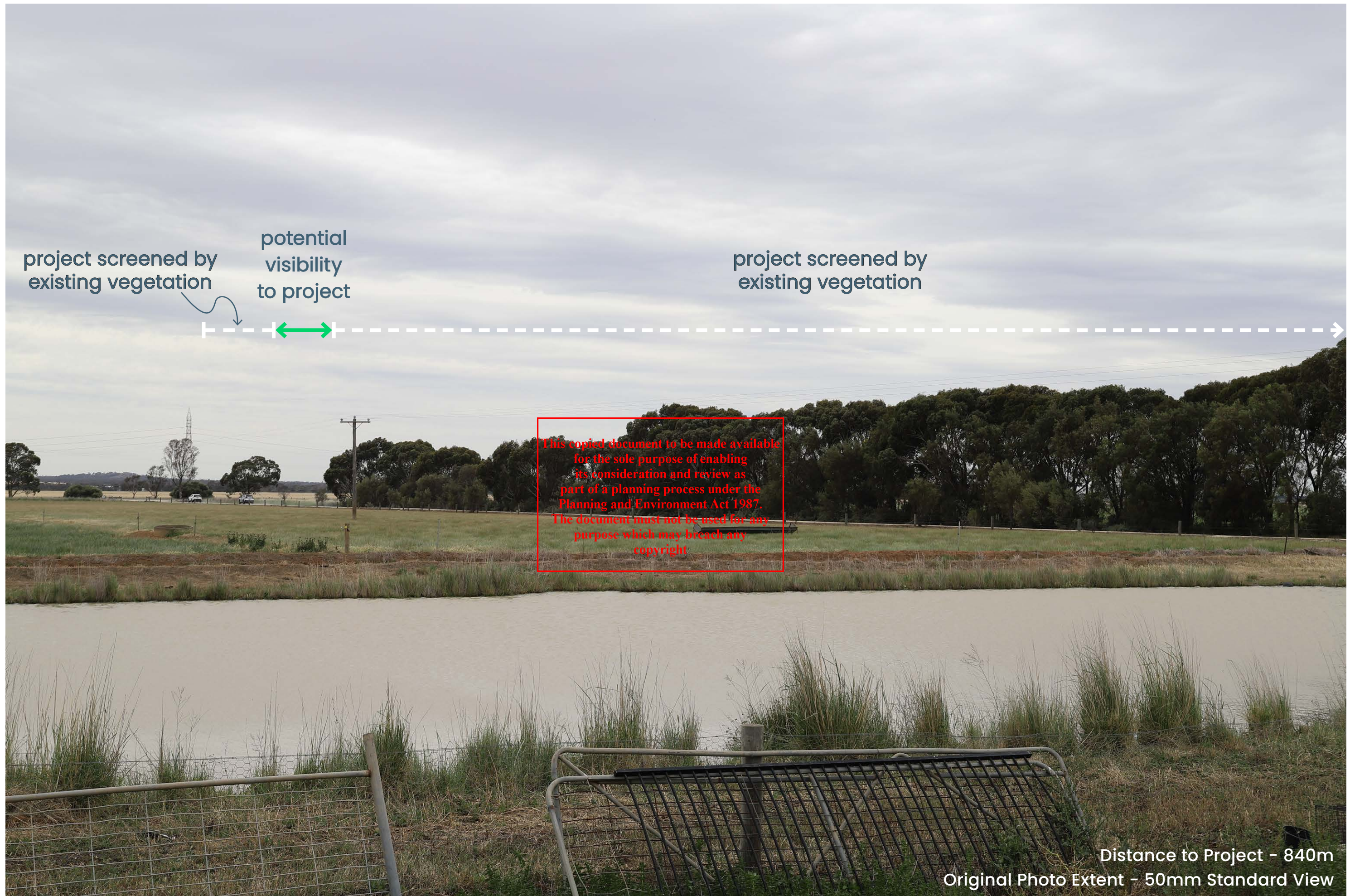
Mologa Solar Farm, Mologa VIC - Visual Assessment

VP6 (Photo 8832): From 7541 Bendigo-Pyramid Rd, looking ESE towards the Project
Camera Match 3D Model to Photo (Wire Frame)

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PLAN**

DATE: 2026-04-22
JOB NO: P0058365
DWG NO: VP_6B
REV: -



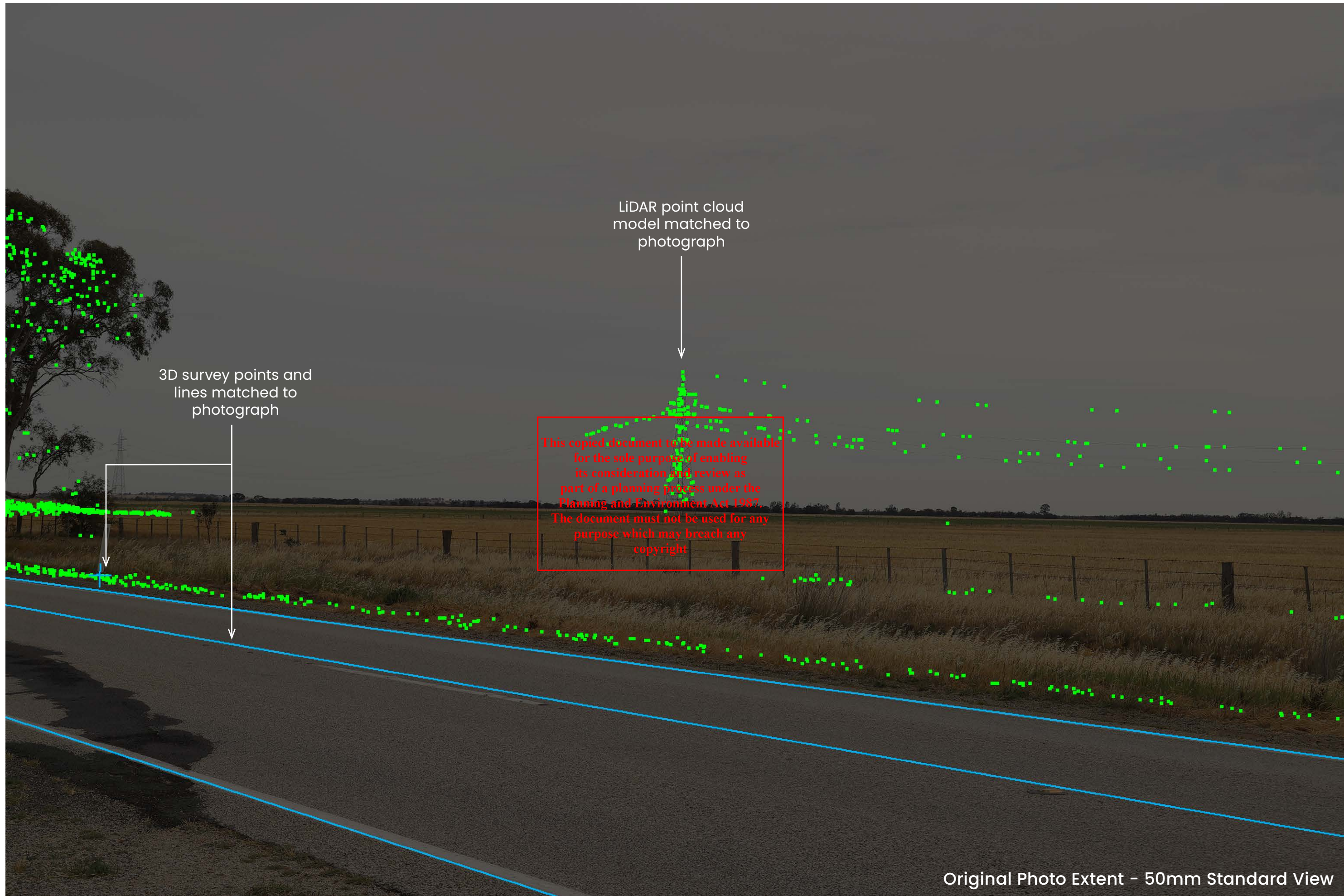




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Original Photo Extent – 50mm Standard View





LiDAR point cloud
model matched to
photograph

3D survey points and
lines matched to
photograph

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Original Photo Extent - 50mm Standard View



Mologa Solar Farm, Mologa VIC – Visual Assessment
VP11 (Photo 8818): Along Bendigo-Pyramid Rd, looking NE towards the Project
Camera Match 3D Model to Photo (Wire Frame)

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DATE: 2026-04-22
JOB NO: P0058365
DWG NO: VP_11B
REV: -

Proposed HV Tower (60m max)
and gantries (24.3m max)

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Distance to Project - 30m
Original Photo Extent - 50mm Standard View



Mologa Solar Farm, Mologa VIC - Visual Assessment

VP11 (Photo 8818): Along Bendigo-Pyramid Rd, looking NE towards the Project
Photomontage - Proposed Development

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DATE: 2026-04-22
JOB NO: P0058365
DWG NO: VP_11C
REV: -

Proposed HV Tower (60m max)
and gantries (24.3m max)

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Distance to Project - 30m
Original Photo Extent - 50mm Standard View



Mologa Solar Farm, Mologa VIC - Visual Assessment

VP11 (Photo 8818): Along Bendigo-Pyramid Rd, looking NE towards the Project
Photomontage - Proposed Development with Landscaping at 5 Years Growth

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PLAN**

DATE: 2026-04-22
JOB NO: P0058365
DWG NO: VP_11D
REV: -

Appendix B: ForgeSolar's GlareGauge

Glare analysis results
0° Resting angle scenario
(Worst-case scenario)

Glare analysis results
3° Resting angle scenario

4° Resting angle scenario
(No glare predicted)

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FORGESOLAR GLARE ANALYSIS

Project: **P0058365 Mologa Solar Farm**

Site configuration: **Layout20251124A_00deg**

Created 04 Dec, 2025

Updated 04 Dec, 2025

Time-step 1 minute

Timezone offset UTC10

Minimum sun altitude 0.0 deg

DNI peaks at 1,000.0 W/m²

Category 100 MW to 1 GW

Site ID 166330.27755

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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

Glare with potential for temporary after-image predicted

PV Array	Tilt °	Orient °	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
PV array A_2-8m	SA tracking	SA tracking	595	9.9	2,549	42.5	-
PV array A_4-0m	SA tracking	SA tracking	209	3.5	658	11.0	-
PV array B_2-8m	SA tracking	SA tracking	410	6.8	432	7.2	-
PV array B_4-0m	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
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	377	6.3	2,774	46.2
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	238	4.0	513	8.6
Route5_Prices Rd	155	2.6	341	5.7
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route7_Yarrawalla East Rd	223	3.7	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	0	0.0	0	0.0
OP 1	204	3.4	11	0.2
OP 2	0	0.0	0	0.0
OP 3	17	0.3	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0

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Component Data

PV Arrays

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Name: PV array A_2-8m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 0.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159543	144.163328	94.41	1.81	96.22
2	-36.167604	144.163321	94.68	1.81	96.49
3	-36.167605	144.149709	94.59	1.81	96.41
4	-36.174777	144.149704	95.60	1.81	97.41
5	-36.174777	144.149559	95.62	1.81	97.43
6	-36.174897	144.149342	95.63	1.81	97.44
7	-36.174893	144.132386	95.73	1.81	97.54
8	-36.174920	144.132201	95.79	1.81	97.60
9	-36.174814	144.131967	95.75	1.81	97.56
10	-36.174629	144.132027	95.76	1.81	97.57
11	-36.173203	144.132015	95.63	1.81	97.44
12	-36.172509	144.132591	95.67	1.81	97.48
13	-36.172077	144.132892	95.59	1.81	97.40
14	-36.171776	144.133014	95.52	1.81	97.33
15	-36.171435	144.132997	95.53	1.81	97.34
16	-36.171232	144.132814	95.51	1.81	97.32
17	-36.170551	144.132354	95.52	1.81	97.33
18	-36.170361	144.131993	95.48	1.81	97.29
19	-36.167968	144.131974	95.60	1.81	97.41
20	-36.165131	144.131978	95.16	1.81	96.98
21	-36.164121	144.131988	94.96	1.81	96.78
22	-36.163482	144.132003	94.96	1.81	96.77
23	-36.162143	144.131970	94.87	1.81	96.68
24	-36.161429	144.131969	94.75	1.81	96.57
25	-36.160309	144.131911	94.67	1.81	96.48
26	-36.155567	144.131901	94.33	1.81	96.14
27	-36.155566	144.134576	94.16	1.81	95.99
28	-36.155521	144.135050	94.16	1.81	95.97
29	-36.155518	144.154157	93.90	1.81	95.71
30	-36.155535	144.154184	93.90	1.81	95.71
31	-36.155543	144.159156	94.13	1.81	95.94
32	-36.155517	144.159677	94.12	1.81	95.93
33	-36.155541	144.161134	93.69	1.81	95.50
34	-36.155562	144.161233	93.78	1.81	95.59
35	-36.155571	144.162005	94.08	1.81	95.89
36	-36.156346	144.162177	94.27	1.81	96.08
37	-36.157888	144.162332	94.27	1.81	96.08
38	-36.158103	144.162238	94.23	1.81	96.04
39	-36.158277	144.162313	94.22	1.81	96.04
40	-36.158424	144.162455	94.22	1.81	96.03
41	-36.158669	144.162576	94.24	1.81	96.06
42	-36.159027	144.162703	94.25	1.81	96.07
43	-36.159199	144.162739	94.24	1.81	96.05
44	-36.159283	144.162778	94.22	1.81	96.04
45	-36.159367	144.162947	94.25	1.81	96.06
46	-36.159375	144.163170	94.33	1.81	96.14
47	-36.159428	144.163257	94.34	1.81	96.15
48	-36.159479	144.163309	94.38	1.81	96.19

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Name: PV array A_4-0m
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.3402857142857143
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



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1	-36.159543	144.163328	94.41	2.98	97.40
2	-36.167604	144.163321	94.68	2.98	97.66
3	-36.167605	144.149709	94.59	2.98	97.58
4	-36.174777	144.149704	95.60	2.98	98.59
5	-36.174777	144.149559	95.62	2.98	98.60
6	-36.174897	144.149342	95.63	2.98	98.61
7	-36.174893	144.132386	95.73	2.98	98.71
8	-36.174920	144.132201	95.79	2.98	98.77
9	-36.174814	144.131967	95.75	2.98	98.73
10	-36.174629	144.132027	95.76	2.98	98.75
11	-36.173203	144.132015	95.63	2.98	98.61
12	-36.172509	144.132591	95.67	2.98	98.65
13	-36.172077	144.132892	95.59	2.98	98.57
14	-36.171776	144.133014	95.52	2.98	98.51
15	-36.171435	144.132997	95.53	2.98	98.51
16	-36.171232	144.132814	95.51	2.98	98.49
17	-36.170551	144.132354	95.52	2.98	98.51
18	-36.170361	144.131993	95.48	2.98	98.46
19	-36.167968	144.131974	95.60	2.98	98.58
20	-36.165131	144.131978	95.16	2.98	98.15
21	-36.164121	144.131988	94.96	2.98	97.95
22	-36.163482	144.132003	94.96	2.98	97.94
23	-36.162143	144.131970	94.87	2.98	97.86
24	-36.161429	144.131969	94.75	2.98	97.74
25	-36.160309	144.131911	94.67	2.98	97.65
26	-36.155567	144.131901	94.33	2.98	97.32
27	-36.155566	144.134376	94.16	2.98	97.17
28	-36.155521	144.135050	94.16	2.98	97.14
29	-36.155518	144.154157	93.90	2.98	96.89
30	-36.155535	144.154184	93.90	2.98	96.89
31	-36.155543	144.159156	94.13	2.98	97.11
32	-36.155517	144.159677	94.12	2.98	97.11
33	-36.155541	144.161134	93.69	2.98	96.67
34	-36.155562	144.161233	93.78	2.98	96.77
35	-36.155571	144.162005	94.08	2.98	97.06
36	-36.156346	144.162177	94.27	2.98	97.25
37	-36.157888	144.162332	94.27	2.98	97.26
38	-36.158103	144.162238	94.23	2.98	97.21
39	-36.158277	144.162313	94.22	2.98	97.21
40	-36.158424	144.162455	94.22	2.98	97.20
41	-36.158669	144.162576	94.24	2.98	97.23
42	-36.159027	144.162703	94.25	2.98	97.24
43	-36.159199	144.162739	94.24	2.98	97.22
44	-36.159283	144.162778	94.22	2.98	97.21
45	-36.159367	144.162947	94.25	2.98	97.23
46	-36.159375	144.163170	94.33	2.98	97.31
47	-36.159428	144.163257	94.34	2.98	97.32
48	-36.159479	144.163309	94.38	2.98	97.37

