24 February 2026

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Director, Energy Assessments
Department of Planning, Housing and Infrastructure

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Dear Iwan

RE: Gundary Solar Farm (SSD-48225958) – Request for Additional Information

I refer to your request for additional information dated 4 September 2025 and updated on 26 September 2025, with a further request for information issued in January 2026. Please refer to responses below.

1. Heads of terms for a Voluntary Planning Agreement agreed with Council

Lightsource bp has continued to consult with Goulburn Mulwaree Council in terms of the Voluntary Planning Agreement and has submitted the necessary information to the Department of Planning, Housing and Infrastructure (DPHI) separately.

2. Additional agency feedback received from Transport for NSW, Goulburn Mulwaree Council, and Conservation Programs, Heritage and Regulation

Table 1, Table 2 and Table 3 responds to the feedback received from Goulburn Mulwaree Council, Conservation Programs, Heritage and Regulation (CPHR) and Transport for NSW.

Lightsource bp has continued to consult with Goulburn Mulwaree Council during the preparation of this RFI response. This involved a number of online meetings during November and December to specifically discuss the VPA and workers accommodation.

In addition, a meeting was also held with Transport for NSW on 17 November 2025 to discuss their feedback and responses provided below.

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Table 1 Response to Goulburn Mulwaree Council

Agency feedback	Response
Site suitability and unavoidable impacts The EIS itself acknowledges that the project will result in some unavoidable environmental and social impacts. Despite proposed mitigation, the documentation fails to demonstrate that the site is fundamentally suitable for a development of this scale and nature. The location's agricultural value, landscape sensitivity, and proximity to residential and environmentally sensitive areas make it inappropriate for industrial-scale solar infrastructure.	The Environmental Impact Statement (EIS) found that, while there will be some unavoidable environmental and social impacts from the Project, the extent of these has been minimised through the Project design and effective management and mitigation measures have been committed to in order to address any residual impacts. Avoidance and mitigation strategies incorporated into the Project design are summarised in Section 1.5 of the EIS with a list of the Project's updated management and mitigation measures provided in Appendix 2 of the Submissions Report. Changes to the Project has involved: • Avoiding 27.89 ha of NSW listed threatened ecological communities and 37.96 ha of Commonwealth listed ecological communities by altering the solar array layout in the central and southern parts. • Strategically locating the majority of the Development Footprint (97%) within Category 1exempt land (i.e. land cleared of native vegetation). • Removing approximately 50 ha of solar array in the north-west corner of the Project Area to minimise noise and visual impacts to sensitive receivers. • Relocating the centralised BESS approximately 1.2 km to the east and away from sensitive receivers located on the northwest, to reduce noise and visual impacts. • Incorporating noise attenuation (i.e. barriers) around noisy equipment to reduce operational noise impacts. • Strategically locating landscape screening to minimise glint and glare and visual impacts. • Avoiding placement of project infrastructure within flood prone areas and designing solar panels with a 500 mm freeboard for the lowest edge above the maximum 1% AEP flood event. • Installation of riparian fencing (such as a latched tube watercourse crossing) where the security fence crosses a watercourse or creek. • Inclusion of dedicated non-combustible water tanks with a combined capacity of 180,000 L distributed throughout the Project Area. • Incorporating setback distances, namely: ○ 10 m APZ around the perimeter of the Project, within the security fencing.

Agency feedback	Response
	○ Approximately 20 m to 40 m setbacks around second order and higher streams, in particular where these have been assessed as having biodiversity value. The EIS further identified that the Project is located on land zoned RU1 Primary Production where solar farms are permitted with consent and impacts to the rural residential amenity have been assessed in accordance with the NSW Large-scale Solar Guideline and found to be manageable with the implementation of a range of management and mitigation measures. It is noted that Council's strategic planning documents specifically promote renewable energy projects for the region, particularly where these: • Do not compete for land identified as being of prime crop and pasture potential. • Have access to the existing electricity network. As identified in the EIS, the Project is located in an area with good available solar resource, on land and soil capability (LSC) Class 3 to 6 land and has ready access to the existing electricity network. Through the proposed on-site grid connection, the Project avoids the need to construct additional connection infrastructure outside of the Project Area, such as high voltage (HV) transmission lines and substations. As such, the Project's ability to have an onsite grid connection would avoid any additional environmental, social and cultural impacts to several neighbouring landholders associated with the construction of grid connection infrastructure. Moreover, the proximity of load centres means that less energy is lost in the transportation of the generated energy so more can be used rather than wasted. The Soil and Agriculture Assessment (Appendix 10 of the EIS) determined that the Project Area is mostly poor to moderate agricultural land, with approximately 63 ha verified as Class 3 and the remaining 639 ha ranging from Class 4 to 6. No part of the Project Area is mapped as Biophysical Strategic Agricultural Land (BSAL), State Significant Agricultural Land or critical industry clusters (CICs). The existing land use within and surrounding the Project Area further provides the opportunity to implement agrisolar (sheep grazing). The Project would not result in permanent changes to agricultural land use or productivity, as it is expected that the Project Area would be returned to agriculture following decommissioning. Sheep grazing may also continue on the Project Area once construction has been completed to mitigate any temporary agricultural productivity impacts of the land. The available solar resources, combined with proximity to the transmission line and the current land use make the location suitable for a productive solar farm.
Loss of agricultural land	The majority of the Project Area has been verified though the Soil and Agriculture Impact Assessment (SAIA) as land and soil capability (LSC) Class 4, 5 and 6 (covering a total of 636 ha)

Agency feedback	Response
The site comprises productive farmland with historical and economic significance. The proposed development represents a permanent shift away from agricultural use, contrary to local land use planning objectives.	with approximately 63 ha of the Project Area being verified as LSC Class 3, of which 21 ha falls within the Development Footprint, to be covered by solar panels. Due to the nature of the Project which will require only localised and sporadic landform modification including minor soil stripping (for excavation works and leveling), impacts on LSC during the construction phase are expected to be minor. Following the end of life for the Project (approximately 40 years), disturbance areas will be re-graded (where required), and any minor stockpiles of topsoil and subsoil be respread over disturbed areas and rehabilitated with either native vegetation or improved pastures depending on the intended final land use. This strategy, along with good soil management practices (as outlined in Section 6.7.5 of the EIS) will facilitate the rehabilitation in returning the land to an equivalent LSC class. Therefore, it is anticipated there will be no permanent impacts on LSC classes within the Project Area as a result of the Project. In addition, the Land Use Conflict Risk Assessment (LUCRA) (Appendix 10 of the EIS) determined that the Project would be compatible to coexist with the primarily agricultural land uses within the surrounding area and would not affect agricultural productivity in adjacent areas. The Project is reversible (it could be removed with relatively little residual impact to the landscape) and will diversify the current land use by potentially allowing ongoing agricultural activity for sheep grazing concurrently with the Project, preventing fragmentation of agricultural land in the region.
Visual and landscape impact The Gundary Plains hold cultural and scenic value. The proposed mitigation measures do not sufficiently preserve the visual integrity of the landscape, particularly for nearby residents.	The Landscape and Visual Assessment completed for the Project determined that the Project would introduce a large area of mostly low-level built structures (with repetitive, linear patterning) across open, undulating, grassed pastures, and that the Project is reversible (it could be removed with relatively little residual impact to the landscape). Therefore, the Project would not have a significant adverse impact on the landscape character of Gundary Plains. Modelling was used to visualise views from private viewpoints (residences) and public viewpoints (local roads and the Goulburn Airport), including eight key viewpoints from within Goulburn and its fringes (approximately 10 km away). With the implementation of landscape screening along sections of the perimeter fencing, the assessment indicated that the highest residual visual impact (moderate) would occur at R27. The remaining residual visual impacts would be very low to low. No high residual visual impact is predicted for any viewpoints. Further visual analysis (provided in Appendix 6 of the Submissions Report) undertaken following EIS exhibition demonstrates that additional screen planting along the western boundary of the Project (assuming a mitigation height of 7 m at approximately five years) reduces the visual

Agency feedback	Response
	impact rating for R27 to a low. This additional screen planting is shown on the updated conceptual landscape plan provided on Figure 6.3 of **Appendix A**. In addition, the landscape plan includes further screen planting around the substation to further reduce the visual impact to nearby residences.
Community wellbeing Council remains concerned about the mental health impacts on affected landholders and the broader community. The Social Impact Assessment lacks depth in addressing long-term social cohesion and wellbeing.	The Social Impact Assessment (SIA) acknowledged that mental health were raised as a growing concern for the community during the community engagement program. It is acknowledged that the Gundary community has been exposed to assessment and decision-making processes that are extending over many years, and that this can cause uncertainty for concerned community members and therefore may result in potential impacts on mental health. It should be noted that the Project does not propose that there would be displacement of any members of the community, thereby minimising physical disruption of social cohesion. Mental health, wellbeing and social cohesion within the community have been identified as key social impacts and assessed in detail in the SIA (refer to Section 4.1.2 and Section 4.5.1 of the SIA). Measures to manage and mitigate these impacts include: • **Community and Stakeholder Engagement Plan**: Lightsource bp will continue to implement the CSEP throughout the construction and operation of the Project, with regular evaluation to ensure it continues to meet its objectives. Consideration will be given to ongoing communication with host and proximal landholders and additional methods for enhancing community and connection within the locality, including the identification of new relevant stakeholders as the Project progresses. • **Neighbourhood Benefit Sharing Program**: Lightsource bp has developed a Neighbourhood Benefit Sharing Program which will be implemented should the Project be approved, and construction commences. • **A Social Impact Management Plan (SIMP):** Should the Project be approved, Lightsource bp will develop and implement a SIMP. The SIMP will document the key mitigation and enhancement commitments for the Project and include a program to monitor, review and report on the effectiveness of these actions. • **Rural Health Connect:** Lightsource bp is currently exploring partnering with Rural Health Connect.
Bushfire hazard	Since the exhibition of the EIS and Submissions Report, Lightsource bp has continued to seek ways to mitigate and manage potential bushfire risk. In addition to the bushfire mitigation

Agency feedback	Response
The site's location in a bushfire-prone area raises serious safety concerns. Council is not satisfied that the fire risk mitigation strategies are sufficient or enforceable.	measures outlined in the EIS (see Section 6.13.2 of the EIS), Lightsource bp is also committed to implement the following measures should the Project be approved: • Installation of a thermal detection camera on site during the construction phase to detect a potential fire event in the Project Area as well as the surrounding area. • Training operational staff to provide first attack firefighting response capacity for any ignition on site and additional capability for first attack on local fires outside the Project Area. • Dedicated on site firefighting equipment installed and maintained in accordance with relevant Australian Standards. These could include fire extinguishers, fire blankets, portable hand pumps or backpack water tanks and personal protective equipment (PPE). On site firefighting equipment will be confirmed during the preparation of the Bushfire Management Plan.
Noise and EMF exposure Community concerns regarding operational noise and electromagnetic radiation have not been fully addressed, and further independent review is warranted.	**Operational noise** The Project design includes the following noise attenuation to reduce operational noise impacts: • 5.5 metre high noise walls to be placed around the loudest Project infrastructure (such as the substation HV transformers), with the inside of the walls to be lined with acoustic absorption • 3 m high noise walls to be placed near the condenser units of some decentralised DC BESS PCS stations. Noise modelling indicated that there will be no operational noise impacts at any of the sensitive receivers, with the Project meeting all project noise trigger levels (35 dB) for the day, evening and night-time periods. Operational noise impact assessment is provided in Section 6.10.4.3 and Appendix 13 of the EIS. **EMF exposure** The design, selection and procurement of the electrical equipment for the Project will comply with relevant international and Australian standards for generation of and exposure to EMF. The required electrical safety standards and codes (including provision of fencing, enclosures, and physical distance) will be utilised to eliminate exposure of the general public from these sources. Furthermore, the Project layout has been designed with the proximity of nearby sensitive receivers in mind to reduce EMF to negligible to nil levels. The closest sensitive receiver is approximately 272 m north of the nearest project infrastructure (i.e. solar panels). Given the separation distances between the project infrastructure and sensitive receivers (>130 m), the expected EMF levels generated by the Project would be below the reference levels for

Agency feedback	Response
	occupational and general public exposure as defined in the International Commission on Non-Ionizing Radiation Protection (ICNIRP) published *Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz)*. The risk of impacts from EMF generated during operation of the Project would be limited.
Letter of offer Negotiations between Council and Lightsource bp in relation to the terms of the proposed Planning Agreement have not resulted in an agreed Letter of Offer to date.	Lightsource bp has continued to consult with Goulburn Mulwaree Council in terms of the Voluntary Planning Agreement and has submitted the necessary information to DPHI separately.
Oversize, over mass (OSOM) and heavy vehicle hours of operation In the event that consent is granted, delivery of oversize and/or overmass (OSOM) and any heavy vehicle or single unit truck movements should be restricted to occur outside school bus hours and school drop off times in consultation with the local bus company.	Two transportation routes from the Hume Highway to the Project Area were investigated i.e. Option 1 and Option 2. The EIS acknowledged that Option 2 was identified by Council as the preferred route as it passes mainly through rural and industrial land uses. Option 1 will provide an alternative route (outside school zone times) for delivery of large battery and substation components as it is a designated Oversize Over Mass (OSOM) route. In light of the above, the EIS included a commitment that no Project related construction traffic (heavy vehicles) will be using Option 1 during school zone hours of operation (8:00 am–9:30 am and 2:30 pm–4:00 pm on school days). Prior to the commencement of construction, a Construction Traffic Management Plan (CTMP) will be prepared in accordance with relevant guidelines and in consultation with Transport for NSW and Goulburn Mulwaree Council. The CTMP would outline how construction activities would avoid, mitigate and manage risks involving construction activities, users of the traffic and transport network and residents.
The heavy vehicle component will increase the likelihood of road pavement damage. Therefore in the event that consent is granted, it is recommended that either road maintenance contributions be sought for the local roads used as part of the haulage route in accordance with Council's adopted Local Infrastructure Contributions Plan or that the proponent enter into an agreement to undertake a preliminary dilapidation report on the roads and agree to	Dilapidation surveys covering pavement, drainage, and bridge structures will be undertaken in consultation with Tranport for NSW and Council for the proposed transport routes before and after construction. Regular inspections and consultation with Council and Lightsource bp will be undertaken. Any damage resulting from construction traffic, excluding normal wear and tear, will be repaired.

Agency feedback	Response
upgrade to the required standard and repair any accelerated damage. A detailed pavement analysis will be required by Council for local roads prior to any works commencing to establish the life and condition.	
Section 138 Roads Act 1993 application Access to the development site is proposed by an upgraded entry at the existing property entrance, 961 Windellama Road. As the majority of traffic during the construction and operational phases of the project will be to and from Goulburn, a Basic Left Turn (BAL) treatment is proposed and is considered appropriate. Safe Intersection Sight Distance (SISD) is available on each approach to the entry point. It is proposed to construct the upgraded entry at the commencement of the project to facilitate heavy vehicle turning movements. A Section 138 Roads Act 1993 application with accompanying design plans is required to be lodged with Council as the Road Authority for assessment prior to commencement of construction.	Should the Project be approved, the Proponent will apply for a Section 138 Roads Act application with Council prior to the commencement of construction.
Project Timing & Worker Accommodation While the lodged EIS acknowledged there would be some unavoidable impacts, there are two key changes to the proposed project that will increase the impact on the Goulburn Mulwaree LGA. 1. The change to the timing of the project; and 2. The reduced local employment target from 35% to 5%. Information that Council have provided to other projects in respect to accommodation shortages includes:	Umwelt has updated the Accommodation and Employment Strategy (AES) completed for the Project as part of the EIS in line with Council's feedback. Refer to **Appendix B** for the Addendum AES. The Addendum AES incorporates updated information about project timing, local employment targets, cumulative impacts from concurrent projects, and temporary accommodation supply. In summary, the Addendum AES investigated: • **Cumulative workforce timings**: Since the preparation of the AES multiple projects in the local area have been delayed. It is estimated that a cumulative peak construction workforce of approximately 1,250 people may occur in Q3 2027, assuming all projects are approved. These projects would likely include the Woodlawn Energy Recovery Centre, Wattle Creek Energy Hub, Merino Solar Farm, and Gundary Solar Farm.

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Consideration must be given to times when locally significant events in Goulburn or surrounds are taking place that rely heavily on the availability of accommodation.
A number of regular events can fill all existing accommodation.
Council is concerned that Goulburn is likely to experience a number of SSD developments entering the construction phase at once, substantially increasing the risk of losing all available short-term accommodation to projects not necessarily in our LGA.
There should also be consideration given to regular accommodation users such as healthcare workers, ARTC, Essential Energy and other civil contractors and trades.

Suggested mitigation measures that have been provided to other proponents include the funding of a local coordination role (modelled on 'Orange360' - cited as a useful precedent for workforce and accommodation coordination in regional areas) for accommodation and event scheduling. This regional coordination role could be jointly or solely funded by approved SSD projects. This role could be embedded in an existing body, such as the Canberra Region Joint Organisation, or Regional Development Australia Southern NSW and ACT, or established as a new initiative, to proactively manage cumulative social and workforce impacts across affected LGAs.
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Local Community events: The local area hosts a range of events, including both weekly/monthly events, ad hoc events and large annual events. An indicative calendar of annual events has been developed that shows the LGA hosts a number of large annual events, primarily from October through to April, with fewer events occurring during the winter months.
Accommodation supply: Indicative supply for traditional short term accommodation and sharing economy accommodation has investigated two scenarios, i.e. one a more collective scenario of all accommodation capacity within a 1-hour drive distance radius of the Project (Scenario 1) and consideration of the same radius, excluding accommodation options within the Goulburn Mulwaree LGA (Scenario 2). In Scenario 1 there is an estimated 2,699 rooms, while in Scenario 2 there is an estimated 2,198. Both scenarios consider relative occupancy rates across traditional short term accommodation and sharing economy accommodation.
Revised accommodation options: As shown in the table below, the incoming workforce has been distribution across the relevant scenarios, reflecting the supply distribution of short term accommodation. This approach seeks to not overcrowd one area.

<table>
<tr><th rowspan="2">LGA</th><th colspan="2">Accommodation supply</th><th>Incoming workforce</th></tr>
<tr><td>Number of rooms</td><td>% of supply</td><td>Number of workers</td></tr>
<tr><td colspan="4">Scenario 1</td></tr>
<tr><td>Goulburn-Mulwaree</td><td>501</td><td>18.6%</td><td>44</td></tr>
<tr><td>Upper Lachlan</td><td>165</td><td>6.1%</td><td>15</td></tr>
<tr><td>Wingecarribee</td><td>1,433</td><td>53.1%</td><td>126</td></tr>
<tr><td>Yass Valley</td><td>121</td><td>8.6%</td><td>20</td></tr>
<tr><td>Queanbeyan-Palerang</td><td>368</td><td>13.6%</td><td>32</td></tr>
<tr><td colspan="4">Scenario 2</td></tr>
<tr><td>Upper Lachlan</td><td>165</td><td>7.5%</td><td>18</td></tr>
<tr><td>Wingecarribee</td><td>1,433</td><td>65.2%</td><td>155</td></tr>
<tr><td>Yass Valley</td><td>232</td><td>10.6%</td><td>25</td></tr>
<tr><td>Queanbeyan-Palerang</td><td>368</td><td>16.7%</td><td>40</td></tr>
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Agency feedback	Response

	• **Reducing cumulative impacts**: Should cumulative demand issues arise, the following considerations would assist in alleviating strain on the current short-term accommodation market:
	  ○ Support for a local accommodation coordinator
	  ○ Consideration of key event timing
	  ○ Avoidance of accommodation options within the Goulburn-Mulwaree LGA
	  ○ Utilisation of Canberra (if and as needed).
	Lightsource bp met with Goulburn Mulwaree Council on 11 December 2025 to discuss Council's feedback on the worker accommodation and provide a brief overview of the approach to the Addendum AES and key findings.

Table 2 Response to Conservation Programs, Heritage and Regulation

Agency feedback	Response
***Keyacris scurra* habitat rehabilitation** The development footprint has avoided direct impacts to the *Keyacris scurra* habitat identified onsite. However, the proposed change in land use surrounding this area poses a risk of indirect and prescribed impacts. The BMP should include measures to minimise and mitigate the risk of further degradation from occurring due to these potential impacts.	It is noted that the Biodiversity Management Plan (BMP), listed in Section 7.1 and Appendix 2 of the EIS to form part of the Project's Environmental Management Strategy (EMS), will be developed in consultation with and to the satisfaction of Conservation Programs, Heritage and Regulation (CPHR). The BMP will include measures to minimise and mitigate the risk of further degradation from occurring due to potential indirect and prescribed impacts to *Keyacris scurra* habitat identified within the site.
Prescribed impacts to the White-fronted Chat (WFC) Section 4.1.1 of the Submissions Report concludes that a prescribed impact to WFC will not occur; however, this lacks adequate justification. No evidence is presented that indicates the thistle on site is not being used as foraging or breeding habitat by the species. Therefore, a prescribed impact under Clause 6.1(1)(a)(iv) of the Biodiversity Conservation Regulation 2017 remains applicable. The BMP must include the mitigation measures for the species identified in the Submissions Report to address the risk of a prescribed impact. An assessment of thistle extent within the development footprint and targeted bird surveys during WFC breeding season are necessary to determine the actual impact on the species resulting from the development and whether a prescribed impact is to occur. These measures were previously recommended by CPHR in previous communications on 25/07/23 and 10/12/24 but have not been incorporated. This information can be included in the BMP.	To minimise impacts to the white-fronted chats, mitigation measures included in the BMP will include: • An assessment of thistle extent within the development footprint and • Targeted bird surveys during WFC breeding season (i.e. September to November) to determine the actual impact on the species resulting from the development and whether a prescribed impact is to occur.
Flooding Based on the information presented in the FIRA, it appears there might be some confusion in the estimation and use of flood warning times given that there are no gauges within the Gundary Creek catchment and no official Bureau of	In light of CHPR's feedback, Lightsource bp has committed to use severe weather warnings or extreme rainfalls forecast within the project area as the trigger for flood response including for plant operations.

Agency feedback	Response
Meteorology (BOM) flood warnings being issued at the project location. This may impact how the proposed emergency response planning is implemented, specifically the decision to shut down plant equipment and electrical infrastructure. The 8-hour flood warning time in the FIRA from the onset of heavy rainfall to flood reaching its peak or the 6 to 9-hour travel time for Mulwaree River to reach Goulburn (as referenced by WRM from the 2022 Goulburn Floodplain Risk Management Study and Plan (FRMSP) by GRCHydro) is an incorrect interpretation by WRM. As the project area is located within the upper reaches of Mulwaree River catchment, the travel time for onset flood on the site will be much quicker than the adopted FRMSP, which is measured from a gauge located downstream of the project area (The Towers gauge ID 2122725). As the waterways within the project area are not subject to any official flood warnings issued by the Bureau, it is unlikely that there would be adequate warning time for the plant operator to respond and react. Therefore, it is recommended that the trigger used for flood response including trigger for plant operations should be determined by the severe weather warnings or extreme rainfalls forecast within the project area which may lead to effective response times in the proposed flood emergency management plan in the FIRA. The emergency plan should recognise that response times are important however forecast rainfalls from severe weather warnings may be significantly different to actual rainfall and resultant flood levels on the site and access roads to the site.	
As detailed in the previous advice (10/12/24 - DOC24/993692), the substation platform appears to be located within a floodway area. This will impact the flow behaviour and cause damages to the infrastructure and therefore should be resolved in the FIRA in the event it cannot be resolved by design and requires relocation. It is assumed	Flood modelling completed for the FIRA raised the pad elevation for the substation above the PMF event (as discussed in Section 5 and Section 6 of the FIRA and shown on Figure 6.3 of the FIRA) to ensure the surface of the pad remains flood-free.