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Name: PV array B_2-8m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 0.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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1	-36.159528	144.163607	94.47	1.81	96.28
2	-36.159533	144.163826	94.34	1.81	96.15
3	-36.159553	144.163917	94.33	1.81	96.14
4	-36.159853	144.164592	94.34	1.81	96.15
5	-36.159909	144.164866	94.37	1.81	96.18
6	-36.159907	144.165006	94.39	1.81	96.20
7	-36.159693	144.166062	94.49	1.81	96.30
8	-36.159636	144.166683	94.42	1.81	96.23
9	-36.159596	144.166900	94.34	1.81	96.15
10	-36.159603	144.167143	94.39	1.81	96.20
11	-36.159653	144.167253	94.44	1.81	96.25
12	-36.159750	144.167295	94.42	1.81	96.23
13	-36.159968	144.167287	94.31	1.81	96.12
14	-36.160157	144.167257	94.22	1.81	96.03
15	-36.160334	144.167169	94.21	1.81	96.02
16	-36.160434	144.167070	94.19	1.81	96.00
17	-36.160502	144.166937	94.19	1.81	96.00
18	-36.160512	144.166839	94.20	1.81	96.01
19	-36.160477	144.166749	94.21	1.81	96.02
20	-36.160457	144.166487	94.20	1.81	96.01
21	-36.160654	144.166385	94.20	1.81	96.01
22	-36.160848	144.166360	94.19	1.81	96.00
23	-36.161107	144.166264	94.18	1.81	95.99
24	-36.161306	144.166394	94.17	1.81	95.98
25	-36.161523	144.166558	94.16	1.81	95.97
26	-36.161773	144.166614	94.15	1.81	95.96
27	-36.161934	144.166548	94.16	1.81	95.97
28	-36.161991	144.166430	94.16	1.81	95.97
29	-36.162074	144.166274	94.17	1.81	95.99
30	-36.162269	144.166258	94.17	1.81	95.98
31	-36.162541	144.166253	94.16	1.81	95.86
32	-36.162636	144.166279	94.12	1.81	95.93
33	-36.162700	144.166279	94.14	1.81	95.95
34	-36.162806	144.166249	94.16	1.81	95.97
35	-36.163195	144.166006	94.17	1.81	95.98
36	-36.163237	144.165965	94.17	1.81	95.98
37	-36.163265	144.165908	94.17	1.81	95.98
38	-36.163386	144.165724	94.15	1.81	95.96
39	-36.163629	144.165785	94.17	1.81	95.98
40	-36.163707	144.165862	94.17	1.81	95.98
41	-36.163757	144.165899	94.17	1.81	95.98
42	-36.163988	144.166026	94.17	1.81	95.98
43	-36.163971	144.166267	94.17	1.81	95.98
44	-36.163941	144.166359	94.17	1.81	95.98
45	-36.163955	144.166457	94.17	1.81	95.98
46	-36.164117	144.166852	94.18	1.81	95.99
47	-36.164522	144.167610	94.19	1.81	96.00
48	-36.164779	144.168416	94.19	1.81	96.00
49	-36.164837	144.168965	94.22	1.81	96.03
50	-36.164912	144.169571	94.39	1.81	96.20
51	-36.165079	144.170588	94.45	1.81	96.26
52	-36.165301	144.170809	94.47	1.81	96.28
53	-36.165408	144.170853	94.48	1.81	96.29
54	-36.166446	144.170809	94.81	1.81	96.62
55	-36.166587	144.170693	94.92	1.81	96.74
56	-36.167186	144.169092	94.86	1.81	96.67
57	-36.167343	144.168415	94.70	1.81	96.51
58	-36.167476	144.167636	94.64	1.81	96.45
59	-36.167575	144.167481	94.65	1.81	96.46



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Name: PV array B_4-0m
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.3402857142857143
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159528	144.163607	94.47	2.98	97.45
2	-36.159533	144.163826	94.34	2.98	97.33
3	-36.159553	144.163917	94.33	2.98	97.32
4	-36.159853	144.164592	94.34	2.98	97.32
5	-36.159909	144.164866	94.37	2.98	97.35
6	-36.159907	144.165006	94.39	2.98	97.37
7	-36.159693	144.166062	94.49	2.98	97.48
8	-36.159636	144.166683	94.42	2.98	97.40
9	-36.159596	144.166900	94.34	2.98	97.32
10	-36.159603	144.167143	94.39	2.98	97.37
11	-36.159653	144.167253	94.44	2.98	97.43
12	-36.159750	144.167295	94.42	2.98	97.40
13	-36.159968	144.167287	94.31	2.98	97.29
14	-36.160157	144.167257	94.22	2.98	97.21
15	-36.160334	144.167169	94.21	2.98	97.19
16	-36.160434	144.167070	94.19	2.98	97.17
17	-36.160502	144.166937	94.19	2.98	97.17
18	-36.160512	144.166839	94.20	2.98	97.18
19	-36.160477	144.166749	94.21	2.98	97.19
20	-36.160457	144.166487	94.20	2.98	97.19
21	-36.160654	144.166385	94.20	2.98	97.18
22	-36.160848	144.166360	94.19	2.98	97.17
23	-36.161107	144.166264	94.18	2.98	97.16
24	-36.161306	144.166394	94.17	2.98	97.15
25	-36.161523	144.166558	94.16	2.98	97.14
26	-36.161773	144.166614	94.15	2.98	97.14
27	-36.161934	144.166548	94.16	2.98	97.14
28	-36.161991	144.166430	94.16	2.98	97.15
29	-36.162074	144.166274	94.17	2.98	97.16
30	-36.162269	144.166258	94.17	2.98	97.15
31	-36.162541	144.166253	94.08	2.98	97.03
32	-36.162636	144.166279	94.12	2.98	97.10
33	-36.162700	144.166279	94.14	2.98	97.12
34	-36.162806	144.166249	94.16	2.98	97.15
35	-36.163195	144.166006	94.17	2.98	97.15
36	-36.163237	144.165965	94.17	2.98	97.15
37	-36.163265	144.165908	94.17	2.98	97.15
38	-36.163386	144.165724	94.15	2.98	97.14
39	-36.163629	144.165785	94.17	2.98	97.16
40	-36.163707	144.165862	94.17	2.98	97.15
41	-36.163757	144.165899	94.17	2.98	97.15
42	-36.163988	144.166026	94.17	2.98	97.15
43	-36.163971	144.166267	94.17	2.98	97.15
44	-36.163941	144.166359	94.17	2.98	97.15
45	-36.163955	144.166457	94.17	2.98	97.15
46	-36.164117	144.166852	94.18	2.98	97.16
47	-36.164522	144.167610	94.19	2.98	97.17
48	-36.164779	144.168416	94.19	2.98	97.18
49	-36.164837	144.168965	94.22	2.98	97.20
50	-36.164912	144.169571	94.39	2.98	97.37
51	-36.165079	144.170588	94.45	2.98	97.44
52	-36.165301	144.170809	94.47	2.98	97.46
53	-36.165408	144.170853	94.48	2.98	97.46
54	-36.166446	144.170809	94.81	2.98	97.80
55	-36.166587	144.170693	94.92	2.98	97.91
56	-36.167186	144.169092	94.86	2.98	97.84
57	-36.167343	144.168415	94.70	2.98	97.68
58	-36.167476	144.167636	94.64	2.98	97.62
59	-36.167575	144.167481	94.65	2.98	97.63



Route Receptors

Name: Route1_Bendigo-Pyramid Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.183986	144.131610	96.70	2.40	99.10
2	-36.182347	144.131608	96.76	2.40	99.16
3	-36.179482	144.131600	96.35	2.40	98.75
4	-36.175530	144.131599	96.08	2.40	98.48
5	-36.174954	144.131599	96.17	2.40	98.57
6	-36.174251	144.131598	96.11	2.40	98.51
7	-36.171267	144.131593	96.00	2.40	98.40
8	-36.166132	144.131582	95.74	2.40	98.14
9	-36.164667	144.131580	95.54	2.40	97.94
10	-36.162902	144.131576	95.40	2.40	97.80
11	-36.162004	144.131574	95.35	2.40	97.75
12	-36.159744	144.131569	95.25	2.40	97.65
13	-36.155378	144.131559	94.75	2.40	97.15
14	-36.152699	144.131544	94.62	2.40	97.02
15	-36.149030	144.131551	94.36	2.40	96.76
16	-36.146478	144.131543	94.42	2.40	96.82

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Name: Route2_Mologa-Durham Ox Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.155377	144.178203	94.07	2.40	96.47
2	-36.155384	144.172741	94.30	2.40	96.70
3	-36.155380	144.167575	94.65	2.40	97.05
4	-36.155384	144.166789	94.89	2.40	97.29
5	-36.155385	144.165672	94.60	2.40	97.00
6	-36.155387	144.165371	94.61	2.40	97.01
7	-36.155389	144.164212	94.69	2.40	97.09
8	-36.155389	144.163502	94.65	2.40	97.05
9	-36.155387	144.160827	94.33	2.40	96.73
10	-36.155388	144.155026	94.17	2.40	96.57
11	-36.155390	144.149715	94.58	2.40	96.98
12	-36.155389	144.140177	94.67	2.40	97.07
13	-36.155388	144.134166	94.46	2.40	96.86
14	-36.155378	144.131559	94.75	2.40	97.15

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Name: Route3_Old Church Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.155389	144.163504	94.65	2.40	97.05
2	-36.155926	144.163507	94.51	2.40	96.91
3	-36.157232	144.163522	94.43	2.40	96.83
4	-36.158359	144.163518	94.36	2.40	96.77
5	-36.158875	144.163519	94.34	2.40	96.74
6	-36.160178	144.163523	94.41	2.40	96.81
7	-36.161876	144.163524	94.36	2.40	96.76
8	-36.163721	144.163520	94.48	2.40	96.88
9	-36.165373	144.163518	94.50	2.40	96.90
10	-36.167294	144.163514	94.61	2.40	97.01
11	-36.168821	144.163514	94.71	2.40	97.11
12	-36.170997	144.163486	94.81	2.40	97.21
13	-36.175947	144.163472	95.17	2.40	97.57
14	-36.176864	144.163486	95.27	2.40	97.67

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Name: Route4_Mitiamo-Kerang Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.146460	144.159408	93.93	2.40	96.33
2	-36.149835	144.161824	94.23	2.40	96.63
3	-36.153500	144.164403	94.14	2.40	96.54
4	-36.154832	144.165389	94.44	2.40	96.84
5	-36.155148	144.165577	94.30	2.40	96.70
6	-36.155385	144.165672	94.60	2.40	97.00
7	-36.155557	144.165714	94.41	2.40	96.81
8	-36.156050	144.165978	94.07	2.40	96.47
9	-36.156317	144.166152	94.07	2.40	96.47
10	-36.156638	144.166409	94.16	2.40	96.56
11	-36.157178	144.166857	94.18	2.40	96.58
12	-36.157780	144.167480	94.16	2.40	96.56
13	-36.158345	144.168044	94.24	2.40	96.64
14	-36.158692	144.168290	94.29	2.40	96.69
15	-36.159378	144.168745	94.56	2.40	96.96
16	-36.160212	144.169363	94.45	2.40	96.85
17	-36.162017	144.170421	94.40	2.40	96.80
18	-36.162855	144.170982	94.53	2.40	96.93
19	-36.163148	144.171464	94.39	2.40	96.79
20	-36.163375	144.171748	94.38	2.40	96.78
21	-36.165694	144.173329	94.45	2.40	96.85
22	-36.166410	144.173650	94.40	2.40	96.80
23	-36.166765	144.173874	95.00	2.40	97.40
24	-36.167691	144.174518	94.33	2.40	96.73
25	-36.168789	144.175334	94.30	2.40	96.70
26	-36.170732	144.176679	94.16	2.40	96.56
27	-36.174527	144.179522	94.92	2.40	97.32
28	-36.174808	144.179845	94.91	2.40	97.31
29	-36.175230	144.180627	94.81	2.40	97.21

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Name: Route5_Prices Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.146488	144.165966	93.83	2.40	96.23
2	-36.147532	144.165969	93.86	2.40	96.26
3	-36.148858	144.165963	93.92	2.40	96.32
4	-36.150622	144.165957	93.91	2.40	96.31
5	-36.152439	144.165972	94.20	2.40	96.60
6	-36.153596	144.165961	94.00	2.40	96.40
7	-36.153876	144.165947	94.10	2.40	96.50
8	-36.154613	144.165744	94.27	2.40	96.67
9	-36.155014	144.165656	94.31	2.40	96.71
10	-36.155188	144.165594	94.39	2.40	96.79

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Name: Route6_Mologa-Durham Ox Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.152712	144.121214	94.48	2.40	96.88
2	-36.152700	144.123008	94.58	2.40	96.98
3	-36.152696	144.124631	94.49	2.40	96.89
4	-36.152697	144.127178	94.43	2.40	96.83
5	-36.152693	144.129960	94.48	2.40	96.88
6	-36.152699	144.131544	94.62	2.40	97.02

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Name: Route7_Yarrowalla East Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.182348	144.125452	96.36	2.40	98.76
2	-36.182347	144.129143	96.42	2.40	98.82
3	-36.182347	144.131608	96.76	2.40	99.16
4	-36.182339	144.131855	96.52	2.40	98.92
5	-36.182343	144.134099	96.47	2.40	98.87
6	-36.182338	144.135738	96.55	2.40	98.95
7	-36.182338	144.138088	96.54	2.40	98.94
8	-36.182343	144.140226	96.46	2.40	98.86
9	-36.182340	144.142155	96.36	2.40	98.76
10	-36.182339	144.144521	96.18	2.40	98.58
11	-36.182338	144.146538	95.58	2.40	97.98
12	-36.182342	144.150182	96.62	2.40	99.02
13	-36.182352	144.153114	95.82	2.40	98.22
14	-36.182357	144.156136	95.72	2.40	98.12

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Flight Path Receptors

Name: FP1_Pyramid Hill 00

Description:

Threshold height: 15 m

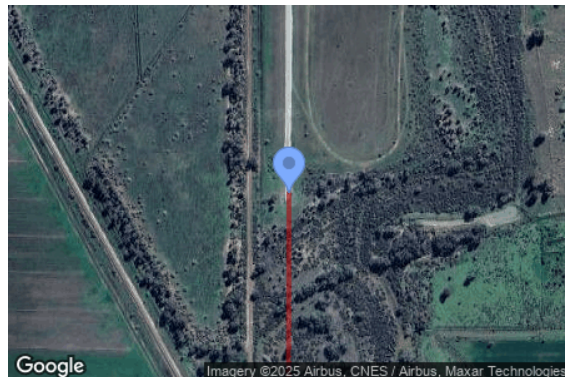
Direction: 0.2°

Glide slope: 3.0°

Pilot view restricted? Yes

Vertical view: 30.0°

Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-36.067559	144.126754	89.06	15.24	104.30
Two-mile	-36.096471	144.126647	90.79	182.20	272.99

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Name: FP2_Pyramid Hill 18

Description:

Threshold height: 15 m

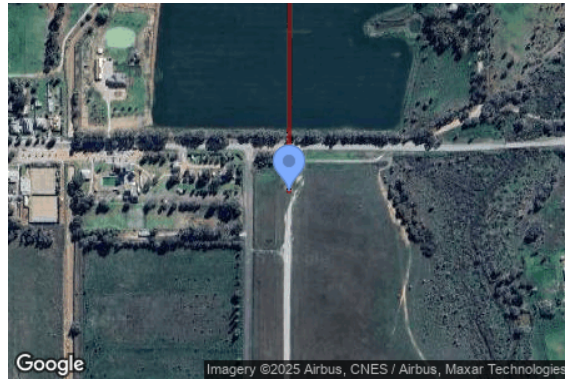
Direction: 180.2°

Glide slope: 3.0°

Pilot view restricted? Yes

Vertical view: 30.0°

Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-36.055791	144.126797	89.04	15.24	104.28
Two-mile	-36.026879	144.126922	86.79	186.18	272.97

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-36.155218	144.165162	94.35	1.50
OP 2	2	-36.161596	144.126923	95.19	1.50
OP 3	3	-36.159607	144.172394	94.75	1.50
OP 4	4	-36.180479	144.150734	95.89	1.50
OP 5	5	-36.149123	144.126522	94.48	1.50

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Glare Analysis Results

Summary of Results Glare with potential for temporary after-image predicted

PV Array	Tilt °	Orient °	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
PV array A_2-8m	SA tracking	SA tracking	595	9.9	2,549	42.5	-
PV array A_4-0m	SA tracking	SA tracking	209	3.5	658	11.0	-
PV array B_2-8m	SA tracking	SA tracking	410	6.8	432	7.2	-
PV array B_4-0m	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
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	377	9.1	2,774	46.2
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	238	4.0	513	8.6
Route5_Prices Rd	155	2.6	341	5.7
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	223	3.7	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	0	0.0	0	0.0
OP 1	204	3.4	11	0.2
OP 2	0	0.0	0	0.0
OP 3	17	0.3	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0

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PV: PV array A_2-8m potential temporary after-image

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route2_Mologa-Durham Ox Rd	168	2.8	2,116	35.3
Route4_Mitiamo-Kerang Rd	51	0.8	81	1.4
Route5_Prices Rd	155	2.6	341	5.7
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	0	0.0	0	0.0
OP 1	204	3.4	11	0.2
OP 3	17	0.3	0	0.0
OP 2	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0

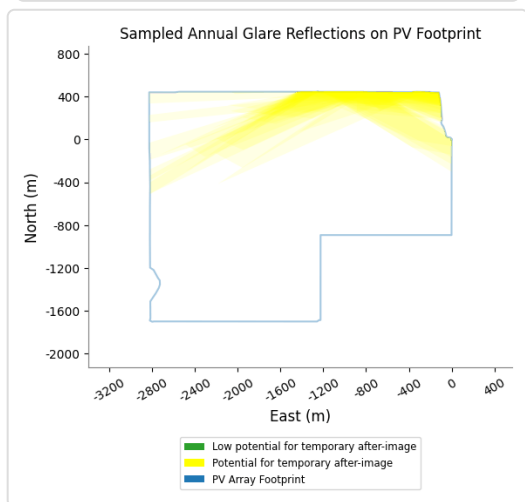
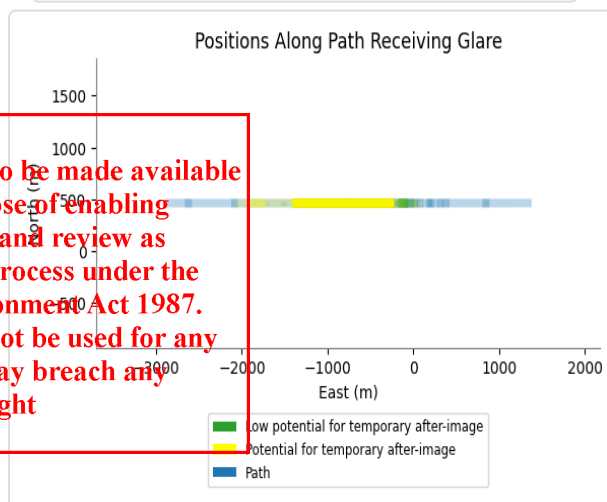
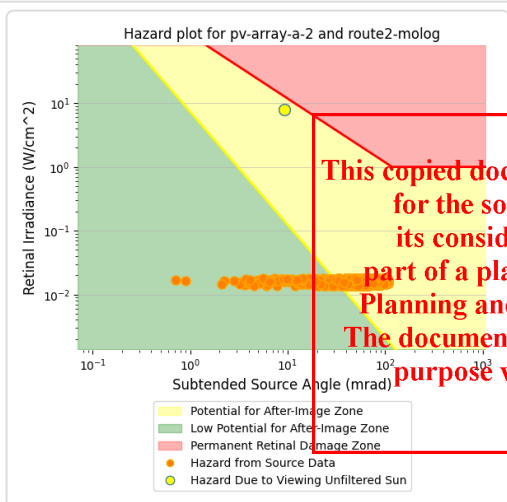
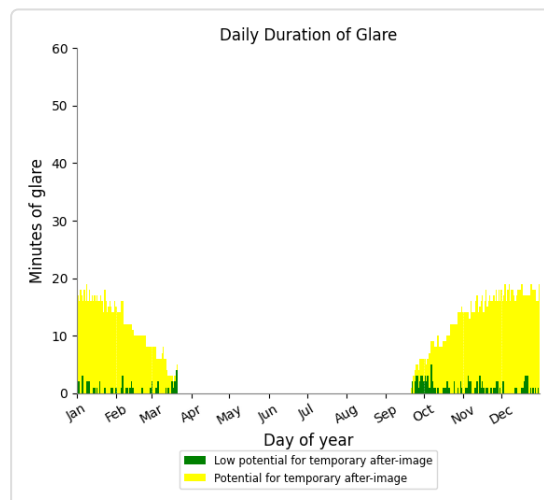
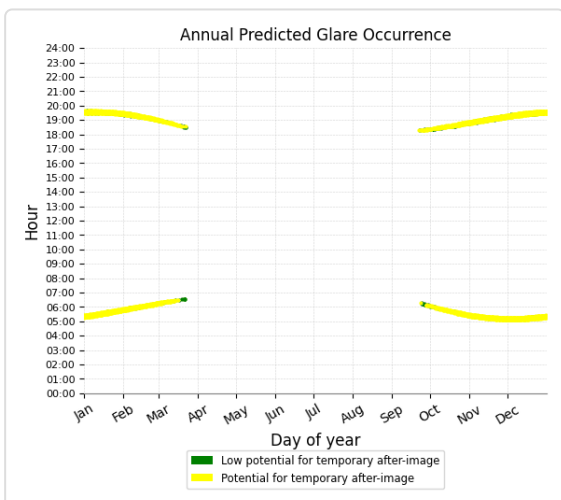
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PV array A_2-8m and Route: Route2_Mologa-Durham Ox Rd

Yellow glare: 2,116 min.

Green glare: 168 min.

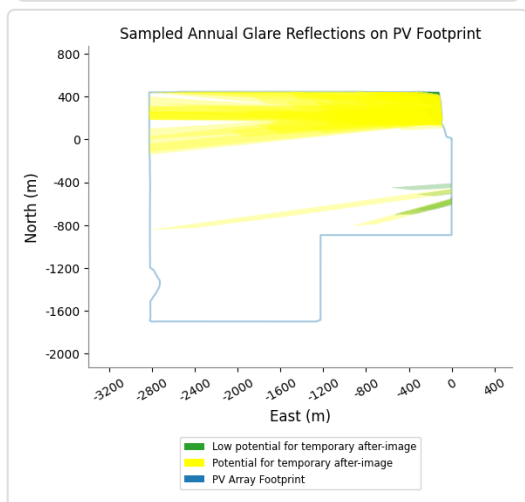
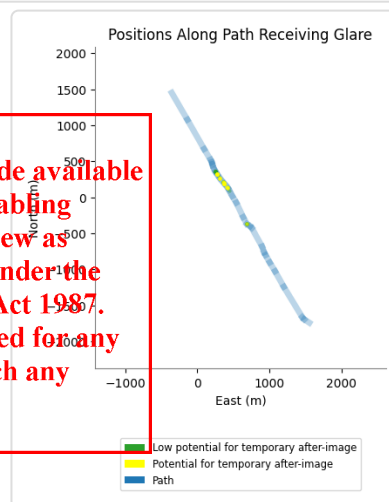
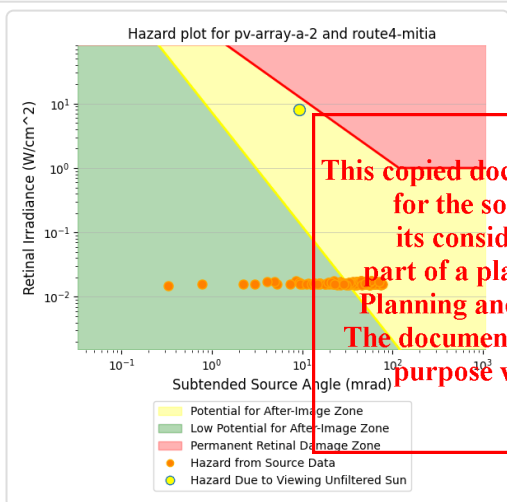
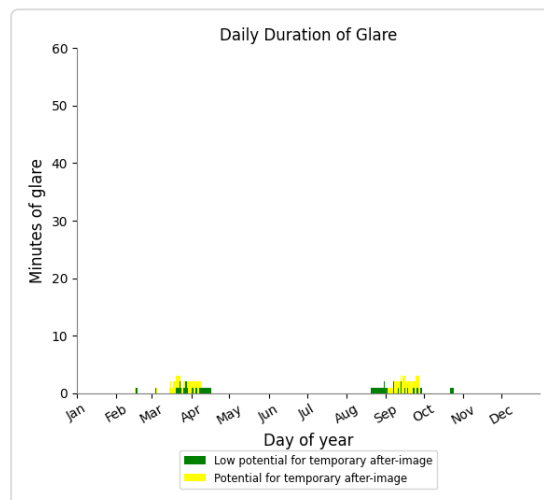
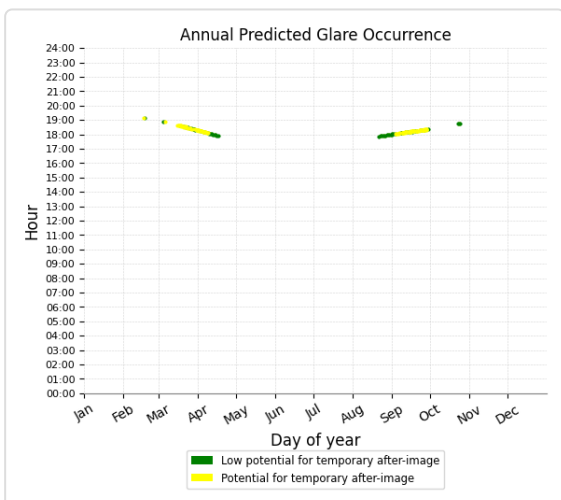


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PV array A_2-8m and Route: Route4_Mitiamo-Kerang Rd

Yellow glare: 81 min.

Green glare: 51 min.

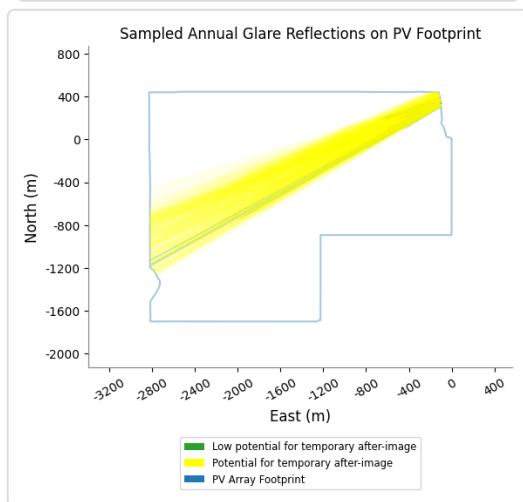
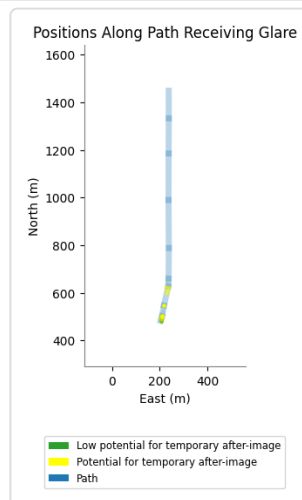
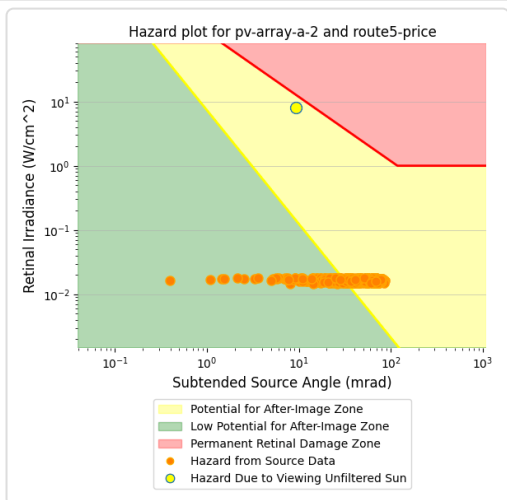
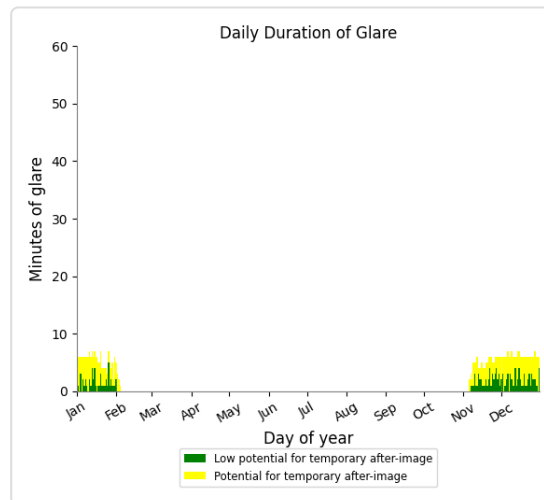
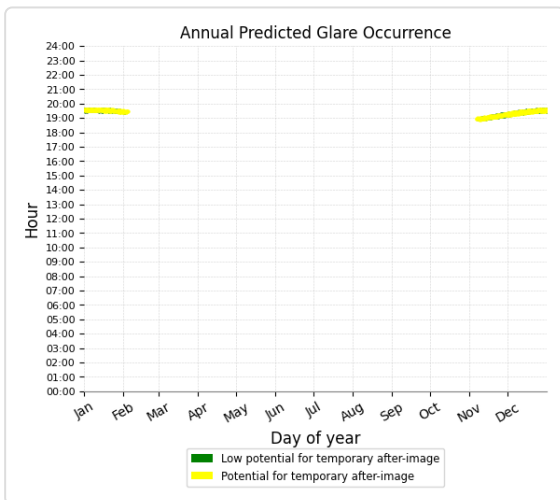


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PV array A_2-8m and Route: Route5_Prices Rd

Yellow glare: 341 min.

Green glare: 155 min.