Agency feedback	Response

that further work will be required during the detailed design stage as indicated in the FIRA. The design should allow for the conveyance of water around the substation rather than through it to ensure that the impact of the floodway and flood behaviour on the substation is addressed. The impact of the proposed substation in the floodway to the flood behaviour should therefore be resolved to enable the consent authority to be satisfied the substation will not fail due to inundation or cause adverse impacts including erosion.	The proposed mitigation measures to safeguard the substation from flooding and maintain natural flood behaviour are:
	• Substation pad to be constructed above 667.7 mAHD (which is above the PMF level for that area of the site.)
	• Stream diversion:
	  ○ The 1st order stream, currently running through the substation pad, will be diverted to the east side of the pad. This diversion will be designed with appropriate drainage channels and erosion control systems to ensure stable conveyance of flow without causing scour or erosion.
	  ○ The 2nd order stream, which crosses the western corner of the substation pad, will be slightly diverted further west. This adjustment will similarly incorporate engineered drainage and erosion protection.
	• These diversions result in the initial flooded or wet areas on the pad during a PMF scenario are effectively drained and dried ensuring the pad is immune to flooding at a PMF event.
	Additionally, where practical, it is typical when designing the substation and other key electrical buildings and components that they are installed on raised concrete plinths or steel platforms to further ensure against flood damage. Given these controls, Lightsource bp conclude that maintaining the current substation location is appropriate and does not pose a significant flood risk. Therefore, relocation of the substation pad is not required.

The FIRA does not address the consequence of flooding to power shutdown including the implication on other critical utilities such as telecommunication and the impacts to the community through a loss of power. It is therefore necessary for DPHI to consider whether the design should be re-assessed through the detailed design stage as proposed, however it is advisable that the robustness of power plant operation avoids the need for shutdown.	By combining fast detection, automatic isolation, proper earthing and clearances, and coordinated protection schemes with the network, solar farms and electricity generators can safely disconnect during outages and avoid sending destabilizing power back into a weak or faulted system, thus preventing cascading failures elsewhere. The benefit to having a large, decentralised electricity network is that when one generator is unable to provide power, the electricity can be sourced from elsewhere. For the Gundary Facility, a localized flooding event should not cause a widespread power loss unless flooding impacts other key network assets,

Agency feedback	Response
	such as substations or transmission lines outside the project footprint, that are critical to the broader grid's operation. However, for the reasons mentioned in the prior response, such an event is not probable.
The flood levels in the existing and proposed scenarios should be included in the FIRA to enable a design that is informed by an understanding of flood risks and approval processes that are robust for the infrastructure and the community. The outstanding shortfalls in the FIRA makes determination by the approval authority difficult and may present issues for the proponent to meet design requirements at the proposed later detailed design stage.	Flood maps for existing conditions under the 1% AEP, 10% AEP, 5% AEP, 0.5% AEP, 0.2% AEP and PMF event have been provided in Appendix A of the FIRA. Appendix B of the FIRA contains the flood maps for developed conditions under the same flood events and Appendix C contains flood maps showing the impacts of the Project under those flood events.
On the issue of public safety risks associated with flood isolation as previously raised in agency advice (10/12/24 - DOC24/993692), the FIRA has also determined that the operation will be monitored and controlled remotely from an offsite operations centre 24 hours a day. No staff is expected to be onsite unless to undertake maintenance works and inspection activities, which will be scheduled only during business hours. The planning determination authority should satisfy itself that the risk to public safety including risks to future workers and operators of the site are therefore adequately addressed.	In addition to the remote operation of the site, with staff only on site during maintenance and inspection activities, Lightsource bp has also committed to developing and implementing a Flood Emergency Management Plan (FEMP). The FEMP will be developed in consultation with NSW SES and DPHI following project approval and prior to commencement of construction and will include, but not be limited to the following: • Identify flood risk triggers to be guided by extreme weather warnings from the Bureau of Meteorology (BOM). • Procedure for notification of staff that may be at risk from flooding. • Identify evacuation route/s. The flood assessment confirmed that flood evacuation routes are achievable for the Project without placing additional burden on emergency services. • Evacuation routes will be identified and planned following detailed design, taking account of the zones of flood hazard shown in Appendix B of the FIRA. • Roles and Responsibilities. • Emergency Action Plan and Procedures. Flood emergency management procedures and training will be provided to all staff and management working at the site. A formalised induction will also be required for new members.

Table 3 Response to Transport for NSW (TfNSW)

No	Agency feedback	Response
1	f – OPEN – Bridge assessments still have not been provided. For TfNSW assets these can be provided by SPU. See advisory note.	Bridge assessments have been requested from TfNSW in November 2025 and are in progress (TfNSW reference is PT3059).
	h – OPEN – The Port Kembla Route incorrectly identifies the height restriction at the University Bridge. This is posted as 4.9metres on the bridge however the route study notes this as a 5.2m clearance, see Attachment 2. The proponent is to ensure that the vehicle will pass safely. If required investigation of lowering for the movement is to undertaken. The proponent will also need to ensure bridge assessments are completed for the route. The Port Botany route includes a number of bridges that assessments have not been provided. The proponent is also to provide a full assessment of clearance issues along the route to ensure there are no discrepancies as identified above. Once complete, the proponent is to revise their routes to ensure they have accounted for updated assessment and completed bridge assessments.	The Route Analysis completed by ARES has been updated in response to TfNSW's feedback. Refer to **Appendix C** for the updated Route Analysis. The updated Route Analysis now references the posted clearance of the University Bridge as 4.9m. ARES further notes that the trailer will be hydraulically lowered with approximately 100mm to achieve the additional clearance required to safely pass the bridge.
	i – OPEN – The provided swept paths demonstrate the following road structures will be impacted: <u>Botany Route</u> Median on Botany Rd being crossed to make turn into Bumborah Point Rd Median at the corner of Bunnerong Rd and Botany Rd/ on Bunnerong Rd Median on Kent Rd being crossed to make turn Median at Corner of Braidwood and Bungonia <u>Kembla Route</u> Median and Corner of M1 and Picton Rd	Swept paths for the following intersections have been updated (provided in **Appendix C**) to no longer impact road infrastructure: • Corner of M1 and Picton Rd • Corner of Braidwood Rd and Sloane Str. Strategic designs have been prepared by BG&E for the remaining intersections and are provided in **Appendix C**.

No	Agency feedback	Response
	Median at Corner of Braidwood and Sloane Median at Corner of Braidwood and Bungonia. TfNSW will not support high-risk OSOM traversing state road infrastructure (medians, roundabouts, traffic islands etc) due to the risk of damage to this infrastructure. The revised TIA is to provide alternative swept paths with differing vehicle configuration or strategic concept designs that identify the scope of roadworks, pavement strengthening, or modifications to the state road infrastructure (e.g., roundabouts, medians, traffic islands, pedestrian refuges) for locations where high-risk OSOM swept paths indicate high-risk OSOM traversing the state road infrastructure. *Note: Examples of road upgrades and modifications to this type of infrastructure include pavement strengthening (asphalt), removal or partial removal of the infrastructure, and removal and replacement with a suitable alternative that complies with Austroads and TfNSW requirements. (See Attachment 2)*	
2	a – PARTIALLY ADDRESSED - Proponent is to clearly label raw data for the intersection of Braidwood/Bungonia and Braidwood/Sloane in the appendix.	An updated Traffic Impact Assessment (TIA) is provided in **Appendix C**. Data labels have been provided to traffic count data provided in the appendices of the updated TIA. Furthermore, electronic files will be provided to TfNSW as requested.
	b – OPEN – Table 5.2 has not been updated to demonstrate the hourly traffic.	Proposed hourly construction traffic generation of the Project has been estimated and provided in Section 4.2.2 of the updated TIA provided in **Appendix C**.
	c – OPEN – Turning volumes provided in the appendix however the volumes of the growth rate applied background traffic and the Gundary Solar Farm traffic have not been plotted. Further to this point, two routes are currently identified within Goulburn to accommodate the project construction traffic, within s3.1-Road network within the TIA prepared by TTPP	The distribution of Project related traffic is provided as an additional appendix in the updated TIA (refer to Appendix C of **Appendix C**). With regard to the two transportation routes, the assessment provided in the updated TIA has assumed that 100% of construction traffic (excluding worker trips) will travel to and from the site via Option 1 (north via Sydney Road) or 100% via Option 2 (from the south via Hume Street). Worker traffic distributions will be the same for Option 1 and 2.

No	Agency feedback	Response
	(dated 17 June 2025), both routes will use Sloane Street, Braidwood Rd, Bungoria Rd, however, it isn't clear how the traffic will be distributed at each of these intersections based on the chosen route (i.e will all traffic turn left or right at these intersections or be evenly distributed) if both routes are used for project traffic. TfNSW requests that the revised TIA include the direction and distribution of project traffic that will use each route in the AM/PM peak hours at the intersections with the state road network. The traffic and SIDRA analysis is to be revised based on the confirmed traffic distribution for each route in the AM/PM peak hour.	
	d - OPEN – SIDRA outputs have been provided however there appears to be discrepancies in the output provided. The 2027 Base SIDRA analysis for Braidwood Rd South East indicates a Level of Service of Service of F, however the 2027 Base plus Gundary Solar Farm South East Braidwood Rd indicates a Level of Service of B. The proponent is to clarify this discrepancy and ensure that the data for all intersections is correct and mitigation measures reflect the outcomes of the analysis. Please provide the electronic SIDRA files in the response to TfNSW.	All SIDRA intersection files have been updated with the adjusted traffic generation and distributions arising. Refer to Section 5.5 and Appendix B of the updated TIA provided in **Appendix C**. Electronic files will be provided to TfNSW as requested.
	E - CLOSED - A growth rate of 2% per annum has been applied to the surveyed 2023 data. The proponent is to ensure the analysis provided considers a worse case scenario of the network background AM and PM peaks occurring at the same time as the Gundary construction project data. Proponent is to consider offsetting start times as a mitigation measure to reducing impacts to the urban roads around Goulburn.	The growth rate of 2% pa has been maintained in the updated SIDRA analysis. The Project proposes to restrict construction traffic using Option 1 during school hours to avoid potential conflicts with School traffic along the Sydney Road route.
	f- OPEN – Proponent is to confirm and clearly label the raw traffic data for the intersection of Bungonia/Braidwood	Data labels have been provided to traffic count data provided in Appendix B of the updated TIA (see **Appendix C**).

No	Agency feedback	Response
	and Braidwood/Sloane St that has been used in the intersection analysis.	
3	PARTIALLY ADDRESSED – Pending electronic SIDRA files being provided: TfNSW notes that turning volumes and routes for light vehicles/heavy vehicles/shuttle buses should be focused to reduce the impact on the state road network, particularly on the intersections of Braidwood/Sloane St and along Braidwood Rd.	The distribution of Project related traffic types is in Appendix C of the updated TIA (see **Appendix C**). Electronic files will be provided to TfNSW as requested.

3. Confirmation of location(s) of temporary roadworks identified in the Traffic Impact Assessment and evidence of consultation with the relevant council(s)

Minor temporary treatments will be required at various intersections, as outlined in Table 4 below, to cater for OSOM vehicle movements along the Project's transport route. The Project proposes to use transport routes from Port Botany (Route 1) and Port Kembla (Route 2) on the approved NSW OSOM Load Carrying Vehicles Network map, which are commonly used to take OSOM components out of either Sydney or Wollongong and onto the Hume Highway.

From the Hume Highway at Goulburn, there are two options to get onto Windellama Road, i.e. a northern (Option 1) and a southern (Option 2) option, both of which have been assessed in the OSOM Route Study.

Table 4 Potential OSOM Intersection Treatments

Location	Council	Anticipated works required
Botany Rd/Bumborah Point Rd	Randwick City Council	Requires removal of ~167 m^2 of medians and temporary pavement installation, with clearance checks for streetlights and overhead power lines. Refer to **Appendix C** for the route survey and strategic designs.
Bunnerong Rd/Botany Rd	Randwick City Council	Requires ~145 m^2 of kerb/median modifications, temporary pit adjustments, and clearance checks for multiple overhead powerlines. Refer to **Appendix C** for the route survey and strategic designs.
Kent Rd/Gardeners Rd	Bayside Council	Requires ~86 m^2 of kerb/median modifications, temporary pit reconfiguration, and clearance checks for overhanging signage and VMS structures. Refer to **Appendix C** for the route survey and strategic designs.
Braidwood Rd/Bungonia Rd	Goulburn Mulwaree Council	Requires ~57 m^2 of median removal and clearance checks for a single overhead power line. Refer to **Appendix C** for the route survey and strategic designs.
Sydney Rd/Union St	Goulburn Mulwaree Council	A traffic light in the central median will need to be relocated, along with a road sign. Refer to **Appendix C** for the route survey and strategic designs.
Sloan St/Braidwood Rd	Goulburn Mulwaree Council	The rear of the trailer will mount the concrete traffic island, but no modifications are required. Refer to **Appendix C** for the route survey.
Windellama Rd and Site Entrance	Goulburn Mulwaree Council	Requires ~70m2 hardstand area on the inside corner. Refer to **Appendix C** for the route survey.