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PV array A_2-8m and Route: Route1_Bendigo-Pyramid Rd

No glare found

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PV array A_2-8m and Route: Route3_Old Church Rd

No glare found

PV array A_2-8m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array A_2-8m and Route: Route7_Yarrawalla East Rd

No glare found

PV array A_2-8m and FP: FP1_Pyramid Hill 00

No glare found

PV array A_2-8m and FP: FP2_Pyramid Hill 18

No glare found

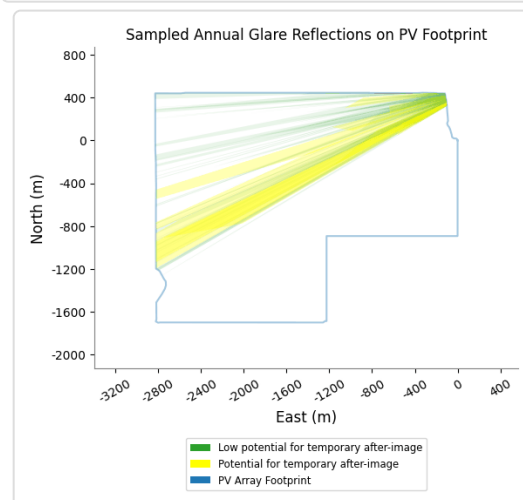
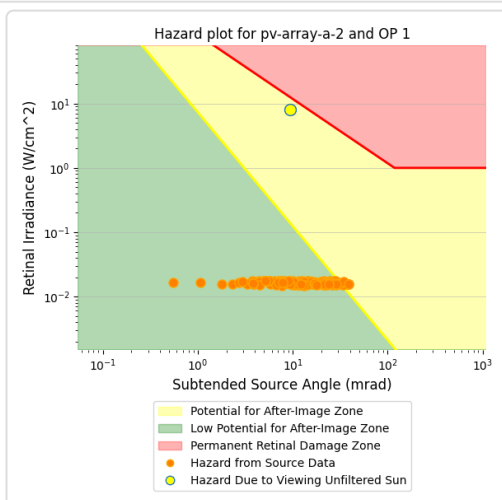
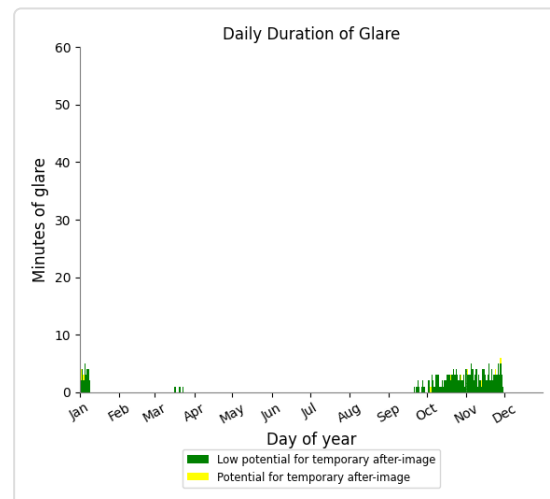
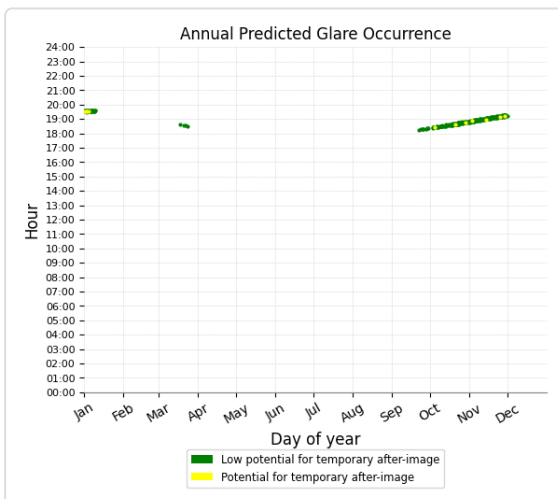
PV array A_2-8m and OP 1

Yellow glare: 11 min.

Green glare: 204 min.

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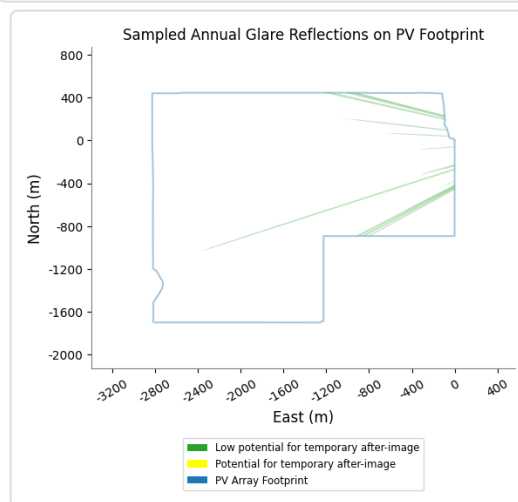
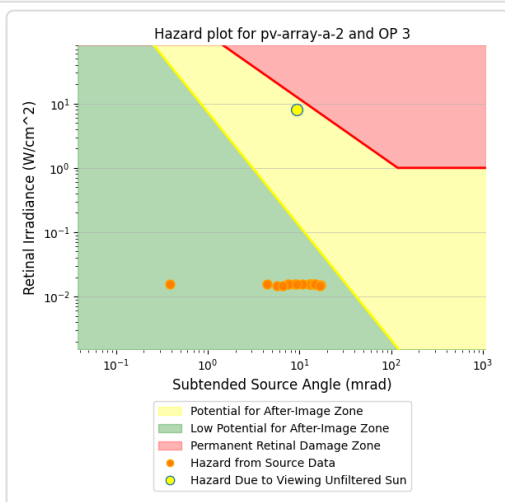
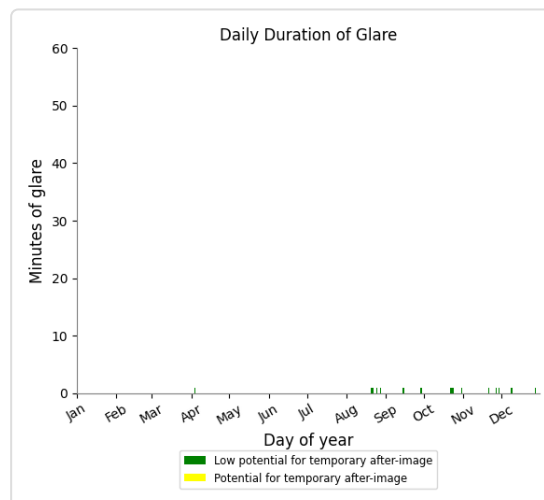
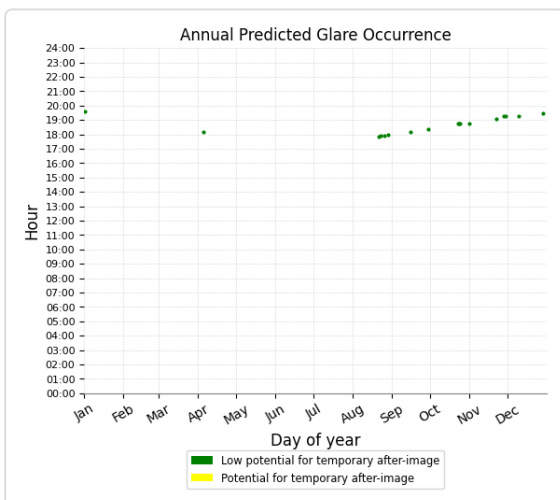
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PV array A_2-8m and OP 3

Yellow glare: none

Green glare: 17 min.



PV array A_2-8m and OP 2

No glare found

PV array A_2-8m and OP 4

No glare found

PV array A_2-8m and OP 5

No glare found

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PV: PV array A_4-0m potential temporary after-image

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route2_Mologa-Durham Ox Rd	209	3.5	658	11.0
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

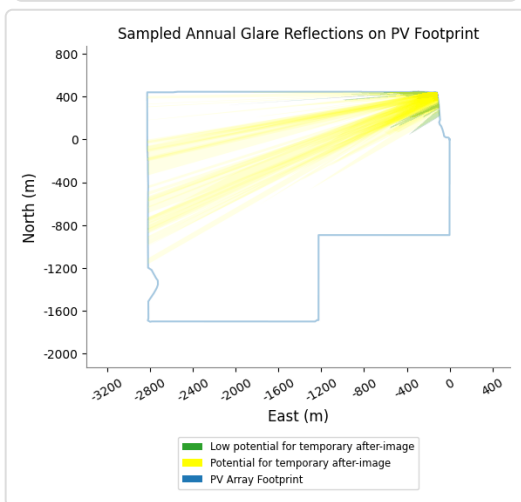
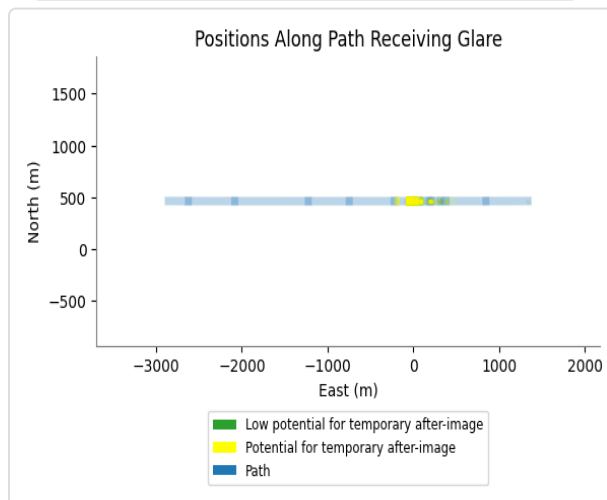
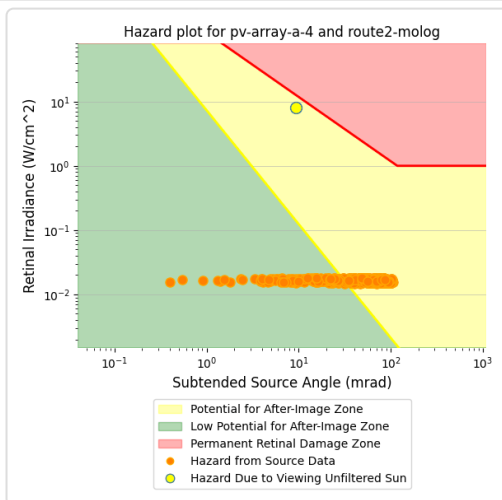
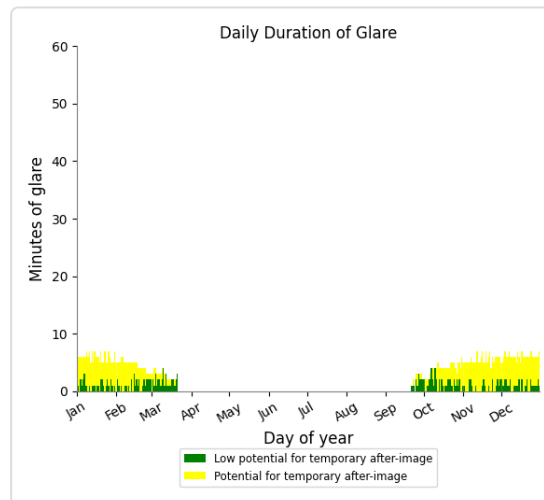
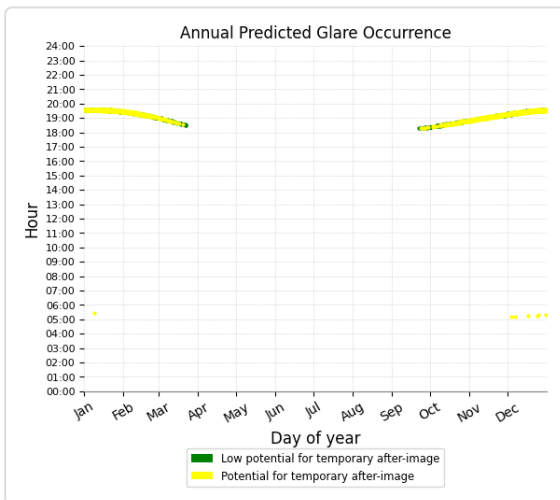
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PV array A_4-0m and Route: Route2_Mologa-Durham Ox Rd

Yellow glare: 658 min.

Green glare: 209 min.



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PV array A_4-0m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array A_4-0m and Route: Route3_Old Church Rd

No glare found

PV array A_4-0m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array A_4-0m and Route: Route5_Prices Rd

No glare found

PV array A_4-0m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array A_4-0m and Route: Route7_Yarrawalla East Rd

No glare found

PV array A_4-0m and FP: FP1_Pyramid Hill 00

No glare found

PV array A_4-0m and FP: FP2_Pyramid Hill 18

No glare found

PV array A_4-0m and OP 1

No glare found

PV array A_4-0m and OP 2

No glare found

PV array A_4-0m and OP 3

No glare found

PV array A_4-0m and OP 4

No glare found

PV array A_4-0m and OP 5

No glare found

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PV: PV array B_2-8m potential temporary after-image

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route4_Mitiamo-Kerang Rd	187	3.1	432	7.2
Route7_Yarrawalla East Rd	223	3.7	0	0.0
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

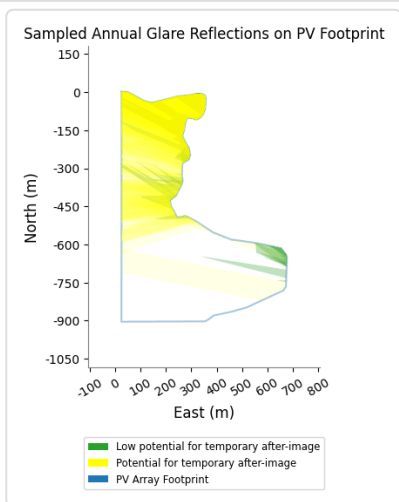
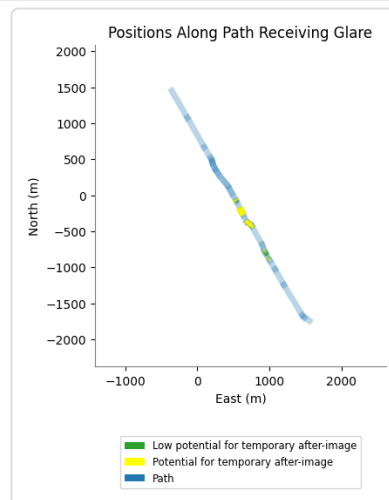
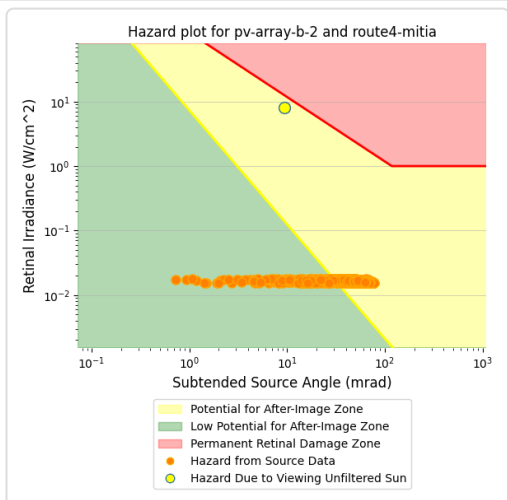
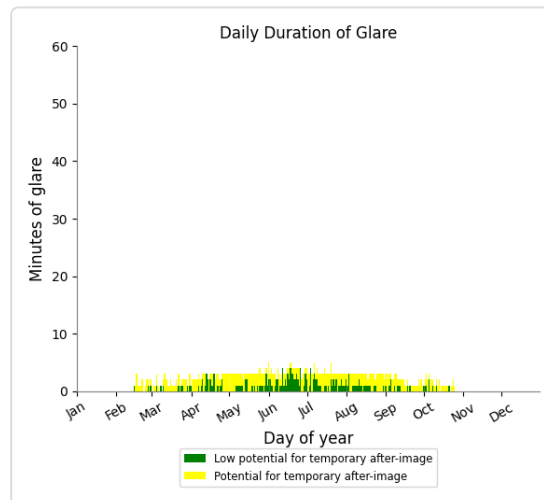
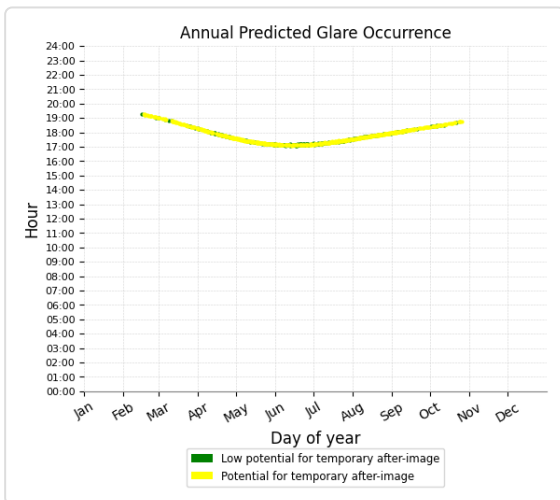
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PV array B_2-8m and Route: Route4_Mitiamo-Kerang Rd

Yellow glare: 432 min.