Option 1 between the Hume Highway and Bungonia Road is an approved and designated OSOM vehicle route. Option 1 would therefore be utilised for OSOM vehicle movements, namely 10 vehicle trips (two way) throughout the construction phase of the Project. OSOM deliveries via Option 1 would be undertaken with appropriate traffic management measures, including but not limited to, the usage of pilot vehicles, warning signage, and/or lights.

The route survey (**Appendix C**) also identified a hardstand area (approximately 50 m^2) required on the corner of Garroorigang Rd and Sloane St, specifically on the south side of Garrorigang Rd. This location is along Option 2 which ***will not be utilised*** for OSOM movements.

Lightsource bp is in the process of consulting with the relevant Councils and will provide the outcomes of this consultation to DPHI in due course.

3. Updated glint and glare assessment to account for all glare impacts (including green glare), consistent with the Large-Scale Solar Guideline

The updated Glint and Glare Assessment undertaken by Moir is provided in **Appendix D**.

4. A dwelling entitlement impact assessment in accordance with Appendix C of the Large Scale Solar Guideline accounting for all relevant dwelling entitlements.

The dwelling entitlement impact assessment is provided in **Appendix E.**

5. Further information around construction noise impacts including the specific duration of any proposed exceedances, and any proposed mitigation in accordance with the Interim Construction Noise Guideline (ICNG).

The predicated construction noise levels for each daytime activity (Scenario 1 to 7) are summarised in Table 5 below. Receivers that may experience a construction noise exceedance have been divided into two groups, namely:

- Those located towards the east, being R4, R5, R6, R7, R8, R9 and R10.
- Those located towards the west, being R16A, R16B, R16C, R20, R21A, R21B, R22, R25, R27, R29, R30, R31, R79 and R90.

Table 5 Receivers Exceeding Day Time Construction NML, LAeq (15min), dB(A)

Construction scenarios and indicative timing	Sc 1 - Site establishment	Sc 2 - Piling & foundations	Sc 3 - Assembly of equipment	Sc 4 - Underground cabling	Sc 5 - Commissioning	Sc 6 - Site rehabilitation	Sc 7 - Primary access upgrade
	Month 1 to 6	Month 6 to 21	Month 11 to 22	Month 9 to 16	Month 17 to 28	Month 24 to 30	Month 1
Receivers on the east							
R4	**53**	**48**	**46**	43	43	43	<20
R5	**48**	43	41	38	38	38	<20
R6	**51**	**46**	44	41	41	41	<20
R7	**49**	44	42	39	39	39	<20
R8	**49**	44	42	39	39	39	21
R9	**64**	**59**	**57**	**54**	**54**	**54**	20
R10	**47**	42	40	37	37	37	27
Indicative duration of exceedance to the east	*Up to 4 weeks, spread out over Month 1 to Month 6*	*Up to 6 weeks, spread out over Month 6 to Month 21*	*Up to 8 weeks, spread out over Month 11 to Month 22*	*Up to 4 weeks, spread out over Month 9 to Month 16*	*Up to 6 weeks, spread out over Month 17 to Month 28*	*Up to 4 weeks, spread out over Month 24 to Month 30*	*Not applicable*
Receivers on the west							
R16A	**49**	44	42	39	39	39	41
R16B	**49**	44	42	39	39	39	41
R16C	**51**	**46**	44	41	41	41	40
R20	**52**	**47**	45	42	42	42	**48**
R21A	**56**	**51**	**49**	**46**	**46**	**46**	**52**
R21B	**56**	**51**	**49**	**46**	**46**	**46**	**52**
R22	**64**	**59**	**57**	**54**	**54**	**54**	**46**
R25	**60**	**55**	**53**	**50**	**50**	**50**	**46**
R27	**50**	45	43	40	40	40	28

Construction scenarios and indicative timing	Sc 1 - Site establishment	Sc 2 - Piling & foundations	Sc 3 - Assembly of equipment	Sc 4 - Underground cabling	Sc 5 - Commissioning	Sc 6 - Site rehabilitation	Sc 7 - Primary access upgrade
	Month 1 to 6	**Month 6 to 21**	**Month 11 to 22**	**Month 9 to 16**	**Month 17 to 28**	**Month 24 to 30**	**Month 1**
R29	**47**	42	40	37	37	37	38
R30	**48**	43	41	38	38	38	44
R31	**48**	43	41	38	38	38	40
R79	**46**	41	39	36	36	36	**48**
R90	**46**	41	39	36	36	36	28
Indicative duration of exceedance to the west	*Up to 4 weeks, spread out over Month 1 to Month 6*	*Up to 6 weeks, spread out over Month 6 to Month 21*	*Up to 8 weeks, spread out over Month 11 to Month 22*	*Up to 4 weeks, spread out over Month 9 to Month 16*	*Up to 6 weeks, spread out over Month 17 to Month 28*	*Up to 4 weeks, spread out over Month 24 to Month 30*	*Up to 4 weeks, during Month 1*

Table 5 shows the following:

- A total of 21 non-associated receivers would exceed the 45 dB(A) noise-affected management level (NML) during the construction period, ranging from 1 dBA(A) to 19 dBA(A).
- No receiver is predicted to be 'highly noise affected' (i.e. in accordance with the Interim Construction Noise Guideline (ICNG), exposed to noise levels greater than 75 dB(A)).
- Scenario 1 will be the loudest activity with all 21 non-associated receivers predicted to exceed the NML, with 2 of those predicted to experience a noise level of up to 64 dB(A). Of these, 11 receivers (R5, R7, R8, R10, R16A, R16B, R27, R29, R30, R31 and R90) are predicted to exceed the NML during Scenario 1 only, with no exceedances predicted during the remainder of the construction period. Three of these receivers (R10, R29 and R90) would experience a 1 to 2 dB(A) exceedance, which is generally considered difficult for most people to detect.
- Four receivers (R21A, R21B, R22 and R25) are predicted to experience noise exceedances during all construction scenarios, with R21A and R21B predicted to have a 1dB(A) exceedance only during Scenarios 4, 5 and 6. One receiver (R9) is predicted to experience noise exceedances during Scenarios 1 to 6.

The construction activities will have varying noise impacts on the receivers, with the most significant effects during Scenario 1 which will occur over Month 1 to 6.

From **Table 5**, it is concluded that R21A, R21B, R22 and R25 would experience noise levels of above the NML for a total period of approximately 9 months spread out over the entire construction period of 30 months.

In this regard, the Proponent is committed to stage, where practical, Scenarios 2, 3, 4, 5 and 6 where these are predicted to exceed the NML for R9, R21A, R21B, R22 and R25 to provide respite and ensure that the noise activities are spread out over the construction period, therefore not occurring within a consecutive 9 month period.

Additional noise mitigation measures in line with the ICNG to be implemented during construction of the Project will include:

- All sensitive receivers likely to be affected will be notified at least 7 days prior to commencement of any works associated with the activity that may have an adverse impact. The notification will include:
    - details of the Project
    - the construction period and construction hours
    - contact information for Project management staff
    - complaint and incident reporting
    - how to obtain further information.
- All employees, contractors and subcontractors will receive an environmental induction. The induction must include at a minimum, all applicable mitigation measures; hours of works; any limitations on high noise-generating activities; location of nearest sensitive receivers; designated parking areas; relevant approval conditions and incident procedures.
- Contractors will keep noise to a minimum, including limiting the use of loud stereos/radios, shouting on site and car door slams.

- The noise levels of plant and equipment will have operating Sound Power or Sound Pressure Levels consistent with those nominated in the NIA.
- Noise emitting plant will be directed away from sensitive receivers and to be throttled down or shut down when not in use.
- Non-tonal reversing beepers will be fitted and used on all construction vehicles and mobile plant used regularly on site and for any out of hours work.
- The use of engine compression brakes will be limited.
- Construction will be carried out during the standard daytime working hours as practical. Work generating high noise will be scheduled during less sensitive time periods.
- The Environmental Management Strategy (EMS) will regularly be updated to account for any changes in noise management of the Project.
- Where practical, loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers.

6. Provide an assessment of flood risk in accordance with Guideline LU01 - Flood Impact and Risk Assessment (Section 3) including consideration of any potential impacts on the network and with reference to advice from Conservation Programs, Heritage and Regulation

The Flood Impact and Risk Assessment (FIRA), 2024 prepared by WRM in support of the EIS has been undertaken in line with the *Flood Impact and Risk Assessment Guideline LU01*. Subsequent the exhibition of the EIS, the FIRA was updated in 2025 to address feedback from NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) Conservation Programs, Heritage and Regulation NSW (CPHR) in relation to the 2024 FIRA (refer to Appendix E of the 2025 FIRA).

Further responses to CPHR's feedback regarding flooding is provided in Table 2 above.

7. Final project figure (development footprint included) & landscape plan aligned with final development footprint per the amendment

See **Appendix F**.

8. Updated visual assessment of R27

See **Appendix A**.

9. Clarify whether emergency egress onto adjoining properties is proposed and required, and if consultation with affected properties has occurred

Upon further review, emergency egress onto adjoining non-associated properties is no longer proposed. Lightsource bp will directly contact these landholders to let them know of the proposed changes, and the reasoning for this.

There will still be provision for some emergency egress points along the boundaries shared with neighbouring properties owned by the host landholder. These properties are located along the western and southern boundaries, as well as the boundary shared with R4 (on the east). The exact placement of the emergency egress points are yet to be confirmed subject to ongoing discussions with the host landholder and RFS/FRNSW. In addition to the bushfire mitigation measures outlined in the EIS, Lightsource bp has also committed to implement the following measures should the Project be approved:

- Installation of a thermal detection camera on site during the construction phase to detect a potential fire event in the Project Area as well as the surrounding area.
- Training operational staff to provide first attack firefighting response capacity for any ignition on site and additional capability for first attack on local fires outside the Project Area.
- Dedicated on site firefighting equipment installed and maintained in accordance with relevant Australian Standards. These could include fire extinguishers, fire blankets, portable hand pumps or backpack water tanks and personal protective equipment (PPE). On site firefighting equipment will be confirmed during the preparation of the Bushfire Management Plan.

Consultation with RFS and FRNSW regarding the emergency egress and additional bushfire measures are still underway. Outcomes of this consultation will be provided to DPHI in due course.

10. Clarification of the discrepancy between recommended uptake of available accommodation (313 rooms) and anticipated peak construction personnel (250 personnel)

An updated Accommodation Strategy is provided in **Appendix B**.

11. Anticipated peak hourly heavy vehicle movements

Proposed peak hourly construction traffic generation of the Project has been estimated and provided in Section 4.2.2 of the updated TIA provided in **Appendix C**.

12. MW generation in (AC)

Generation capacity for the site is 320MWac at the point of connection.

13. Updated TIA and findings incorporated within RFI response

See response in Table 3 and **Appendix C** of this RFI response.

14. Consultation outcomes with NSW RFS (including Goulburn Fire Control Centre) noting updated emergency egress locations and additional proposed mitigation measures

See response to Item 9.

15. Updated project layout figure including noise wall details (location and heights)

See **Appendix F**.

16. Landowners Consent from all relevant Councils for any works required along the OSOM route

As noted in Item 3 above, Lightsource bp is in the process of consulting with the relevant Councils and will provide the outcomes of this consultation to DPHI in due course.

17. Emergency access routes from emergency egress locations, including evidence of physical and legal access onto the public road network

See response to Item 9.

18. Updated AES 'Cumulative Projects' section which aligns Gundary Solar Construction commencement Source/Assumption (Table 2.1) with figure 2.1 Cumulative Projects Indicative Construction Time Frames and 2.2 Estimated Cumulative Construction Workforce Size

See **Appendix B**.

Appendix A Visual Assessment

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Gundary Solar Farm: Response to DPHI's Request for Information (RFI) regarding landscape & visual impacts

11 December 2025	Attention: Marion O'Neill, UMWELT
Reference 18922 rev03	Author: Stacey Brodbeck, Envisage Consulting

1. Introduction

This memorandum prepared by Envisage Consulting Pty Ltd for Umwelt Australia Pty Ltd responds to requests for information (RFI) from the Department of Planning, Housing and Infrastructure (DPHI) related to the landscape and visual impact assessment component of the environmental impact assessment of the proposed Gundary Solar Farm (the Project).

The full Landscape and Visual Impact Assessment (LVIA) was issued by Envisage Consulting on 10 October 2024 (revision 6) under DPHI's *Large-Scale Solar Energy Guideline Technical Supplement for Landscape Character and Visual Impact Assessment* (August 2022, referred to as the *'Technical Supplement'*) and the Large-Scale Solar Energy Guideline (August 2022). Both documents were superseded in November 2024 by the current version (version 1.1). This RFI response is based on the 2024 documents.

The DPHI's RFI requested that the following three aspects be addressed:

- A dwelling entitlement impact assessment (including for six properties within the Rosedale subdivision)
- A detailed analysis of the visual impact R27 (a private dwelling) to determine if further mitigation is required
- Refinement of the draft landscape plan in the LVIA to respond to outcomes of the above two points.

Each of these are subsequently discussed.

2. Assessment of visual impacts to dwelling entitlements (DEs)

The DPHI's RFI specifically requested: *a dwelling entitlement impact assessment in accordance with Appendix C of the Large-Scale Solar Guideline accounting for all relevant dwelling entitlements, including:*

- *consideration of the worst-case visual impacts to these potential dwellings; and*
- *a strategy to mitigate impacts to these potential dwellings, in particular relating to operational noise and visual impacts.*

DPHI identified 10 dwelling entitlements (DEs) for this further assessment, being DE1-DE10. Of those, six are within the Rosedale subdivision area (DE3-DE8). The assessment below firstly addresses the six Rosedale subdivision DEs and then the remaining DEs are assessed. Figure 1 indicates the location of all 10 DEs.

2.1 Dwelling entitlements impact assessment methodology

DPHI's *Technical Supplement* describes the broad outcomes needed in a DE impact assessment in Table 8 (page 63), however, that table does not provide a detailed methodology of how to undertake that assessment. In response, the following methodology was developed for this requested assessment to ensure 'worst-case visual impacts' were evaluated:

- Preparation of a visibility map of the worst-case visibility of the Project for each DE lot, grouping potential visibility into four possible bands (refer Figure 1 and Table 1)
- Analysis of the visibility mapping results to determine possible future dwelling locations that minimise views of the Project (refer Table 2).

In addition, as requested by the DPHI, bare earth renders (BERs; refer Appendix A) were also prepared for the six Rosedale subdivision lots to facilitate a more detailed analysis of possible future dwelling locations (FRs). Notably, that request is not consistent with the *'Technical Supplement'*, as BERs are not a requirement for assessing visual impacts to DEs under that guideline.

The methodology for visibility mapping and BERs is explained further below.

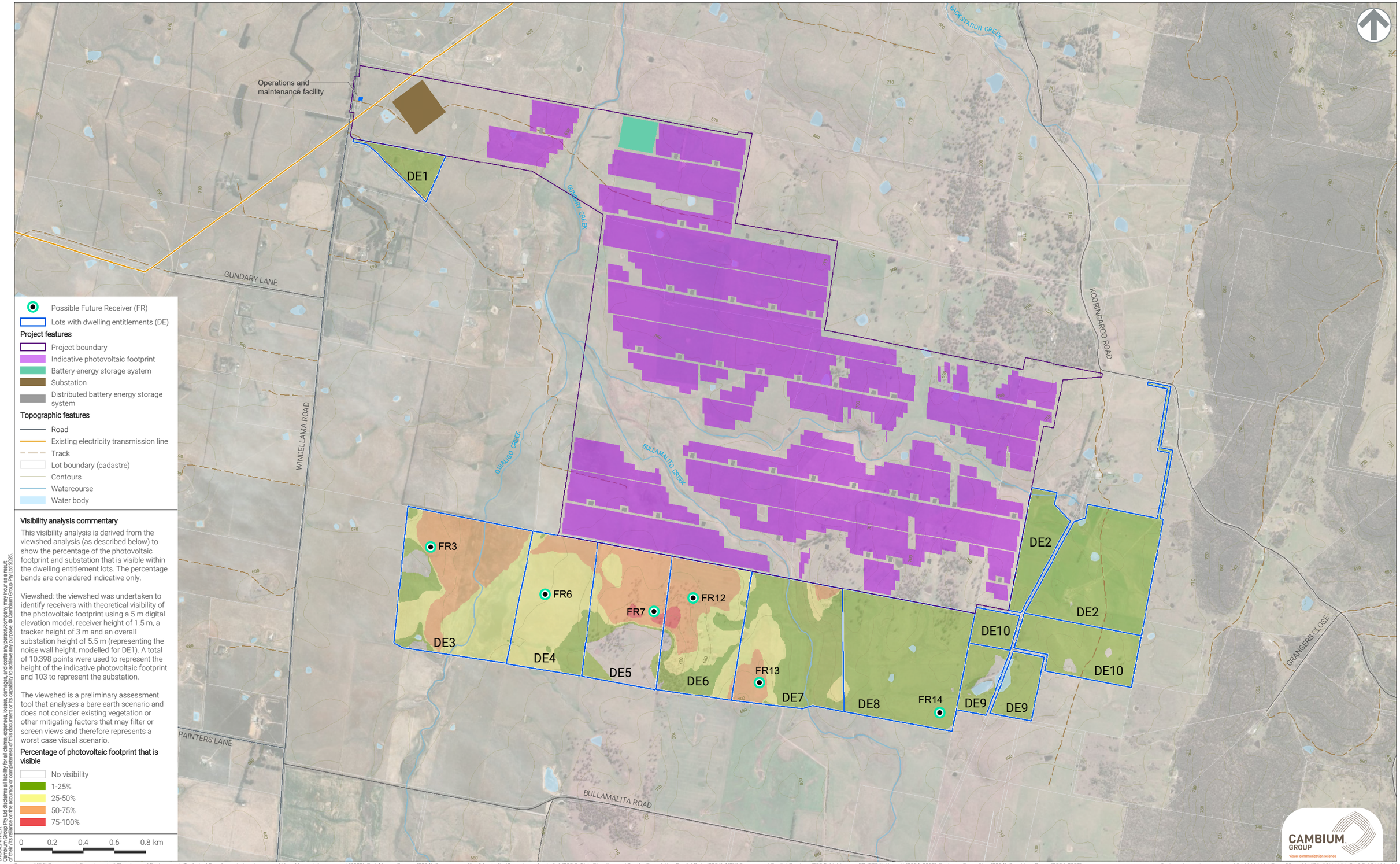
Visibility mapping

The process of visibility mapping accounts for topography and line-of-sight, however, it does not account for intervening elements such as vegetation or buildings which could obstruct views. Therefore, the projected direct line-of-sight is 'theoretical' and represents a 'worst-case' extent of the Project that could be seen.

Figure 1

Dwelling entitlement visibility analysis

GUNDARY SOLAR FARM | **LANDSCAPE AND VISUAL IMPACT ASSESSMENT**



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Source: NSW Government Department of Planning and Environment, Technical Supplement - Landscape and Visual Impact Assessment (2022), Esri, Maxar, Geoeye (2024), Commonwealth of Australia (Geoscience Australia) (2024), Elvis Elevation and Depth - Foundation Spatial Data (2024), NSW Government Spatial Services (2024), LightsourceBP (2024), Umwelt (2024, 2025), Envisage Consulting (2024), Cambium Group (2024, 2025).

Projected coordinate system GDA2020 MGA Zone 55 031273_GDY_LVIA_F1_DE_251128_v03

Table 1: Visibility of Project from dwelling entitlements (DEs)

Dwelling entitlement (DE)				Visibility of Project from lot				
Lot and DP	Dwelling entitlement number	Bare Earth Render (BER prepared if applicable)	Lot size (ha)	No visibility	1-25% visibility (between nil and about a quarter of Project visible)	25-50% visibility (between about a quarter and half of Project visible)	50-75% visibility (between about half and three-quarters of Project visible)	75-100% visibility (between about three-quarters and all of Project visible)
Lot 1/DP1238347	**DE1**		8.7	0 ha (0%)	8.6 ha (98.6%)	0 ha (0.2%)	0 ha (0.5%)	0 ha (0%)
Lot 2/DP1195626	**DE2**		66.0	0 ha (0.1%)	66 ha (99.9%)	0 ha (0%)	0 ha (0%)	0 ha (0%)
Lot 1/DP873290 (Rosedale Subdivision lot 3)	**DE3**	FR3	69.0	3 ha (4.3%)	6.8 ha (9.8%)	28.8 ha (41.8%)	30.4 ha (44.1%)	0 ha (0%)
Lot 1/DP873290 (Rosedale Subdivision lot 6)	**DE4**	FR6	39.7	0 ha (0%)	5.5 ha (13.8%)	29.6 ha (74.7%)	4.6 ha (11.5%)	0 ha (0%)
Lot 1/DP873290 (Rosedale Subdivision lot 7)	**DE5**	FR7	42.1	13.7 ha (32.5%)	5.3 ha (12.5%)	4.2 ha (10%)	17.9 ha (42.5%)	1 ha (2.5%)
Lot 1/DP873290 (Rosedale Subdivision lot 12)	**DE6**	FR12	43.2	0.9 ha (2%)	9.1 ha (21%)	14.4 ha (33.3%)	17.7 ha (40.9%)	1.2 ha (2.8%)
Lot 1/DP873290 (Rosedale Subdivision lot 13)	**DE7**	FR13	53.6	0 ha (0%)	34 ha (63.5%)	12.8 ha (23.9%)	6.7 ha (12.6%)	0 ha (0%)
Lot 1/DP873290 (Rosedale Subdivision lot 14)	**DE8**	FR14	61.3	0.1 ha (0.2%)	60.8 ha (99.2%)	0.4 ha (0.6%)	0 ha (0%)	0 ha (0%)
Lot 90/DP750018	**DE9**		20.0	2.4 ha (11.8%)	17.6 ha (88.2%)	0 ha (0%)	0 ha (0%)	0 ha (0%)
Lot 74/DP750018	**DE10**		30.7	0.8 ha (2.5%)	29.9 ha (97.5%)	0 ha (0%)	0 ha (0%)	0 ha (0%)

Table 2: Analysis of visual impact to dwelling entitlements (DEs)