Green glare: 187 min.



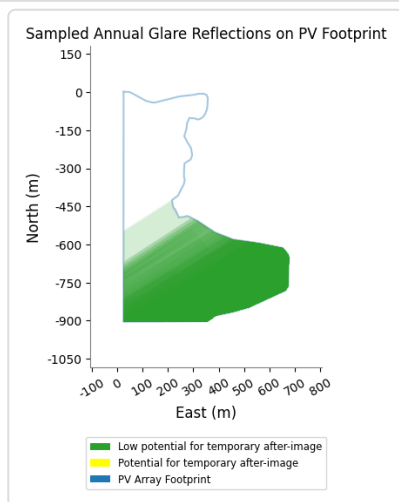
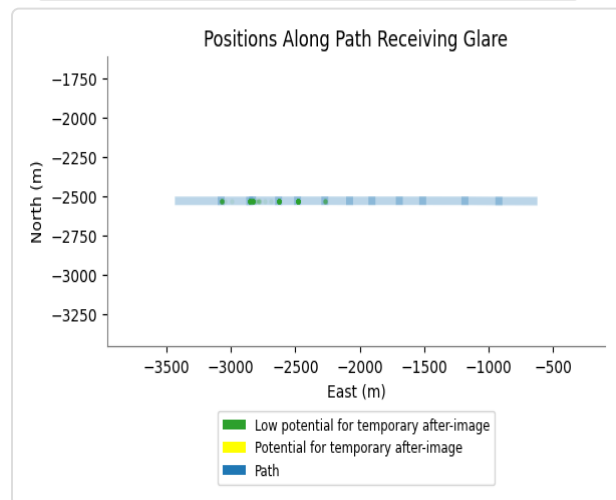
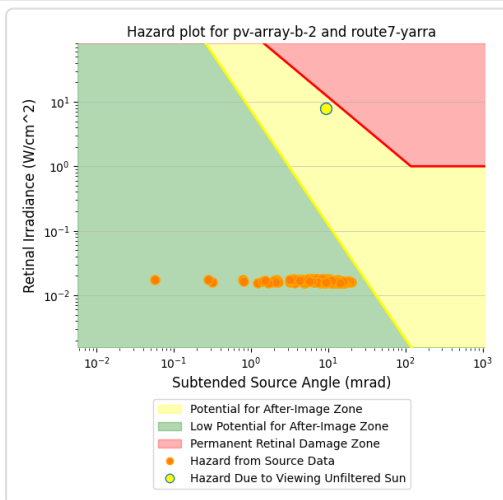
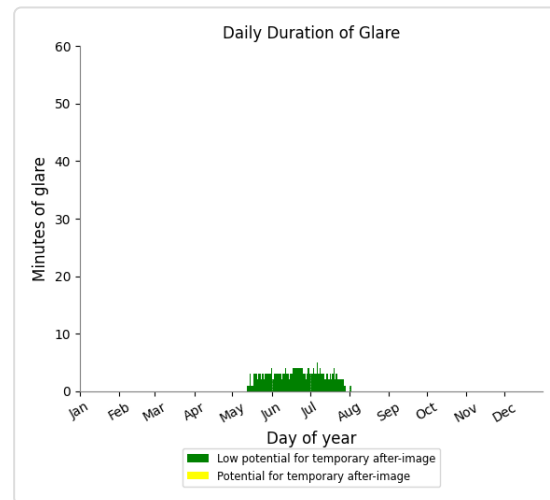
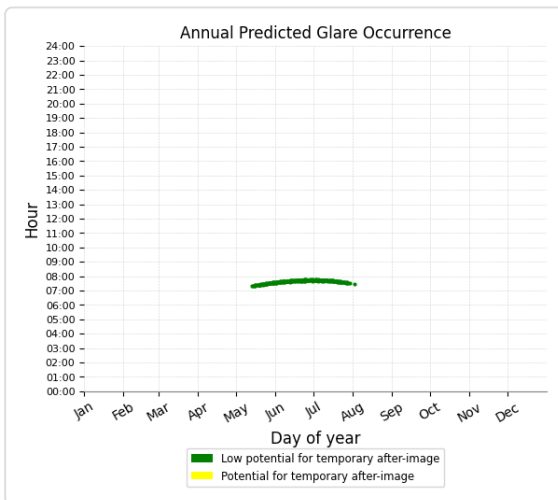
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PV array B_2-8m and Route: Route7_Yarrawalla East Rd

Yellow glare: none

Green glare: 223 min.



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PV array B_2-8m and Route: Route1_Bendigo-Pyramid Rd

No glare found

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PV array B_2-8m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array B_2-8m and Route: Route3_Old Church Rd

No glare found

PV array B_2-8m and Route: Route5_Prices Rd

No glare found

PV array B_2-8m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array B_2-8m and FP: FP1_Pyramid Hill 00

No glare found

PV array B_2-8m and FP: FP2_Pyramid Hill 18

No glare found

PV array B_2-8m and OP 1

No glare found

PV array B_2-8m and OP 2

No glare found

PV array B_2-8m and OP 3

No glare found

PV array B_2-8m and OP 4

No glare found

PV array B_2-8m and OP 5

No glare found

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PV: PV array B_4-0m no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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PV array B_4-0m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array B_4-0m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array B_4-0m and Route: Route3_Old Church Rd

No glare found

PV array B_4-0m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array B_4-0m and Route: Route5_Prices Rd

No glare found

PV array B_4-0m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array B_4-0m and Route: Route7_Yarrawalla East Rd

No glare found

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PV array B_4-0m and FP: FP1_Pyramid Hill 00

No glare found

PV array B_4-0m and FP: FP2_Pyramid Hill 18

No glare found

PV array B_4-0m and OP 1

No glare found

PV array B_4-0m and OP 2

No glare found

PV array B_4-0m and OP 3

No glare found

PV array B_4-0m and OP 4

No glare found

PV array B_4-0m and OP 5

No glare found

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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

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FORGESOLAR GLARE ANALYSIS

Project: **P0058365 Mologa Solar Farm**

Site configuration: **Layout20251124A_03deg**

Created 05 Dec, 2025

Updated 05 Dec, 2025

Time-step 1 minute

Timezone offset UTC10

Minimum sun altitude 0.0 deg

DNI peaks at 1,000.0 W/m²

Category 100 MW to 1 GW

Site ID 166442.27755

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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

Glare with potential for temporary after-image predicted

PV Array	Tilt °	Orient °	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
PV array A_2-8m	SA tracking	SA tracking	108	1.8	706	11.8	-
PV array A_4-0m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_2-8m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_4-0m	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
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	108	1.8	706	11.8
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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Component Data

PV Arrays

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Name: PV array A_2-8m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 3.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159543	144.163328	94.41	1.81	96.22
2	-36.167604	144.163321	94.68	1.81	96.49
3	-36.167605	144.149709	94.59	1.81	96.41
4	-36.174777	144.149704	95.60	1.81	97.41
5	-36.174777	144.149559	95.62	1.81	97.43
6	-36.174897	144.149342	95.63	1.81	97.44
7	-36.174893	144.132386	95.73	1.81	97.54
8	-36.174920	144.132201	95.79	1.81	97.60
9	-36.174814	144.131967	95.75	1.81	97.56
10	-36.174629	144.132027	95.76	1.81	97.57
11	-36.173203	144.132015	95.63	1.81	97.44
12	-36.172509	144.132591	95.67	1.81	97.48
13	-36.172077	144.132892	95.59	1.81	97.40
14	-36.171776	144.133014	95.52	1.81	97.33
15	-36.171435	144.132997	95.53	1.81	97.34
16	-36.171232	144.132814	95.51	1.81	97.32
17	-36.170551	144.132354	95.52	1.81	97.33
18	-36.170361	144.131993	95.48	1.81	97.29
19	-36.167968	144.131974	95.60	1.81	97.41
20	-36.165131	144.131978	95.16	1.81	96.98
21	-36.164121	144.131988	94.96	1.81	96.78
22	-36.163482	144.132003	94.96	1.81	96.77
23	-36.162143	144.131970	94.87	1.81	96.68
24	-36.161429	144.131969	94.75	1.81	96.57
25	-36.160309	144.131911	94.67	1.81	96.48
26	-36.155567	144.131901	94.33	1.81	96.14
27	-36.155566	144.134576	94.16	1.81	95.99
28	-36.155521	144.135050	94.16	1.81	95.97
29	-36.155518	144.154157	93.90	1.81	95.71
30	-36.155535	144.154184	93.90	1.81	95.71
31	-36.155543	144.159156	94.13	1.81	95.94
32	-36.155517	144.159677	94.12	1.81	95.93
33	-36.155541	144.161134	93.69	1.81	95.50
34	-36.155562	144.161233	93.78	1.81	95.59
35	-36.155571	144.162005	94.08	1.81	95.89
36	-36.156346	144.162177	94.27	1.81	96.08
37	-36.157888	144.162332	94.27	1.81	96.08
38	-36.158103	144.162238	94.23	1.81	96.04
39	-36.158277	144.162313	94.22	1.81	96.04
40	-36.158424	144.162455	94.22	1.81	96.03
41	-36.158669	144.162576	94.24	1.81	96.06
42	-36.159027	144.162703	94.25	1.81	96.07
43	-36.159199	144.162739	94.24	1.81	96.05
44	-36.159283	144.162778	94.22	1.81	96.04
45	-36.159367	144.162947	94.25	1.81	96.06
46	-36.159375	144.163170	94.33	1.81	96.14
47	-36.159428	144.163257	94.34	1.81	96.15
48	-36.159479	144.163309	94.38	1.81	96.19

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Name: PV array A_4-0m
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 3.0°
Ground Coverage Ratio: 0.3402857142857143
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159543	144.163328	94.41	2.98	97.40
2	-36.167604	144.163321	94.68	2.98	97.66
3	-36.167605	144.149709	94.59	2.98	97.58
4	-36.174777	144.149704	95.60	2.98	98.59
5	-36.174777	144.149559	95.62	2.98	98.60
6	-36.174897	144.149342	95.63	2.98	98.61
7	-36.174893	144.132386	95.73	2.98	98.71
8	-36.174920	144.132201	95.79	2.98	98.77
9	-36.174814	144.131967	95.75	2.98	98.73
10	-36.174629	144.132027	95.76	2.98	98.75
11	-36.173203	144.132015	95.63	2.98	98.61
12	-36.172509	144.132591	95.67	2.98	98.65
13	-36.172077	144.132892	95.59	2.98	98.57
14	-36.171776	144.133014	95.52	2.98	98.51
15	-36.171435	144.132997	95.53	2.98	98.51
16	-36.171232	144.132814	95.51	2.98	98.49
17	-36.170551	144.132354	95.52	2.98	98.51
18	-36.170361	144.131993	95.48	2.98	98.46
19	-36.167968	144.131974	95.60	2.98	98.58
20	-36.165131	144.131978	95.16	2.98	98.15
21	-36.164121	144.131988	94.96	2.98	97.95
22	-36.163482	144.132003	94.96	2.98	97.94
23	-36.162143	144.131970	94.87	2.98	97.86
24	-36.161429	144.131969	94.75	2.98	97.74
25	-36.160309	144.131911	94.67	2.98	97.65
26	-36.155567	144.131901	94.33	2.98	97.32
27	-36.155566	144.134376	94.16	2.98	97.17
28	-36.155521	144.135050	94.16	2.98	97.14
29	-36.155518	144.154157	93.90	2.98	96.89
30	-36.155535	144.154184	93.90	2.98	96.89
31	-36.155543	144.159156	94.13	2.98	97.11
32	-36.155517	144.159677	94.12	2.98	97.11
33	-36.155541	144.161134	93.69	2.98	96.67
34	-36.155562	144.161233	93.78	2.98	96.77
35	-36.155571	144.162005	94.08	2.98	97.06
36	-36.156346	144.162177	94.27	2.98	97.25
37	-36.157888	144.162332	94.27	2.98	97.26
38	-36.158103	144.162238	94.23	2.98	97.21
39	-36.158277	144.162313	94.22	2.98	97.21
40	-36.158424	144.162455	94.22	2.98	97.20
41	-36.158669	144.162576	94.24	2.98	97.23
42	-36.159027	144.162703	94.25	2.98	97.24
43	-36.159199	144.162739	94.24	2.98	97.22
44	-36.159283	144.162778	94.22	2.98	97.21
45	-36.159367	144.162947	94.25	2.98	97.23
46	-36.159375	144.163170	94.33	2.98	97.31
47	-36.159428	144.163257	94.34	2.98	97.32
48	-36.159479	144.163309	94.38	2.98	97.37

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Name: PV array B_2-8m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 3.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159528	144.163607	94.47	1.81	96.28
2	-36.159533	144.163826	94.34	1.81	96.15
3	-36.159553	144.163917	94.33	1.81	96.14
4	-36.159853	144.164592	94.34	1.81	96.15
5	-36.159909	144.164866	94.37	1.81	96.18
6	-36.159907	144.165006	94.39	1.81	96.20
7	-36.159693	144.166062	94.49	1.81	96.30
8	-36.159636	144.166683	94.42	1.81	96.23
9	-36.159596	144.166900	94.34	1.81	96.15
10	-36.159603	144.167143	94.39	1.81	96.20
11	-36.159653	144.167253	94.44	1.81	96.25
12	-36.159750	144.167295	94.42	1.81	96.23
13	-36.159968	144.167287	94.31	1.81	96.12
14	-36.160157	144.167257	94.22	1.81	96.03
15	-36.160334	144.167169	94.21	1.81	96.02
16	-36.160434	144.167070	94.19	1.81	96.00
17	-36.160502	144.166937	94.19	1.81	96.00
18	-36.160512	144.166839	94.20	1.81	96.01
19	-36.160477	144.166749	94.21	1.81	96.02
20	-36.160457	144.166487	94.20	1.81	96.01
21	-36.160654	144.166385	94.20	1.81	96.01
22	-36.160848	144.166360	94.19	1.81	96.00
23	-36.161107	144.166264	94.18	1.81	95.99
24	-36.161306	144.166394	94.17	1.81	95.98
25	-36.161523	144.166558	94.16	1.81	95.97
26	-36.161773	144.166614	94.15	1.81	95.96
27	-36.161934	144.166548	94.16	1.81	95.97
28	-36.161991	144.166430	94.16	1.81	95.97
29	-36.162074	144.166274	94.17	1.81	95.99
30	-36.162269	144.166258	94.17	1.81	95.98
31	-36.162541	144.166253	94.16	1.81	95.86
32	-36.162636	144.166279	94.12	1.81	95.93
33	-36.162700	144.166279	94.14	1.81	95.95
34	-36.162806	144.166249	94.16	1.81	95.97
35	-36.163195	144.166006	94.17	1.81	95.98
36	-36.163237	144.165965	94.17	1.81	95.98
37	-36.163265	144.165908	94.17	1.81	95.98
38	-36.163386	144.165724	94.15	1.81	95.96
39	-36.163629	144.165785	94.17	1.81	95.98
40	-36.163707	144.165862	94.17	1.81	95.98
41	-36.163757	144.165899	94.17	1.81	95.98
42	-36.163988	144.166026	94.17	1.81	95.98
43	-36.163971	144.166267	94.17	1.81	95.98
44	-36.163941	144.166359	94.17	1.81	95.98
45	-36.163955	144.166457	94.17	1.81	95.98
46	-36.164117	144.166852	94.18	1.81	95.99
47	-36.164522	144.167610	94.19	1.81	96.00
48	-36.164779	144.168416	94.19	1.81	96.00
49	-36.164837	144.168965	94.22	1.81	96.03
50	-36.164912	144.169571	94.39	1.81	96.20
51	-36.165079	144.170588	94.45	1.81	96.26
52	-36.165301	144.170809	94.47	1.81	96.28
53	-36.165408	144.170853	94.48	1.81	96.29
54	-36.166446	144.170809	94.81	1.81	96.62
55	-36.166587	144.170693	94.92	1.81	96.74
56	-36.167186	144.169092	94.86	1.81	96.67
57	-36.167343	144.168415	94.70	1.81	96.51
58	-36.167476	144.167636	94.64	1.81	96.45
59	-36.167575	144.167481	94.65	1.81	96.46