	Analysis of visual impact implications to dwelling entitlement		
Dwelling entitlement number	**Lot location**	**Summary of visibility**	**Discussion of possible locations to site a future dwelling**
DE1	Lot shares boundary with Project Area south of the substation. The lot slopes toward the Project and contains little vegetation.	There is no part of the lot that would not see part of the Project, however, at most there would be a quarter of the Project seen, including the substation (which includes substantial proposed landscape screening).	A dwelling sited toward the southern corner would be the furthest from the Project (about 350m away, assuming an area for a future dwelling of up to 1-hectare). From that position there would be views of no more than a quarter of the Project (being the substation and a small part of the solar panel area). However, the lower part (up to about 5m) of the substation would be screened by proposed landscape planting at about five years post-planting, through screening situated along the substation fence and also the Project boundary. The upper parts of the substation, which are mostly lightweight structures, would remain visible.
DE2	Lot shares a boundary with Project near the south-east corner. The lot is mostly clear of trees and low-lying.	There is no part of the lot that would not see part of the Project, however, at most there would be no more than one quarter of the Project seen from any part. As the lot is quite low-lying there would not be elevated views of the Project.	A dwelling sited toward the south-east corner would be the furthest from the Project (350m away) and would not have elevated views, thereby limiting the extent of the Project seen.
DE3	The lot does not share a boundary with Project Area, being about 180m from the south-west corner at its closest. The lot is gently sloping and mostly clear of trees.	There would be no views of Project for about 3 ha (4.3%) and about 6.8 ha (nearly 10%) would have views of no more than a quarter of the Project.	A dwelling sited on the central, western side of the lot would be shielded from views of the Project by a low ridge. Alternatively, the BER for this lot shows that a dwelling sited at FR3 (on the highest point of the lot) would have a low visual impact rating.
DE4	Lot shares boundary with Project to south of the main solar panel footprint. The lot is gently sloping and mostly clear of trees.	There is no part of the lot that would not see part of the Project, with 5.5 ha (13.8%) having views of no more than one quarter of the Project.	The BER for this lot shows that a dwelling sited at FR6 would have a low visual impact rating.
DE5	Lot shares boundary with Project to south of the main solar panel footprint. The lot is gently sloping and mostly clear of trees.	There would be no views of Project for about 13.7 ha (32.5%), and about 5.3 ha (12.5%) would have views of up to a quarter of the Project.	A dwelling sited on the southern portion (almost a third) of the lot would be shielded by a low ridge from views of the Project. Alternatively, the BER for this lot shows that a dwelling sited at FR7 (on the highest point of the lot) would have a moderate visual impact rating, however, the lot contains a substantial number of trees and it is likely that those trees would reduce the visual impact rating from location FR7.
DE6	Lot shares boundary with Project to south of the main solar panel footprint. The lot is gently sloping and contains a substantial number of trees.	There is almost 1 ha that would not see part of the Project, and about 9 ha (21%) would see no more than a quarter of the Project.	There is almost 1 ha from where the Project would not be seen although that location is very close to the western boundary and where there are many trees. The BER for this lot shows that a dwelling sited at FR12 would have a high visual impact rating, however, the lot contains a substantial number of trees and it is likely that those trees would reduce the visual impact rating from location FR12.
DE7	Lot shares boundary with Project to south of the main solar panel footprint. The lot is gently sloping and contains a substantial number of trees.	There is effectively no part of the lot from where there would be no views of the Project, however, about two thirds of the lot (34ha or 63.5%) would see no more than a quarter of the Project.	The BER for this lot shows that a dwelling sited at FR13 (on the highest point of the lot) would have a moderate visual impact rating.
DE8	Lot shares a boundary with Project to the south of the main solar panel footprint.	There is effectively no part of the lot from where there would be no views of the Project, however, all of the lot (60.8 ha) would see no more than a quarter of the Project. The lot is also quite low-lying so views would not be as elevated as most other lots.	The BER for this lot shows that a dwelling sited at FR14 (the furthest location from the Project) would have a low visual impact rating.
DE9	Lot shares boundary with Project in south-east corner of the main solar panel footprint. The lot has some rows of trees and is low-lying.	There is almost 2.5 ha (11.8%) of the lot from where there would be no views of the Project, and the remainder of the lot (about 17.6 ha) would see no more than a quarter of the Project.	A dwelling sited near the centre of the lot would have no views of the Project, however, it is possible that this location could be subject to flooding.
DE10	Lot does not share a boundary with Project, being located about 300m to the south-east corner of the main solar panel footprint. The lot is sloping with few trees.	There is almost 0.8 ha (2.5%) of the lot from where there would be no views of the Project (spread over two locations), and the remainder of the lot (about 29.9 ha) would see no more than a quarter of the Project.	A dwelling sited on the eastern half of the lot would be the furthest from the Project (about 700m away) and have limited views of it if sited to include one of the locations from where there would be no views.

Bare earth renders (BERs)

BERs are simulated images of a 180-degree view from a selected viewpoint, however, BERs do not account for obstructions such as existing vegetation or structures and therefore represent a 'worst-case' visual scenario of the extent of the Project seen from a particular viewpoint. The BERs are presented in **Appendix A** as a set of three 180-degree simulated images: an existing BER; a BER of the Project overlain with the 'visual magnitude grid tool'; and, a BER of the Project on its own. When preparing BERs under the *Technical Supplement* it is necessary to identify a 'viewpoint sensitivity' rating which then contributes to ascertaining a visual impact level. That viewpoint sensitivity is specified in Table 2 (page 25) based on viewpoint type. That table, however, does not specify a viewpoint sensitivity where there is no dwelling present as occurs for the Rosedale lots.

Notably, the previous version of the *Technical Supplement* (2022, which applied at the time of the LVIA), specified that for residential viewpoints where 'no place of residence present' a 'very low viewpoint sensitivity' should apply (Table 5, page 25). However, as part of the RFI discussions, the DPHI directed that, for the six Rosedale lots, a viewpoint sensitivity be assumed that a dwelling was present. As a result, a 'moderate viewpoint sensitivity' was applied in the BERs as that is applicable to a private receiver with a primary view (i.e. representing a 'worst case' viewpoint sensitivity for those six lots).

2.2 Visual impact to Rosedale dwelling entitlements

Locations for possible future residences (FRs) were used to produce individual lot BERs, with those locations based on the proposed effluent management areas indicated in the 'Rosedale' lodgement plans.

The results of the BERs are as follows:

- FR3 (DE3)- low visual impact rating
- FR6 (DE4)- low visual impact rating
- FR7 (DE5)- moderate visual impact rating
- FR12 (DE6)- high visual impact rating
- FR13 (DE7)- moderate visual impact rating
- FR14 (DE8)- low visual impact rating.

Therefore, two FRs have a moderate rating and one a high rating. Of those, the dwelling entitlement analysis (refer **Table 2**) shows that:

- FR12 (DE6) (high visual impact rating)– This lot has an area of almost one hectare from where the Project would not be visible. Alternatively, if a dwelling where to be constructed at location FR12, then there are a

substantial number of trees on the lot which would likely further reduce the visual impact rating shown in the BER. As evidence, FR Rosedale B in the LVIA illustrates those trees.

- FR7 (DE 5) (moderate visual impact rating)- From almost half of this lot (13.7 hectares) there would be no views of the Project. Alternatively, if a dwelling were to be constructed at location FR7, there are a substantial number of trees on the lot and it is likely that those trees would further reduce the visual impact rating shown in the BER. As evidence, FR Rosedale B in the LVIA illustrates some of those trees.
- FR13 (DE7) (moderate visual impact writing)- There is no part of the lot from where there would be no views, however, from about two-thirds of the lot there would be no more than a quarter of the Project visible. In the north-east corner of the lot there are a substantial number of trees which could also screen views of the Project from a dwelling sited in that location. Such a position also offers the advantage of elevated views toward the south and being about 250m away from the nearest solar panels.

2.3 Visual impact to other dwelling entitlements

Table 2 provides a detailed analysis of DE1, DE2, DE9 and DE10 with the aim of minimising views of the Project, with the results summarised as:

- DE1 - A dwelling sited toward the southern corner would be the furthest from the Project (about 350m away, assuming an area for a future dwelling of up to one hectare). From that position there would be views of no more than a quarter of the Project (being the substation and a small part of the solar panel area). However, the lower part (up to about 5m) of the substation would be screened by proposed landscape planting at about five years post-planting, through screening situated along the substation fence and also the Project boundary. The upper parts of the substation would remain visible.
- DE2 - A dwelling sited toward the south-east corner would be the furthest from the Project (750m away, assuming at least a one hectare area) and would not have elevated views, thereby limiting the extent of the Project seen.
- DE9 - A dwelling sited near the centre of the lot would have no views of the Project, however, it is possible that this location could be subject to flooding.
- DE10 - A dwelling sited on the eastern half of the lot would be the furthest from the Project (about 700m away) and have limited views if sited across one of the locations from where there would be no views.

2.3 Mitigation of visual impact to dwelling entitlements

DE1 is the most visually impacted dwelling entitlement as it has close views toward the substation from all parts of the lot. Proposed landscape screening which is shown in the LVIA draft landscape plan around two sides of the substation would reduce views of the lower substation components from DE1. To further reduce visual impact to DE1 additional

landscape screening is proposed along a third side which is closest to DE1, as described in section 4.0. and shown in the revised draft landscape plan (refer Appendix C).

For all other dwelling entitlements, a location for a future dwelling has been identified that has either:

- A low visual impact rating (i.e. DE2, DE3, DE4 and DE8)
- Where there is an area of at least one hectare from where the Project would not be visible (i.e. DE5 and DE6)
- Or there is an area of at least one hectare from where there would be limited views of the Project (i.e. DE7 (which has a high number of trees and views away from the Project); DE9 (which sits low in the landscape and does not have the opportunity for elevated views, however, although flooding could be an issue); and DE10 which is also situated low in the landscape and does not have the opportunity for elevated views, with two slightly smaller areas with no views).

3. R27 dwelling visual impact level

The DPHI raised concern that in the LVIA's photomontage of R27 there is a veranda post which blocks part of the Project from view. In response, the DPHI asked for further clarification of the visual impact level should that part of the Project shielded also be included.

Discussion of the parameters of the photomontage process

The R27 photomontage location assessed in the LVIA was selected as it is a primary viewpoint in a 'worst-case' position, being in front of the main door along the closest side of the house and on an elevated veranda that allows slightly more expansive views.

The *Technical Supplement* specifies that photographs taken for the 180-degree photomontages must be from a camera mounted on a tripod, which by necessity needs to be a large tripod to support the weight of the specialised camera equipment. The use of the tripod means that the camera must be positioned back from the edge of the veranda and therefore due to the 180-degree view being photographed, it is impossible not to capture the veranda posts in that image. To clarify, a 180-degree image is equivalent to the entire extent of view if one were to hold their arms perpendicular and turn their head from looking over one arm around to the other.

It is highlighted that the 180-degree photomontages are an assessment tool and not meant to represent what one might in reality see. The main purpose of the 180-degree photomontages is to measure the 'magnitude of change' through an overlaid grid system which leads to identifying a visual impact rating for a particular viewpoint. The consequence being that 180-degree photomontages illustrate a very wide view, which is elongated and visually distorted from reality.

The revised LVIA 180-degree photomontages (**Figure E3-62**; **Appendix B**) clearly shows this distortion where the two veranda posts can be seen to each side, whereas in reality a viewer would not be able to see both posts at once and the posts are in fact much further apart then they appear (and actually almost in-line with the camera position). In comparison, the revised LVIA 'photomontages – visual impact' (**Figure E3-63**; **Appendix B**) is far more representative of a real-life view, which can be closely replicated by the extent seen if one places their hands either side of their eyes. In that example, what one sees is close to a 50mm single photograph (which is about 40 degrees) and in visual impact terms is normally referred to a 'single frame of view', being what one sees at any one time in the focussed part of our vision (without peripheral blurry side vision).

Results of the revised photomontages

A revised 180-degree photomontage set was produced to test whether removing the veranda post would alter the visual impact level, and to be conservative the cubby house in the garden was also removed from that image. The revised 180-degree photomontage set shows that, without mitigation, there would be a moderate visual impact rating for R27 (refer **Appendix B**; **Figure E3-62** (180-degree image) and **Figure E3-63** (the closer more realistic image)).

A range of landscape screening mitigation options were then tested to ascertain the most effective locations to achieve screening for this residence and reduce (or mitigate) the level of visual impact. That testing was successful in achieving a low visual impact rating for R27, as shown in the mitigation photomontages (refer **Figure E3-64** and **Figure E3-65**).

4. Revised Draft Landscape Plan

The draft landscape plan in the LVIA has been revised (refer **Figure 6-3**, **Appendix C**) to respond to the above findings, and therefore includes:

- Additional landscape screening along the western side of the Project as required to achieve a low visual impact rating for R27
- Increased landscape screening around the substation which would further reduce visual impact to DE1, which would have close views of the substation.

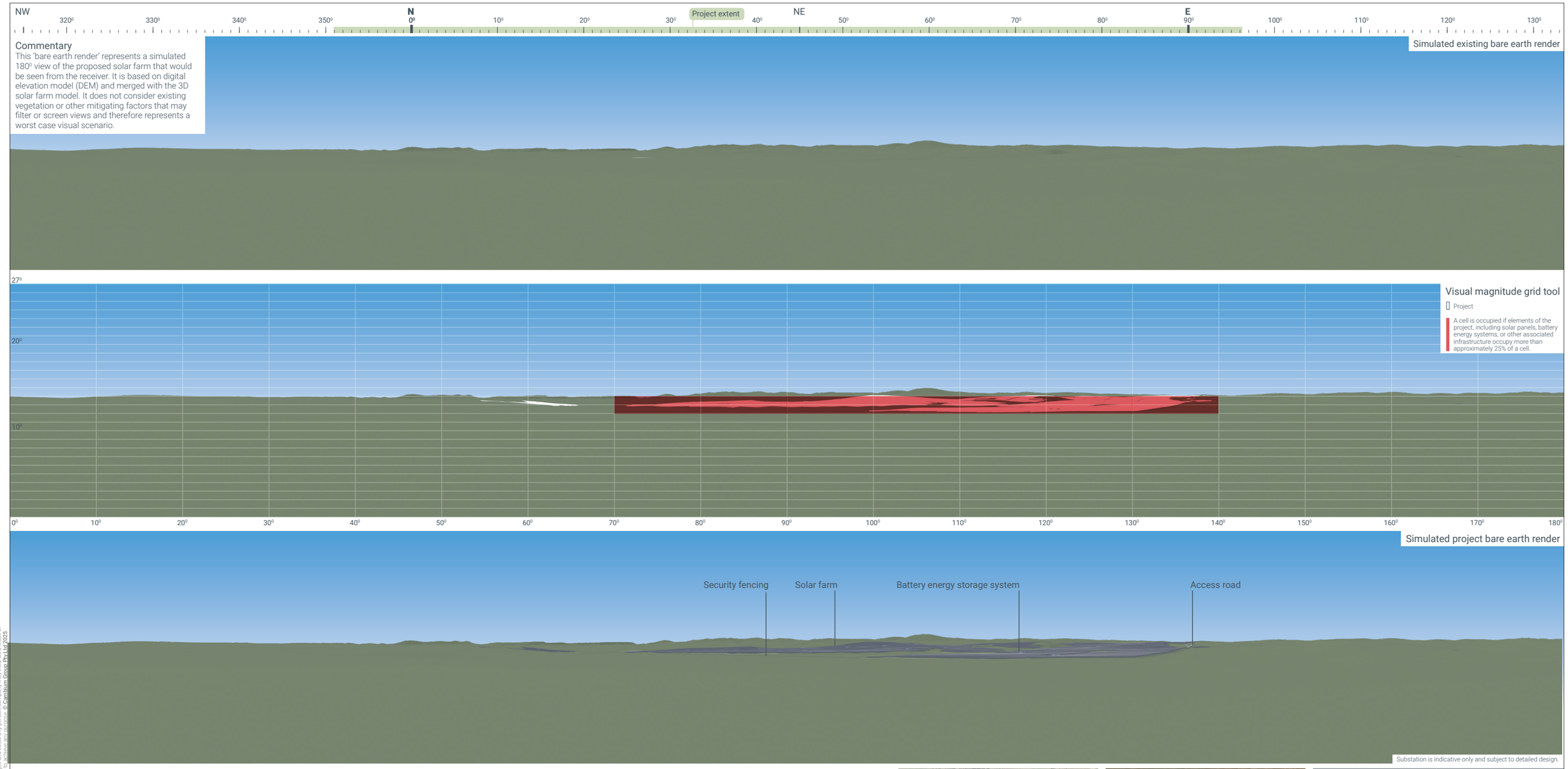
The result is substantially more landscape screening along the Project's western boundary and the substation, namely:

- Western boundary – about 6200m^2 (1240m x 50 plants per lineal metre)
- Substation – about 875m^2 (375m x 50 plants per lineal metre).

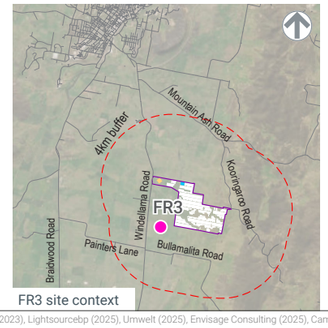
Appendix A – Bare Earth Renders (BERs) for future possible residences (FRs) for Dwelling Entitlements DE3 – DE8

Figure 1

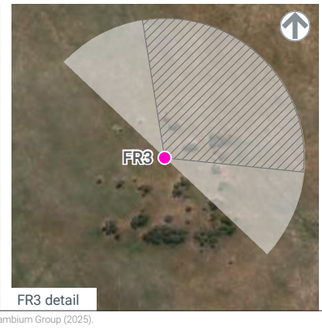
FR3 (future residential) bare earth render - Sensitivity and magnitude



Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
FR3	853 m	Residential (future)	Moderate	Moderate	Moderate	14	Low	Low



FR3 site context



FR3 detail

Date	Not applicable
Time	Not applicable
Camera level	679.3 mAHD
Camera coordinates	751573m E, 6138473m N
Camera	Virtual
Panorama type	50mm FL portrait (simulated)
Camera bearing	43°
Vertical field of view	39.6° (cropped to 27°)
Horizontal field of view	180°
Project horizontal field of view	105°
Projected coordinate system	GDA2020 MGA Zone 55
Photography	Not applicable

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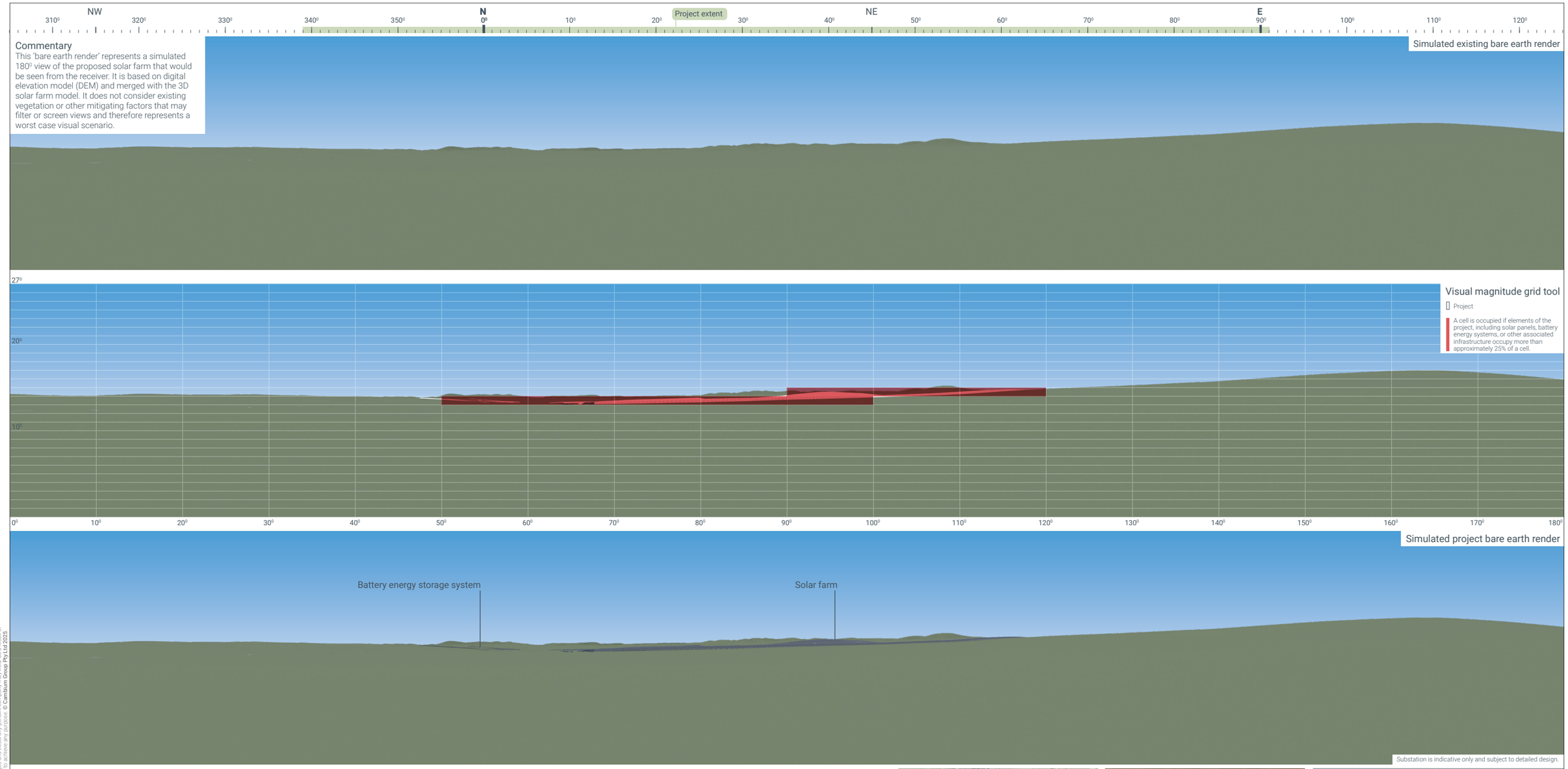
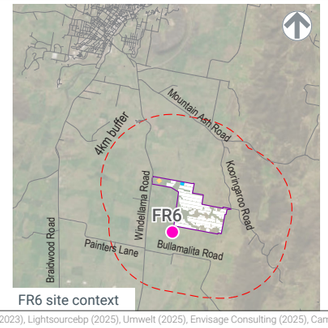
Figure 2

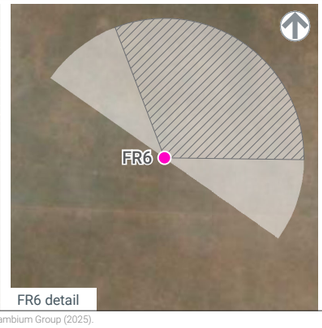
FR6 (future residential) bare earth render - Sensitivity and magnitude



Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
FR6	410 m	Residential (future)	Moderate	Moderate	Moderate	8	Low	Low



FR6 site context



FR6 detail

Date	Not applicable
Time	Not applicable
Camera level	663.1 mAHD
Camera coordinates	752310m E, 6138169m N
Camera	Virtual
Panorama type	50mm FL portrait (simulated)
Camera bearing	35°
Vertical field of view	39.6° (cropped to 27°)
Horizontal field of view	180°
Project horizontal field of view	112°
Projected coordinate system	GDA2020 MGA Zone 55
Photography	Not applicable

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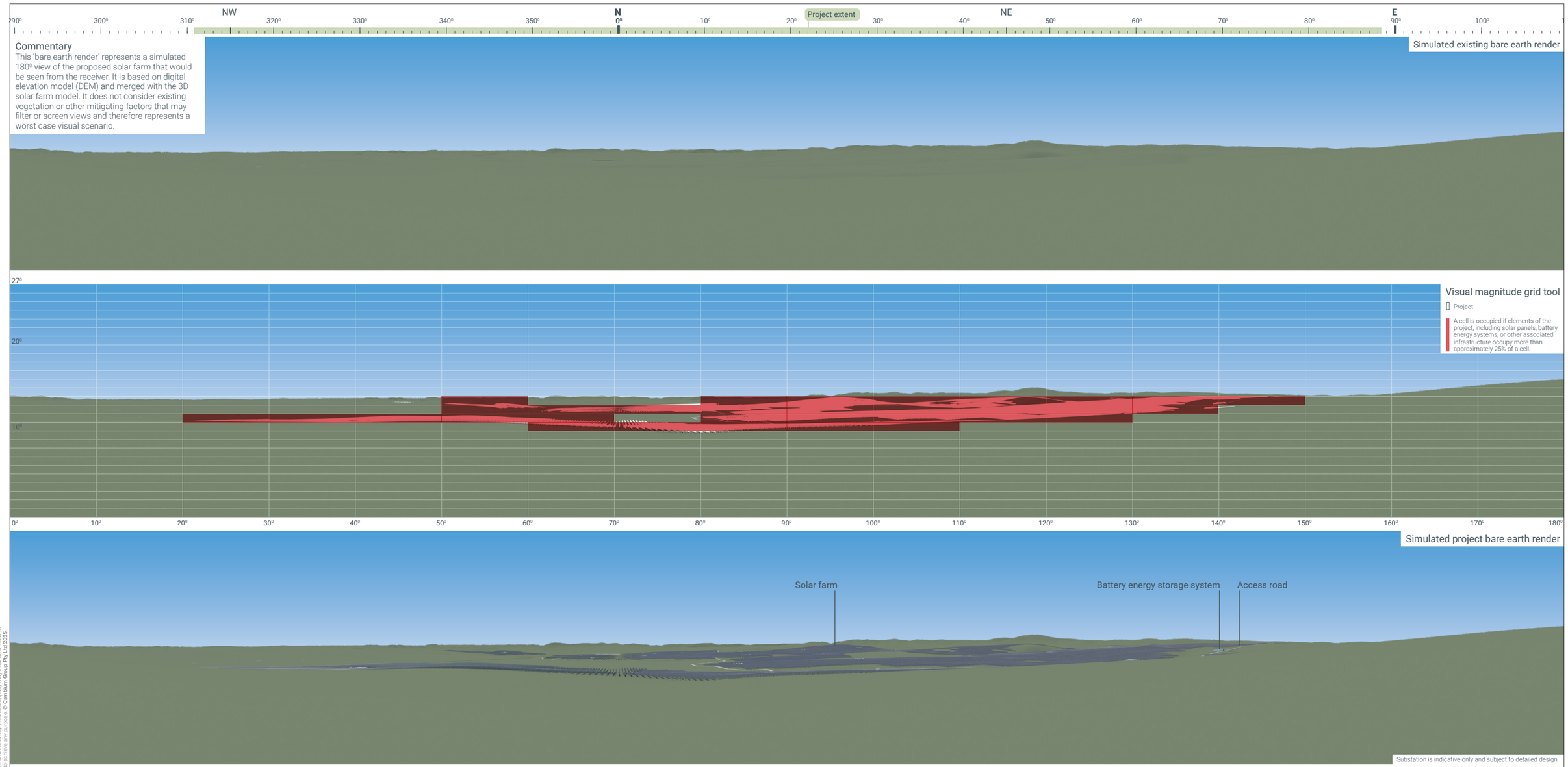
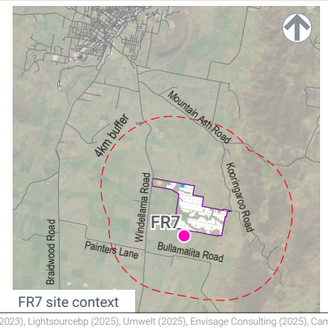
Figure 3