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Name: PV array B_4-0m
Axis tracking: Single-axis rotation
Backtracking: Shade
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 3.0°
Ground Coverage Ratio: 0.3402857142857143
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159528	144.163607	94.47	2.98	97.45
2	-36.159533	144.163826	94.34	2.98	97.33
3	-36.159553	144.163917	94.33	2.98	97.32
4	-36.159853	144.164592	94.34	2.98	97.32
5	-36.159909	144.164866	94.37	2.98	97.35
6	-36.159907	144.165006	94.39	2.98	97.37
7	-36.159693	144.166062	94.49	2.98	97.48
8	-36.159636	144.166683	94.42	2.98	97.40
9	-36.159596	144.166900	94.34	2.98	97.32
10	-36.159603	144.167143	94.39	2.98	97.37
11	-36.159653	144.167253	94.44	2.98	97.43
12	-36.159750	144.167295	94.42	2.98	97.40
13	-36.159968	144.167287	94.31	2.98	97.29
14	-36.160157	144.167257	94.22	2.98	97.21
15	-36.160334	144.167169	94.21	2.98	97.19
16	-36.160434	144.167070	94.19	2.98	97.17
17	-36.160502	144.166937	94.19	2.98	97.17
18	-36.160512	144.166839	94.20	2.98	97.18
19	-36.160477	144.166749	94.21	2.98	97.19
20	-36.160457	144.166487	94.20	2.98	97.19
21	-36.160654	144.166385	94.20	2.98	97.18
22	-36.160848	144.166360	94.19	2.98	97.17
23	-36.161107	144.166264	94.18	2.98	97.16
24	-36.161306	144.166394	94.17	2.98	97.15
25	-36.161523	144.166558	94.16	2.98	97.14
26	-36.161773	144.166614	94.15	2.98	97.14
27	-36.161934	144.166548	94.16	2.98	97.14
28	-36.161991	144.166430	94.16	2.98	97.15
29	-36.162074	144.166274	94.17	2.98	97.16
30	-36.162269	144.166258	94.17	2.98	97.15
31	-36.162541	144.166253	94.16	2.98	97.03
32	-36.162636	144.166279	94.12	2.98	97.10
33	-36.162700	144.166279	94.14	2.98	97.12
34	-36.162806	144.166249	94.16	2.98	97.15
35	-36.163195	144.166006	94.17	2.98	97.15
36	-36.163237	144.165965	94.17	2.98	97.15
37	-36.163265	144.165908	94.17	2.98	97.15
38	-36.163386	144.165724	94.15	2.98	97.14
39	-36.163629	144.165785	94.17	2.98	97.16
40	-36.163707	144.165862	94.17	2.98	97.15
41	-36.163757	144.165899	94.17	2.98	97.15
42	-36.163988	144.166026	94.17	2.98	97.15
43	-36.163971	144.166267	94.17	2.98	97.15
44	-36.163941	144.166359	94.17	2.98	97.15
45	-36.163955	144.166457	94.17	2.98	97.15
46	-36.164117	144.166852	94.18	2.98	97.16
47	-36.164522	144.167610	94.19	2.98	97.17
48	-36.164779	144.168416	94.19	2.98	97.18
49	-36.164837	144.168965	94.22	2.98	97.20
50	-36.164912	144.169571	94.39	2.98	97.37
51	-36.165079	144.170588	94.45	2.98	97.44
52	-36.165301	144.170809	94.47	2.98	97.46
53	-36.165408	144.170853	94.48	2.98	97.46
54	-36.166446	144.170809	94.81	2.98	97.80
55	-36.166587	144.170693	94.92	2.98	97.91
56	-36.167186	144.169092	94.86	2.98	97.84
57	-36.167343	144.168415	94.70	2.98	97.68
58	-36.167476	144.167636	94.64	2.98	97.62
59	-36.167575	144.167481	94.65	2.98	97.63



Route Receptors

Name: Route1_Bendigo-Pyramid Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.183986	144.131610	96.70	2.40	99.10
2	-36.182347	144.131608	96.76	2.40	99.16
3	-36.179482	144.131600	96.35	2.40	98.75
4	-36.175530	144.131599	96.08	2.40	98.48
5	-36.174954	144.131599	96.17	2.40	98.57
6	-36.174251	144.131598	96.11	2.40	98.51
7	-36.171267	144.131593	96.00	2.40	98.40
8	-36.166132	144.131582	95.74	2.40	98.14
9	-36.164667	144.131580	95.54	2.40	97.94
10	-36.162902	144.131576	95.40	2.40	97.80
11	-36.162004	144.131574	95.35	2.40	97.75
12	-36.159744	144.131569	95.25	2.40	97.65
13	-36.155378	144.131559	94.75	2.40	97.15
14	-36.152699	144.131544	94.62	2.40	97.02
15	-36.149030	144.131551	94.36	2.40	96.76
16	-36.146478	144.131543	94.42	2.40	96.82

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Name: Route2_Mologa-Durham Ox Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.155377	144.178203	94.07	2.40	96.47
2	-36.155384	144.172741	94.30	2.40	96.70
3	-36.155380	144.167575	94.65	2.40	97.05
4	-36.155384	144.166789	94.89	2.40	97.29
5	-36.155385	144.165672	94.60	2.40	97.00
6	-36.155387	144.165371	94.61	2.40	97.01
7	-36.155389	144.164212	94.69	2.40	97.09
8	-36.155389	144.163502	94.65	2.40	97.05
9	-36.155387	144.160827	94.33	2.40	96.73
10	-36.155388	144.155026	94.17	2.40	96.57
11	-36.155390	144.149715	94.58	2.40	96.98
12	-36.155389	144.140177	94.67	2.40	97.07
13	-36.155388	144.134166	94.46	2.40	96.86
14	-36.155378	144.131559	94.75	2.40	97.15

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Name: Route3_Old Church Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.155389	144.163504	94.65	2.40	97.05
2	-36.155926	144.163507	94.51	2.40	96.91
3	-36.157232	144.163522	94.43	2.40	96.83
4	-36.158359	144.163518	94.36	2.40	96.77
5	-36.158875	144.163519	94.34	2.40	96.74
6	-36.160178	144.163523	94.41	2.40	96.81
7	-36.161876	144.163524	94.36	2.40	96.76
8	-36.163721	144.163520	94.48	2.40	96.88
9	-36.165373	144.163518	94.50	2.40	96.90
10	-36.167294	144.163514	94.61	2.40	97.01
11	-36.168821	144.163514	94.71	2.40	97.11
12	-36.170997	144.163486	94.81	2.40	97.21
13	-36.175947	144.163472	95.17	2.40	97.57
14	-36.176864	144.163486	95.27	2.40	97.67

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Name: Route4_Mitiamo-Kerang Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.146460	144.159408	93.93	2.40	96.33
2	-36.149835	144.161824	94.23	2.40	96.63
3	-36.153500	144.164403	94.14	2.40	96.54
4	-36.154832	144.165389	94.44	2.40	96.84
5	-36.155148	144.165577	94.30	2.40	96.70
6	-36.155385	144.165672	94.60	2.40	97.00
7	-36.155557	144.165714	94.41	2.40	96.81
8	-36.156050	144.165978	94.07	2.40	96.47
9	-36.156317	144.166152	94.07	2.40	96.47
10	-36.156638	144.166409	94.16	2.40	96.56
11	-36.157178	144.166857	94.18	2.40	96.58
12	-36.157780	144.167480	94.16	2.40	96.56
13	-36.158345	144.168044	94.24	2.40	96.64
14	-36.158692	144.168290	94.29	2.40	96.69
15	-36.159378	144.168745	94.56	2.40	96.96
16	-36.160212	144.169363	94.45	2.40	96.85
17	-36.162017	144.170421	94.40	2.40	96.80
18	-36.162855	144.170982	94.53	2.40	96.93
19	-36.163148	144.171464	94.39	2.40	96.79
20	-36.163375	144.171748	94.38	2.40	96.78
21	-36.165694	144.173329	94.45	2.40	96.85
22	-36.166410	144.173650	94.40	2.40	96.80
23	-36.166765	144.173874	95.00	2.40	97.40
24	-36.167691	144.174518	94.33	2.40	96.73
25	-36.168789	144.175334	94.30	2.40	96.70
26	-36.170732	144.176679	94.16	2.40	96.56
27	-36.174527	144.179522	94.92	2.40	97.32
28	-36.174808	144.179845	94.91	2.40	97.31
29	-36.175230	144.180627	94.81	2.40	97.21

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Name: Route5_Prices Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.146488	144.165966	93.83	2.40	96.23
2	-36.147532	144.165969	93.86	2.40	96.26
3	-36.148858	144.165963	93.92	2.40	96.32
4	-36.150622	144.165957	93.91	2.40	96.31
5	-36.152439	144.165972	94.20	2.40	96.60
6	-36.153596	144.165961	94.00	2.40	96.40
7	-36.153876	144.165947	94.10	2.40	96.50
8	-36.154613	144.165744	94.27	2.40	96.67
9	-36.155014	144.165656	94.31	2.40	96.71
10	-36.155188	144.165594	94.39	2.40	96.79

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Name: Route6_Mologa-Durham Ox Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.152712	144.121214	94.48	2.40	96.88
2	-36.152700	144.123008	94.58	2.40	96.98
3	-36.152696	144.124631	94.49	2.40	96.89
4	-36.152697	144.127178	94.43	2.40	96.83
5	-36.152693	144.129960	94.48	2.40	96.88
6	-36.152699	144.131544	94.62	2.40	97.02

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Name: Route7_Yarrowalla East Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.182348	144.125452	96.36	2.40	98.76
2	-36.182347	144.129143	96.42	2.40	98.82
3	-36.182347	144.131608	96.76	2.40	99.16
4	-36.182339	144.131855	96.52	2.40	98.92
5	-36.182343	144.134099	96.47	2.40	98.87
6	-36.182338	144.135738	96.55	2.40	98.95
7	-36.182338	144.138088	96.54	2.40	98.94
8	-36.182343	144.140226	96.46	2.40	98.86
9	-36.182340	144.142155	96.36	2.40	98.76
10	-36.182339	144.144521	96.18	2.40	98.58
11	-36.182338	144.146538	95.58	2.40	97.98
12	-36.182342	144.150182	96.62	2.40	99.02
13	-36.182352	144.153114	95.82	2.40	98.22
14	-36.182357	144.156136	95.72	2.40	98.12

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Flight Path Receptors

Name: FP1_Pyramid Hill 00

Description:

Threshold height: 15 m

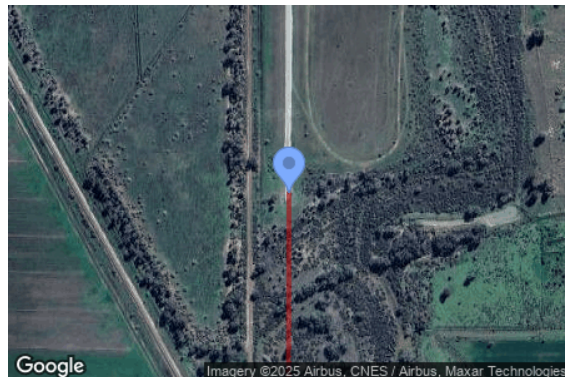
Direction: 0.2°

Glide slope: 3.0°

Pilot view restricted? Yes

Vertical view: 30.0°

Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-36.067559	144.126754	89.06	15.24	104.30
Two-mile	-36.096471	144.126647	90.79	182.20	272.99

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Name: FP2_Pyramid Hill 18

Description:

Threshold height: 15 m

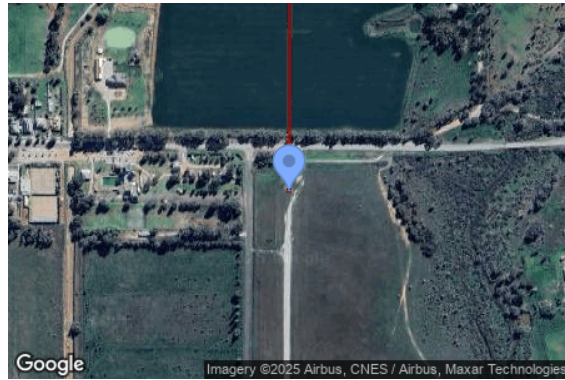
Direction: 180.2°

Glide slope: 3.0°

Pilot view restricted? Yes

Vertical view: 30.0°

Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-36.055791	144.126797	89.04	15.24	104.28
Two-mile	-36.026879	144.126922	86.79	186.18	272.97

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-36.155218	144.165162	94.35	1.50
OP 2	2	-36.161596	144.126923	95.19	1.50
OP 3	3	-36.159607	144.172394	94.75	1.50
OP 4	4	-36.180479	144.150734	95.89	1.50
OP 5	5	-36.149123	144.126522	94.48	1.50

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Glare Analysis Results

Summary of Results Glare with potential for temporary after-image predicted

PV Array	Tilt °	Orient °	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
PV array A_2-8m	SA tracking	SA tracking	108	1.8	706	11.8	-
PV array A_4-0m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_2-8m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_4-0m	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
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	108	1.8	706	11.8
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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PV: PV array A_2-8m potential temporary after-image

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route2_Mologa-Durham Ox Rd	108	1.8	706	11.8
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

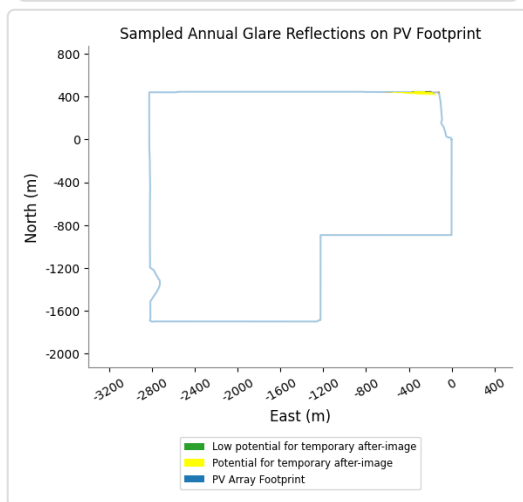
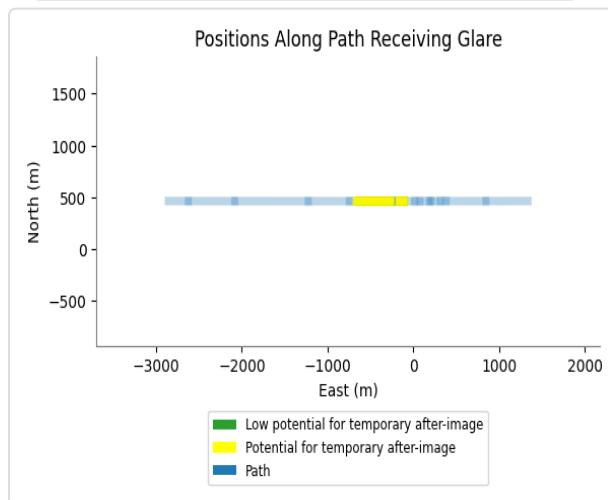
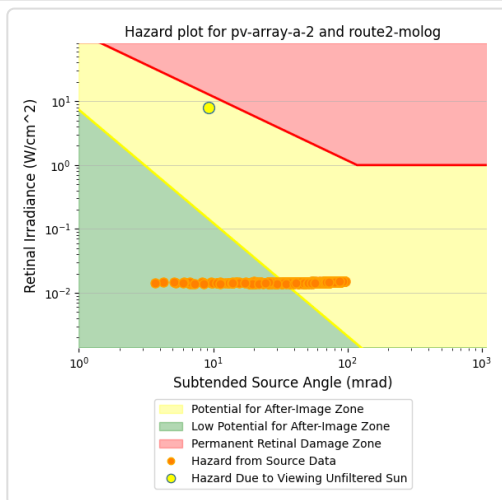
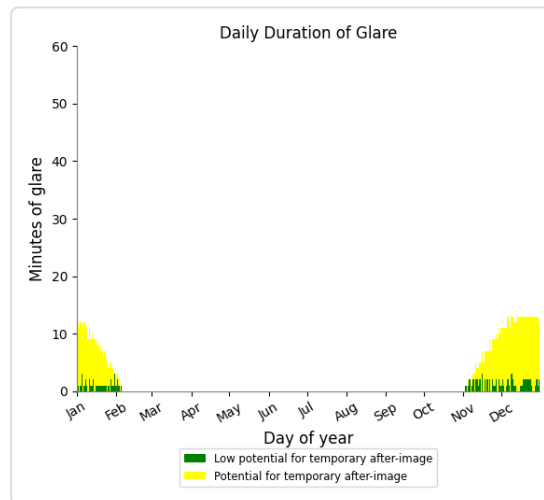
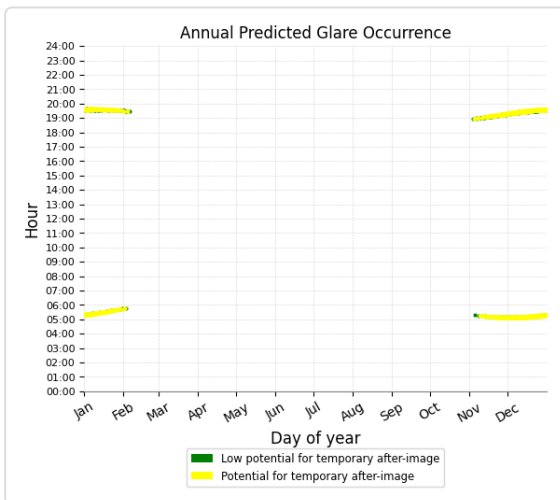
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PV array A_2-8m and Route: Route2_Mologa-Durham Ox Rd

Yellow glare: 706 min.

Green glare: 108 min.



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PV array A_2-8m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array A_2-8m and Route: Route3_Old Church Rd

No glare found

PV array A_2-8m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array A_2-8m and Route: Route5_Prices Rd

No glare found

PV array A_2-8m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array A_2-8m and Route: Route7_Yarrawalla East Rd

No glare found

PV array A_2-8m and FP: FP1_Pyramid Hill 00

No glare found

PV array A_2-8m and FP: FP2_Pyramid Hill 18

No glare found

PV array A_2-8m and OP 1

No glare found

PV array A_2-8m and OP 2

No glare found

PV array A_2-8m and OP 3

No glare found

PV array A_2-8m and OP 4

No glare found

PV array A_2-8m and OP 5

No glare found

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PV: PV array A_4-0m no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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PV array A_4-0m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array A_4-0m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array A_4-0m and Route: Route3_Old Church Rd

No glare found

PV array A_4-0m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array A_4-0m and Route: Route5_Prices Rd

No glare found

PV array A_4-0m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array A_4-0m and Route: Route7_Yarrawalla East Rd

No glare found

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PV array A_4-0m and FP: FP1_Pyramid Hill 00

No glare found

PV array A_4-0m and FP: FP2_Pyramid Hill 18

No glare found

PV array A_4-0m and OP 1

No glare found

PV array A_4-0m and OP 2

No glare found

PV array A_4-0m and OP 3

No glare found

PV array A_4-0m and OP 4

No glare found

PV array A_4-0m and OP 5

No glare found

PV: PV array B_2-8m no glare found

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Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

PV array B_2-8m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array B_2-8m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array B_2-8m and Route: Route3_Old Church Rd

No glare found

PV array B_2-8m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array B_2-8m and Route: Route5_Prices Rd

No glare found

PV array B_2-8m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array B_2-8m and Route: Route7_Yarrawalla East Rd

No glare found

PV array B_2-8m and FP: FP1_Pyramid Hill 00

No glare found

PV array B_2-8m and FP: FP2_Pyramid Hill 18

No glare found

PV array B_2-8m and OP 1

No glare found

PV array B_2-8m and OP 2

No glare found

PV array B_2-8m and OP 3

No glare found

PV array B_2-8m and OP 4

No glare found

PV array B_2-8m and OP 5

No glare found

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PV: PV array B_4-0m no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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PV array B_4-0m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array B_4-0m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array B_4-0m and Route: Route3_Old Church Rd

No glare found

PV array B_4-0m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array B_4-0m and Route: Route5_Prices Rd

No glare found

PV array B_4-0m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array B_4-0m and Route: Route7_Yarrawalla East Rd

No glare found

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PV array B_4-0m and FP: FP1_Pyramid Hill 00

No glare found

PV array B_4-0m and FP: FP2_Pyramid Hill 18

No glare found

PV array B_4-0m and OP 1

No glare found

PV array B_4-0m and OP 2

No glare found

PV array B_4-0m and OP 3

No glare found

PV array B_4-0m and OP 4

No glare found

PV array B_4-0m and OP 5

No glare found

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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

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FORGESOLAR GLARE ANALYSIS

Project: **P0058365 Mologa Solar Farm**

Site configuration: **Layout20251124A_04deg**

Created 05 Dec, 2025

Updated 05 Dec, 2025

Time-step 1 minute

Timezone offset UTC10

Minimum sun altitude 0.0 deg

DNI peaks at 1,000.0 W/m²

Category 100 MW to 1 GW

Site ID 166441.27755

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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 °	Orientation	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
PV array A_2-8m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array A_4-0m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_2-8m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_4-0m	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
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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Component Data

PV Arrays

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Name: PV array A_2-8m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 4.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159543	144.163328	94.41	1.81	96.22
2	-36.167604	144.163321	94.68	1.81	96.49
3	-36.167605	144.149709	94.59	1.81	96.41
4	-36.174777	144.149704	95.60	1.81	97.41
5	-36.174777	144.149559	95.62	1.81	97.43
6	-36.174897	144.149342	95.63	1.81	97.44
7	-36.174893	144.132386	95.73	1.81	97.54
8	-36.174920	144.132201	95.79	1.81	97.60
9	-36.174814	144.131967	95.75	1.81	97.56
10	-36.174629	144.132027	95.76	1.81	97.57
11	-36.173203	144.132015	95.63	1.81	97.44
12	-36.172509	144.132591	95.67	1.81	97.48
13	-36.172077	144.132892	95.59	1.81	97.40
14	-36.171776	144.133014	95.52	1.81	97.33
15	-36.171435	144.132997	95.53	1.81	97.34
16	-36.171232	144.132814	95.51	1.81	97.32
17	-36.170551	144.132354	95.52	1.81	97.33
18	-36.170361	144.131993	95.48	1.81	97.29
19	-36.167968	144.131974	95.60	1.81	97.41
20	-36.165131	144.131978	95.16	1.81	96.98
21	-36.164121	144.131988	94.96	1.81	96.78
22	-36.163482	144.132003	94.96	1.81	96.77
23	-36.162143	144.131970	94.87	1.81	96.68
24	-36.161429	144.131969	94.75	1.81	96.57
25	-36.160309	144.131911	94.67	1.81	96.48
26	-36.155567	144.131901	94.33	1.81	96.14
27	-36.155566	144.134576	94.16	1.81	95.99
28	-36.155521	144.135050	94.16	1.81	95.97
29	-36.155518	144.154157	93.90	1.81	95.71
30	-36.155535	144.154184	93.90	1.81	95.71
31	-36.155543	144.159156	94.13	1.81	95.94
32	-36.155517	144.159677	94.12	1.81	95.93
33	-36.155541	144.161134	93.69	1.81	95.50
34	-36.155562	144.161233	93.78	1.81	95.59
35	-36.155571	144.162005	94.08	1.81	95.89
36	-36.156346	144.162177	94.27	1.81	96.08
37	-36.157888	144.162332	94.27	1.81	96.08
38	-36.158103	144.162238	94.23	1.81	96.04
39	-36.158277	144.162313	94.22	1.81	96.04
40	-36.158424	144.162455	94.22	1.81	96.03
41	-36.158669	144.162576	94.24	1.81	96.06
42	-36.159027	144.162703	94.25	1.81	96.07
43	-36.159199	144.162739	94.24	1.81	96.05
44	-36.159283	144.162778	94.22	1.81	96.04
45	-36.159367	144.162947	94.25	1.81	96.06
46	-36.159375	144.163170	94.33	1.81	96.14
47	-36.159428	144.163257	94.34	1.81	96.15
48	-36.159479	144.163309	94.38	1.81	96.19

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Name: PV array A_4-0m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 4.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159543	144.163328	94.41	2.98	97.40
2	-36.167604	144.163321	94.68	2.98	97.66
3	-36.167605	144.149709	94.59	2.98	97.58
4	-36.174777	144.149704	95.60	2.98	98.59
5	-36.174777	144.149559	95.62	2.98	98.60
6	-36.174897	144.149342	95.63	2.98	98.61
7	-36.174893	144.132386	95.73	2.98	98.71
8	-36.174920	144.132201	95.79	2.98	98.77
9	-36.174814	144.131967	95.75	2.98	98.73
10	-36.174629	144.132027	95.76	2.98	98.75
11	-36.173203	144.132015	95.63	2.98	98.61
12	-36.172509	144.132591	95.67	2.98	98.65
13	-36.172077	144.132892	95.59	2.98	98.57
14	-36.171776	144.133014	95.52	2.98	98.51
15	-36.171435	144.132997	95.53	2.98	98.51
16	-36.171232	144.132814	95.51	2.98	98.49
17	-36.170551	144.132354	95.52	2.98	98.51
18	-36.170361	144.131993	95.48	2.98	98.46
19	-36.167968	144.131974	95.60	2.98	98.58
20	-36.165131	144.131978	95.16	2.98	98.15
21	-36.164121	144.131988	94.96	2.98	97.95
22	-36.163482	144.132003	94.96	2.98	97.94
23	-36.162143	144.131970	94.87	2.98	97.86
24	-36.161429	144.131969	94.75	2.98	97.74
25	-36.160309	144.131911	94.67	2.98	97.65
26	-36.155567	144.131901	94.33	2.98	97.32
27	-36.155566	144.134376	94.16	2.98	97.17
28	-36.155521	144.135050	94.16	2.98	97.14
29	-36.155518	144.154157	93.90	2.98	96.89
30	-36.155535	144.154184	93.90	2.98	96.89
31	-36.155543	144.159156	94.13	2.98	97.11
32	-36.155517	144.159677	94.12	2.98	97.11
33	-36.155541	144.161134	93.69	2.98	96.67
34	-36.155562	144.161233	93.78	2.98	96.77
35	-36.155571	144.162005	94.08	2.98	97.06
36	-36.156346	144.162177	94.27	2.98	97.25
37	-36.157888	144.162332	94.27	2.98	97.26
38	-36.158103	144.162238	94.23	2.98	97.21
39	-36.158277	144.162313	94.22	2.98	97.21
40	-36.158424	144.162455	94.22	2.98	97.20
41	-36.158669	144.162576	94.24	2.98	97.23
42	-36.159027	144.162703	94.25	2.98	97.24
43	-36.159199	144.162739	94.24	2.98	97.22
44	-36.159283	144.162778	94.22	2.98	97.21
45	-36.159367	144.162947	94.25	2.98	97.23
46	-36.159375	144.163170	94.33	2.98	97.31
47	-36.159428	144.163257	94.34	2.98	97.32
48	-36.159479	144.163309	94.38	2.98	97.37

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PLAN

Name: PV array B_2-8m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 4.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.159528	144.163607	94.47	1.81	96.28
2	-36.159533	144.163826	94.34	1.81	96.15
3	-36.159553	144.163917	94.33	1.81	96.14
4	-36.159853	144.164592	94.34	1.81	96.15
5	-36.159909	144.164866	94.37	1.81	96.18
6	-36.159907	144.165006	94.39	1.81	96.20
7	-36.159693	144.166062	94.49	1.81	96.30
8	-36.159636	144.166683	94.42	1.81	96.23
9	-36.159596	144.166900	94.34	1.81	96.15
10	-36.159603	144.167143	94.39	1.81	96.20
11	-36.159653	144.167253	94.44	1.81	96.25
12	-36.159750	144.167295	94.42	1.81	96.23
13	-36.159968	144.167287	94.31	1.81	96.12
14	-36.160157	144.167257	94.22	1.81	96.03
15	-36.160334	144.167169	94.21	1.81	96.02
16	-36.160434	144.167070	94.19	1.81	96.00
17	-36.160502	144.166937	94.19	1.81	96.00
18	-36.160512	144.166839	94.20	1.81	96.01
19	-36.160477	144.166749	94.21	1.81	96.02
20	-36.160457	144.166487	94.20	1.81	96.01
21	-36.160654	144.166385	94.20	1.81	96.01
22	-36.160848	144.166360	94.19	1.81	96.00
23	-36.161107	144.166264	94.18	1.81	95.99
24	-36.161306	144.166394	94.17	1.81	95.98
25	-36.161523	144.166558	94.16	1.81	95.97
26	-36.161773	144.166614	94.15	1.81	95.96
27	-36.161934	144.166548	94.16	1.81	95.97
28	-36.161991	144.166430	94.16	1.81	95.97
29	-36.162074	144.166274	94.17	1.81	95.99
30	-36.162269	144.166258	94.17	1.81	95.98
31	-36.162541	144.166253	94.16	1.81	95.86
32	-36.162636	144.166279	94.12	1.81	95.93
33	-36.162700	144.166279	94.14	1.81	95.95
34	-36.162806	144.166249	94.16	1.81	95.97
35	-36.163195	144.166006	94.17	1.81	95.98
36	-36.163237	144.165965	94.17	1.81	95.98
37	-36.163265	144.165908	94.17	1.81	95.98
38	-36.163386	144.165724	94.15	1.81	95.96
39	-36.163629	144.165785	94.17	1.81	95.98
40	-36.163707	144.165862	94.17	1.81	95.98
41	-36.163757	144.165899	94.17	1.81	95.98
42	-36.163988	144.166026	94.17	1.81	95.98
43	-36.163971	144.166267	94.17	1.81	95.98
44	-36.163941	144.166359	94.17	1.81	95.98
45	-36.163955	144.166457	94.17	1.81	95.98
46	-36.164117	144.166852	94.18	1.81	95.99
47	-36.164522	144.167610	94.19	1.81	96.00
48	-36.164779	144.168416	94.19	1.81	96.00
49	-36.164837	144.168965	94.22	1.81	96.03
50	-36.164912	144.169571	94.39	1.81	96.20
51	-36.165079	144.170588	94.45	1.81	96.26
52	-36.165301	144.170809	94.47	1.81	96.28
53	-36.165408	144.170853	94.48	1.81	96.29
54	-36.166446	144.170809	94.81	1.81	96.62
55	-36.166587	144.170693	94.92	1.81	96.74
56	-36.167186	144.169092	94.86	1.81	96.67
57	-36.167343	144.168415	94.70	1.81	96.51
58	-36.167476	144.167636	94.64	1.81	96.45
59	-36.167575	144.167481	94.65	1.81	96.46

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Name: PV array B_4-0m

Axis tracking: Single-axis rotation

Backtracking: Shade

Tracking axis orientation: 0.0°

Max tracking angle: 60.0°

Resting angle: 4.0°

Ground Coverage Ratio: 0.3402857142857143

Rated power: -

Panel material: Smooth glass with AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



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1	-36.159528	144.163607	94.47	2.98	97.45
2	-36.159533	144.163826	94.34	2.98	97.33
3	-36.159553	144.163917	94.33	2.98	97.32
4	-36.159853	144.164592	94.34	2.98	97.32
5	-36.159909	144.164866	94.37	2.98	97.35
6	-36.159907	144.165006	94.39	2.98	97.37
7	-36.159693	144.166062	94.49	2.98	97.48
8	-36.159636	144.166683	94.42	2.98	97.40
9	-36.159596	144.166900	94.34	2.98	97.32
10	-36.159603	144.167143	94.39	2.98	97.37
11	-36.159653	144.167253	94.44	2.98	97.43
12	-36.159750	144.167295	94.42	2.98	97.40
13	-36.159968	144.167287	94.31	2.98	97.29
14	-36.160157	144.167257	94.22	2.98	97.21
15	-36.160334	144.167169	94.21	2.98	97.19
16	-36.160434	144.167070	94.19	2.98	97.17
17	-36.160502	144.166937	94.19	2.98	97.17
18	-36.160512	144.166839	94.20	2.98	97.18
19	-36.160477	144.166749	94.21	2.98	97.19
20	-36.160457	144.166487	94.20	2.98	97.19
21	-36.160654	144.166385	94.20	2.98	97.18
22	-36.160848	144.166360	94.19	2.98	97.17
23	-36.161107	144.166264	94.18	2.98	97.16
24	-36.161306	144.166394	94.17	2.98	97.15
25	-36.161523	144.166558	94.16	2.98	97.14
26	-36.161773	144.166614	94.15	2.98	97.14
27	-36.161934	144.166548	94.16	2.98	97.14
28	-36.161991	144.166430	94.16	2.98	97.15
29	-36.162074	144.166274	94.17	2.98	97.16
30	-36.162269	144.166258	94.17	2.98	97.15
31	-36.162541	144.166253	94.16	2.98	97.03
32	-36.162636	144.166279	94.12	2.98	97.10
33	-36.162700	144.166279	94.14	2.98	97.12
34	-36.162806	144.166249	94.16	2.98	97.15
35	-36.163195	144.166006	94.17	2.98	97.15
36	-36.163237	144.165965	94.17	2.98	97.15
37	-36.163265	144.165908	94.17	2.98	97.15
38	-36.163386	144.165724	94.15	2.98	97.14
39	-36.163629	144.165785	94.17	2.98	97.16
40	-36.163707	144.165862	94.17	2.98	97.15
41	-36.163757	144.165899	94.17	2.98	97.15
42	-36.163988	144.166026	94.17	2.98	97.15
43	-36.163971	144.166267	94.17	2.98	97.15
44	-36.163941	144.166359	94.17	2.98	97.15
45	-36.163955	144.166457	94.17	2.98	97.15
46	-36.164117	144.166852	94.18	2.98	97.16
47	-36.164522	144.167610	94.19	2.98	97.17
48	-36.164779	144.168416	94.19	2.98	97.18
49	-36.164837	144.168965	94.22	2.98	97.20
50	-36.164912	144.169571	94.39	2.98	97.37
51	-36.165079	144.170588	94.45	2.98	97.44
52	-36.165301	144.170809	94.47	2.98	97.46
53	-36.165408	144.170853	94.48	2.98	97.46
54	-36.166446	144.170809	94.81	2.98	97.80
55	-36.166587	144.170693	94.92	2.98	97.91
56	-36.167186	144.169092	94.86	2.98	97.84
57	-36.167343	144.168415	94.70	2.98	97.68
58	-36.167476	144.167636	94.64	2.98	97.62
59	-36.167575	144.167481	94.65	2.98	97.63

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Route Receptors

Name: Route1_Bendigo-Pyramid Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.183986	144.131610	96.70	2.40	99.10
2	-36.182347	144.131608	96.76	2.40	99.16
3	-36.179482	144.131600	96.35	2.40	98.75
4	-36.175530	144.131599	96.08	2.40	98.48
5	-36.174954	144.131599	96.17	2.40	98.57
6	-36.174251	144.131598	96.11	2.40	98.51
7	-36.171267	144.131593	96.00	2.40	98.40
8	-36.166132	144.131582	95.74	2.40	98.14
9	-36.164667	144.131580	95.54	2.40	97.94
10	-36.162902	144.131576	95.40	2.40	97.80
11	-36.162004	144.131574	95.35	2.40	97.75
12	-36.159744	144.131569	95.25	2.40	97.65
13	-36.155378	144.131559	94.75	2.40	97.15
14	-36.152699	144.131544	94.62	2.40	97.02
15	-36.149030	144.131551	94.36	2.40	96.76
16	-36.146478	144.131543	94.42	2.40	96.82

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Name: Route2_Mologa-Durham Ox Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.155377	144.178203	94.07	2.40	96.47
2	-36.155384	144.172741	94.30	2.40	96.70
3	-36.155380	144.167575	94.65	2.40	97.05
4	-36.155384	144.166789	94.89	2.40	97.29
5	-36.155385	144.165672	94.60	2.40	97.00
6	-36.155387	144.165371	94.61	2.40	97.01
7	-36.155389	144.164212	94.69	2.40	97.09
8	-36.155389	144.163502	94.65	2.40	97.05
9	-36.155387	144.160827	94.33	2.40	96.73
10	-36.155388	144.155026	94.17	2.40	96.57
11	-36.155390	144.149715	94.58	2.40	96.98
12	-36.155389	144.140177	94.67	2.40	97.07
13	-36.155388	144.134166	94.46	2.40	96.86
14	-36.155378	144.131559	94.75	2.40	97.15

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Name: Route3_Old Church Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.155389	144.163504	94.65	2.40	97.05
2	-36.155926	144.163507	94.51	2.40	96.91
3	-36.157232	144.163522	94.43	2.40	96.83
4	-36.158359	144.163518	94.36	2.40	96.77
5	-36.158875	144.163519	94.34	2.40	96.74
6	-36.160178	144.163523	94.41	2.40	96.81
7	-36.161876	144.163524	94.36	2.40	96.76
8	-36.163721	144.163520	94.48	2.40	96.88
9	-36.165373	144.163518	94.50	2.40	96.90
10	-36.167294	144.163514	94.61	2.40	97.01
11	-36.168821	144.163514	94.71	2.40	97.11
12	-36.170997	144.163486	94.81	2.40	97.21
13	-36.175947	144.163472	95.17	2.40	97.57
14	-36.176864	144.163486	95.27	2.40	97.67

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Name: Route4_Mitiamo-Kerang Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.146460	144.159408	93.93	2.40	96.33
2	-36.149835	144.161824	94.23	2.40	96.63
3	-36.153500	144.164403	94.14	2.40	96.54
4	-36.154832	144.165389	94.44	2.40	96.84
5	-36.155148	144.165577	94.30	2.40	96.70
6	-36.155385	144.165672	94.60	2.40	97.00
7	-36.155557	144.165714	94.41	2.40	96.81
8	-36.156050	144.165978	94.07	2.40	96.47
9	-36.156317	144.166152	94.07	2.40	96.47
10	-36.156638	144.166409	94.16	2.40	96.56
11	-36.157178	144.166857	94.18	2.40	96.58
12	-36.157780	144.167480	94.16	2.40	96.56
13	-36.158345	144.168044	94.24	2.40	96.64
14	-36.158692	144.168290	94.29	2.40	96.69
15	-36.159378	144.168745	94.56	2.40	96.96
16	-36.160212	144.169363	94.45	2.40	96.85
17	-36.162017	144.170421	94.40	2.40	96.80
18	-36.162855	144.170982	94.53	2.40	96.93
19	-36.163148	144.171464	94.39	2.40	96.79
20	-36.163375	144.171748	94.38	2.40	96.78
21	-36.165694	144.173329	94.45	2.40	96.85
22	-36.166410	144.173650	94.40	2.40	96.80
23	-36.166765	144.173874	95.00	2.40	97.40
24	-36.167691	144.174518	94.33	2.40	96.73
25	-36.168789	144.175334	94.30	2.40	96.70
26	-36.170732	144.176679	94.16	2.40	96.56
27	-36.174527	144.179522	94.92	2.40	97.32
28	-36.174808	144.179845	94.91	2.40	97.31
29	-36.175230	144.180627	94.81	2.40	97.21

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Name: Route5_Prices Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.146488	144.165966	93.83	2.40	96.23
2	-36.147532	144.165969	93.86	2.40	96.26
3	-36.148858	144.165963	93.92	2.40	96.32
4	-36.150622	144.165957	93.91	2.40	96.31
5	-36.152439	144.165972	94.20	2.40	96.60
6	-36.153596	144.165961	94.00	2.40	96.40
7	-36.153876	144.165947	94.10	2.40	96.50
8	-36.154613	144.165744	94.27	2.40	96.67
9	-36.155014	144.165656	94.31	2.40	96.71
10	-36.155188	144.165594	94.39	2.40	96.79

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Name: Route6_Mologa-Durham Ox Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.152712	144.121214	94.48	2.40	96.88
2	-36.152700	144.123008	94.58	2.40	96.98
3	-36.152696	144.124631	94.49	2.40	96.89
4	-36.152697	144.127178	94.43	2.40	96.83
5	-36.152693	144.129960	94.48	2.40	96.88
6	-36.152699	144.131544	94.62	2.40	97.02

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Name: Route7_Yarrowalla East Rd

Path type: Two-way

Azimuthal view angle: 50.0°

Downward view angle: 90.0°



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-36.182348	144.125452	96.36	2.40	98.76
2	-36.182347	144.129143	96.42	2.40	98.82
3	-36.182347	144.131608	96.76	2.40	99.16
4	-36.182339	144.131855	96.52	2.40	98.92
5	-36.182343	144.134099	96.47	2.40	98.87
6	-36.182338	144.135738	96.55	2.40	98.95
7	-36.182338	144.138088	96.54	2.40	98.94
8	-36.182343	144.140226	96.46	2.40	98.86
9	-36.182340	144.142155	96.36	2.40	98.76
10	-36.182339	144.144521	96.18	2.40	98.58
11	-36.182338	144.146538	95.58	2.40	97.98
12	-36.182342	144.150182	96.62	2.40	99.02
13	-36.182352	144.153114	95.82	2.40	98.22
14	-36.182357	144.156136	95.72	2.40	98.12

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Flight Path Receptors

Name: FP1_Pyramid Hill 00

Description:

Threshold height: 15 m

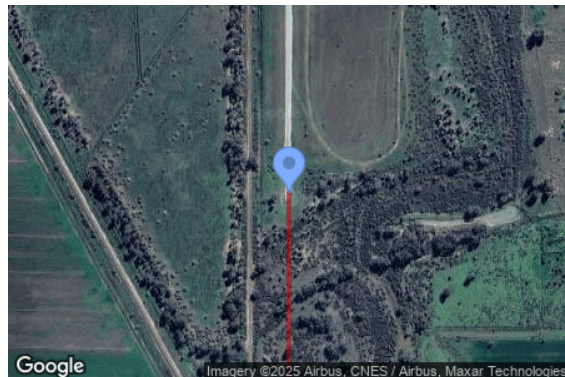
Direction: 0.2°

Glide slope: 3.0°

Pilot view restricted? Yes

Vertical view: 30.0°

Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-36.067559	144.126754	89.06	15.24	104.30
Two-mile	-36.096471	144.126647	90.79	182.20	272.99

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Name: FP2_Pyramid Hill 18

Description:

Threshold height: 15 m

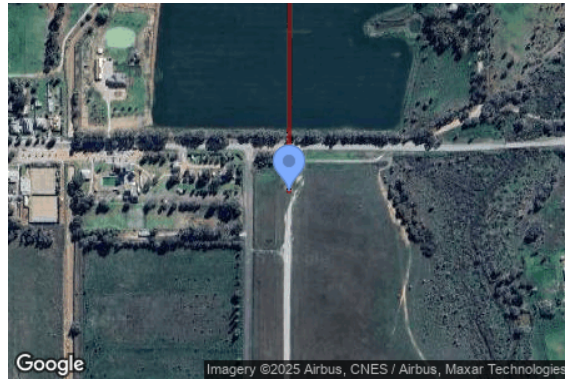
Direction: 180.2°

Glide slope: 3.0°

Pilot view restricted? Yes

Vertical view: 30.0°

Azimuthal view: 50.0°



Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-36.055791	144.126797	89.04	15.24	104.28
Two-mile	-36.026879	144.126922	86.79	186.18	272.97

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-36.155218	144.165162	94.35	1.50
OP 2	2	-36.161596	144.126923	95.19	1.50
OP 3	3	-36.159607	144.172394	94.75	1.50
OP 4	4	-36.180479	144.150734	95.89	1.50
OP 5	5	-36.149123	144.126522	94.48	1.50

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Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt °	Orient °	Annual Green Glare		Annual Yellow Glare		Energy kWh
			min	hr	min	hr	
PV array A_2-8m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array A_4-0m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_2-8m	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array B_4-0m	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
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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PV: PV array A_2-8m no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

PV array A_2-8m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array A_2-8m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array A_2-8m and Route: Route3_Old Church Rd

No glare found

PV array A_2-8m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array A_2-8m and Route: Route5_Prices Rd

No glare found

PV array A_2-8m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array A_2-8m and Route: Route7_Yarrawalla East Rd

No glare found

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PV array A_2-8m and FP: FP1_Pyramid Hill 00

No glare found

PV array A_2-8m and FP: FP2_Pyramid Hill 18

No glare found

PV array A_2-8m and OP 1

No glare found

PV array A_2-8m and OP 2

No glare found

PV array A_2-8m and OP 3

No glare found

PV array A_2-8m and OP 4

No glare found

PV array A_2-8m and OP 5

No glare found

PV: PV array A_4-0m no glare found

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Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

PV array A_4-0m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array A_4-0m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array A_4-0m and Route: Route3_Old Church Rd

No glare found

PV array A_4-0m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array A_4-0m and Route: Route5_Prices Rd

No glare found

PV array A_4-0m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array A_4-0m and Route: Route7_Yarrawalla East Rd

No glare found

PV array A_4-0m and FP: FP1_Pyramid Hill 00

No glare found

PV array A_4-0m and FP: FP2_Pyramid Hill 18

No glare found

PV array A_4-0m and OP 1

No glare found

PV array A_4-0m and OP 2

No glare found

PV array A_4-0m and OP 3

No glare found

PV array A_4-0m and OP 4

No glare found

PV array A_4-0m and OP 5

No glare found

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PV: PV array B_2-8m no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

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PV array B_2-8m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array B_2-8m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array B_2-8m and Route: Route3_Old Church Rd

No glare found

PV array B_2-8m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array B_2-8m and Route: Route5_Prices Rd

No glare found

PV array B_2-8m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array B_2-8m and Route: Route7_Yarrawalla East Rd

No glare found

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PV array B_2-8m and FP: FP1_Pyramid Hill 00

No glare found

PV array B_2-8m and FP: FP2_Pyramid Hill 18

No glare found

PV array B_2-8m and OP 1

No glare found

PV array B_2-8m and OP 2

No glare found

PV array B_2-8m and OP 3

No glare found

PV array B_2-8m and OP 4

No glare found

PV array B_2-8m and OP 5

No glare found

PV: PV array B_4-0m no glare found

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Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Route1_Bendigo-Pyramid Rd	0	0.0	0	0.0
Route2_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route3_Old Church Rd	0	0.0	0	0.0
Route4_Mitiamo-Kerang Rd	0	0.0	0	0.0
Route5_Prices Rd	0	0.0	0	0.0
Route6_Mologa-Durham Ox Rd	0	0.0	0	0.0
Route7_Yarrawalla East Rd	0	0.0	0	0.0
FP1_Pyramid Hill 00	0	0.0	0	0.0
FP2_Pyramid Hill 18	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

PV array B_4-0m and Route: Route1_Bendigo-Pyramid Rd

No glare found

PV array B_4-0m and Route: Route2_Mologa-Durham Ox Rd

No glare found

PV array B_4-0m and Route: Route3_Old Church Rd

No glare found

PV array B_4-0m and Route: Route4_Mitiamo-Kerang Rd

No glare found

PV array B_4-0m and Route: Route5_Prices Rd

No glare found

PV array B_4-0m and Route: Route6_Mologa-Durham Ox Rd

No glare found

PV array B_4-0m and Route: Route7_Yarrawalla East Rd

No glare found

PV array B_4-0m and FP: FP1_Pyramid Hill 00

No glare found

PV array B_4-0m and FP: FP2_Pyramid Hill 18

No glare found

PV array B_4-0m and OP 1

No glare found

PV array B_4-0m and OP 2

No glare found

PV array B_4-0m and OP 3

No glare found

PV array B_4-0m and OP 4

No glare found

PV array B_4-0m and OP 5

No glare found

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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

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