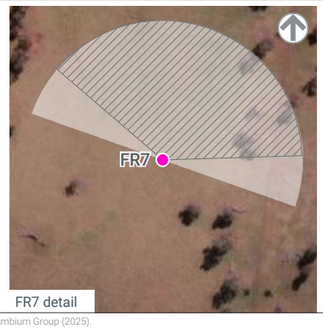
FR7 (future residential) bare earth render - Sensitivity and magnitude



Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
FR7	388 m	Residential (future)	Moderate	Moderate	Moderate	32	High	Moderate



FR7 site context



FR7 detail

Date	Not applicable
Time	Not applicable
Camera level	693.4 mAHD
Camera coordinates	753011m E, 6138058m N
Camera	Virtual
Panorama type	50mm FL portrait (simulated)
Camera bearing	19°
Vertical field of view	39.6° (cropped to 27°)
Horizontal field of view	180°
Project horizontal field of view	138°
Projected coordinate system	GDA2020 MGA Zone 55
Photography	Not applicable

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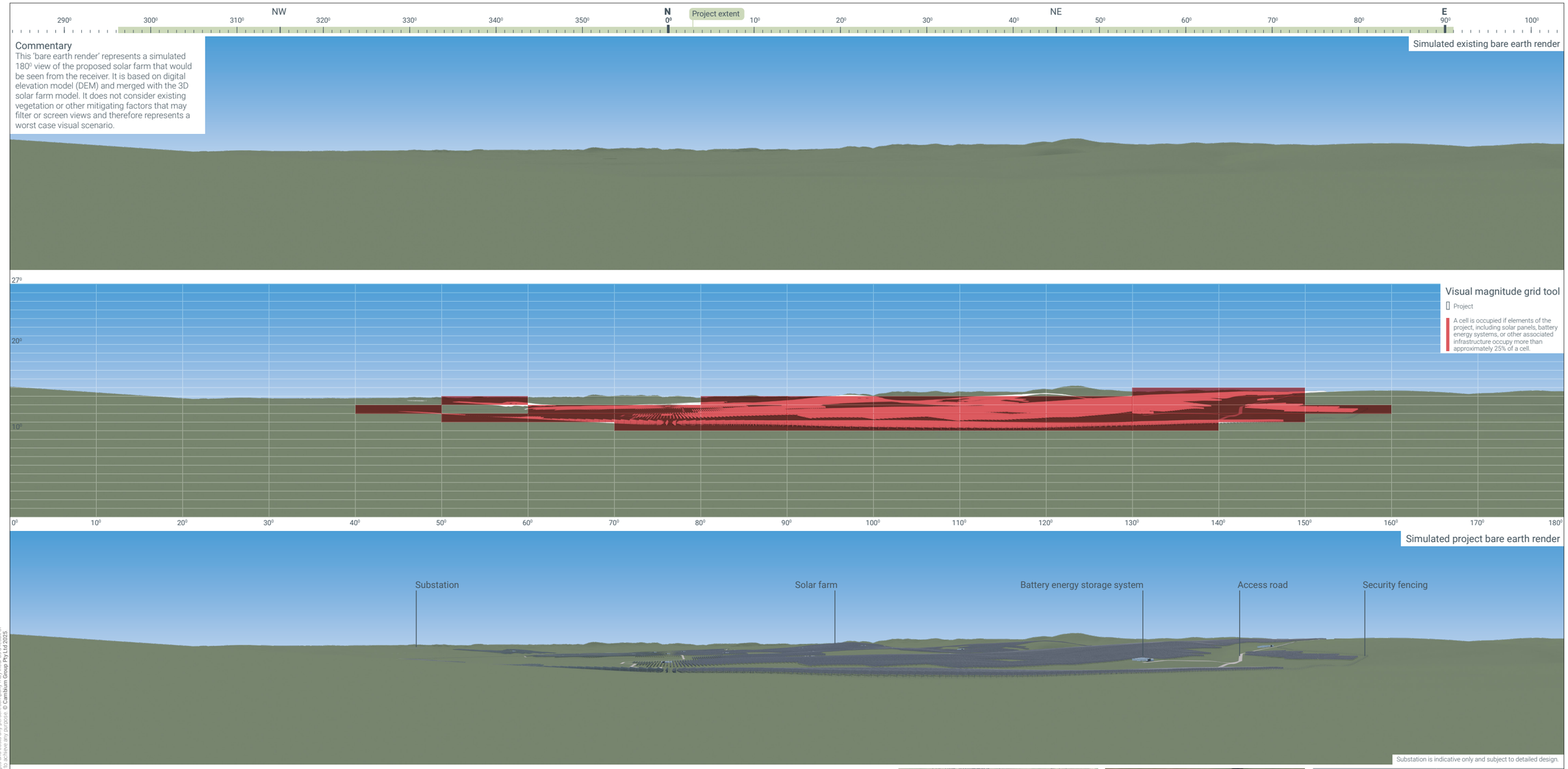
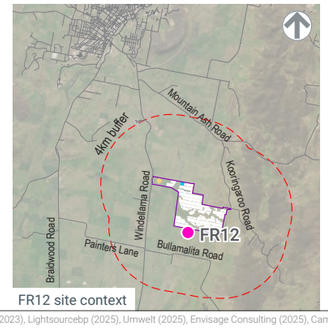
Figure 4

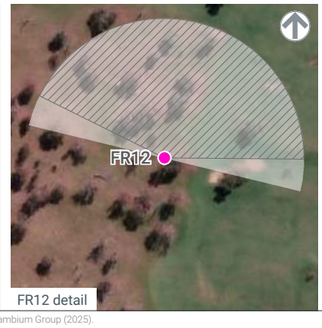
FR12 (future residential) bare earth render - Sensitivity and magnitude



Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
FR12	256 m	Residential (future)	Moderate	Moderate	Moderate	38	Very high	High



FR12 site context



FR12 detail

Date	Not applicable
Time	Not applicable
Camera level	686 mAHD
Camera coordinates	753263m E, 6138146m N
Camera	Virtual
Panorama type	50mm FL portrait (simulated)
Camera bearing	14°
Vertical field of view	39.6° (cropped to 27°)
Horizontal field of view	180°
Project horizontal field of view	154°
Projected coordinate system	GDA2020 MGA Zone 55
Photography	Not applicable

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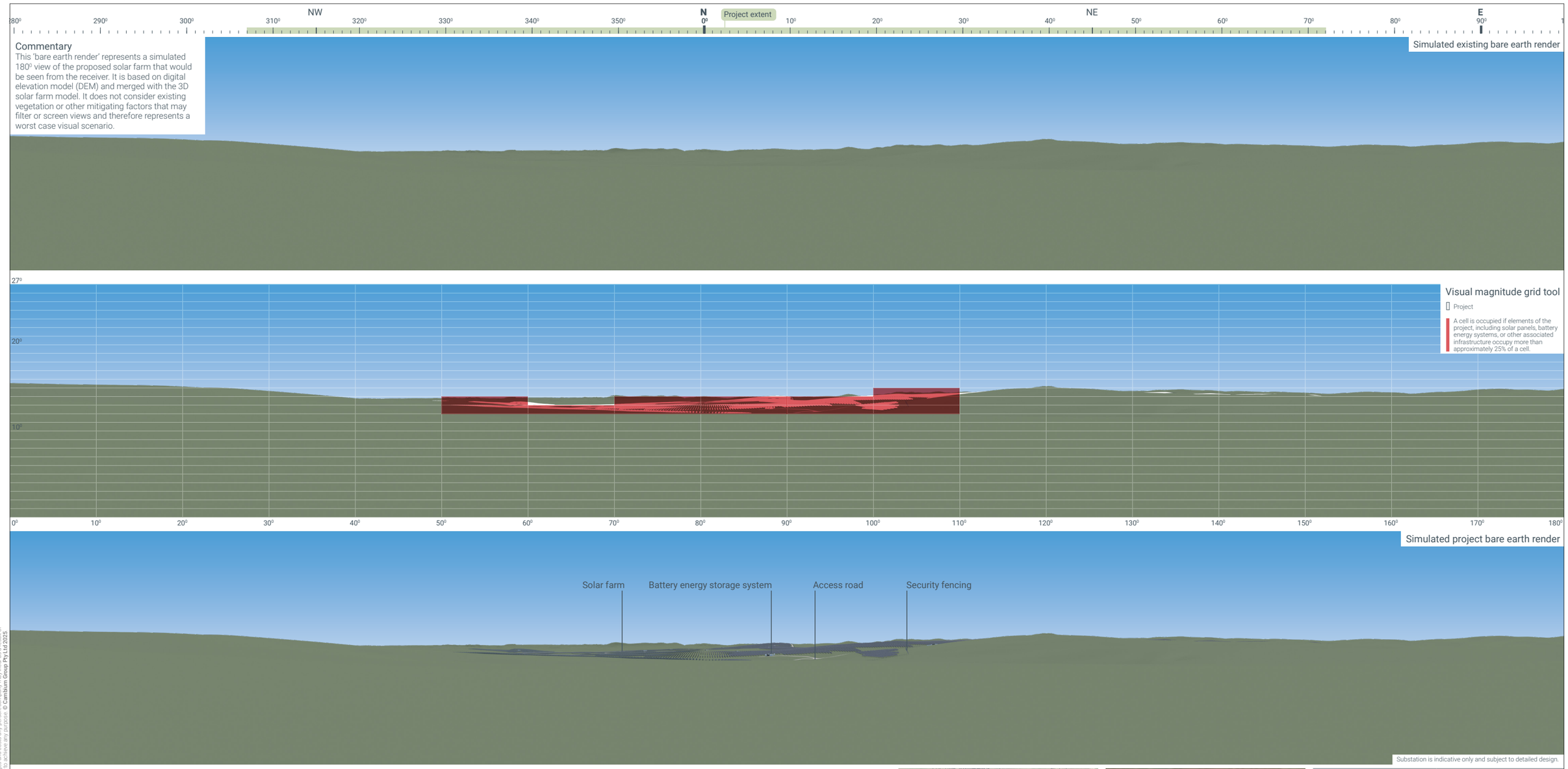
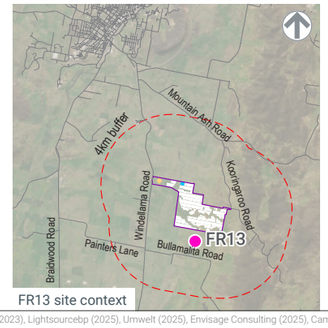
Figure 5

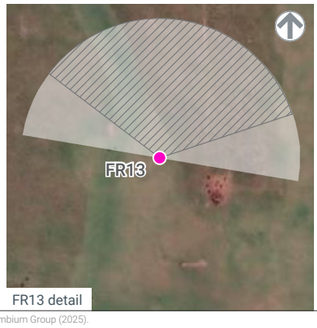
FR13 (future residential) bare earth render - Sensitivity and magnitude



Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
FR13	716 m	Residential (future)	Moderate	Moderate	Moderate	12	Low	Low



FR13 site context



FR13 detail

Date	Not applicable
Time	Not applicable
Camera level	682.9 mAHD
Camera coordinates	7513690m E, 6137601m N
Camera	Virtual
Panorama type	50mm FL portrait (simulated)
Camera bearing	9°
Vertical field of view	39.6° (cropped to 27°)
Horizontal field of view	180°
Project horizontal field of view	125°
Projected coordinate system	GDA2020 MGA Zone 55
Photography	Not applicable

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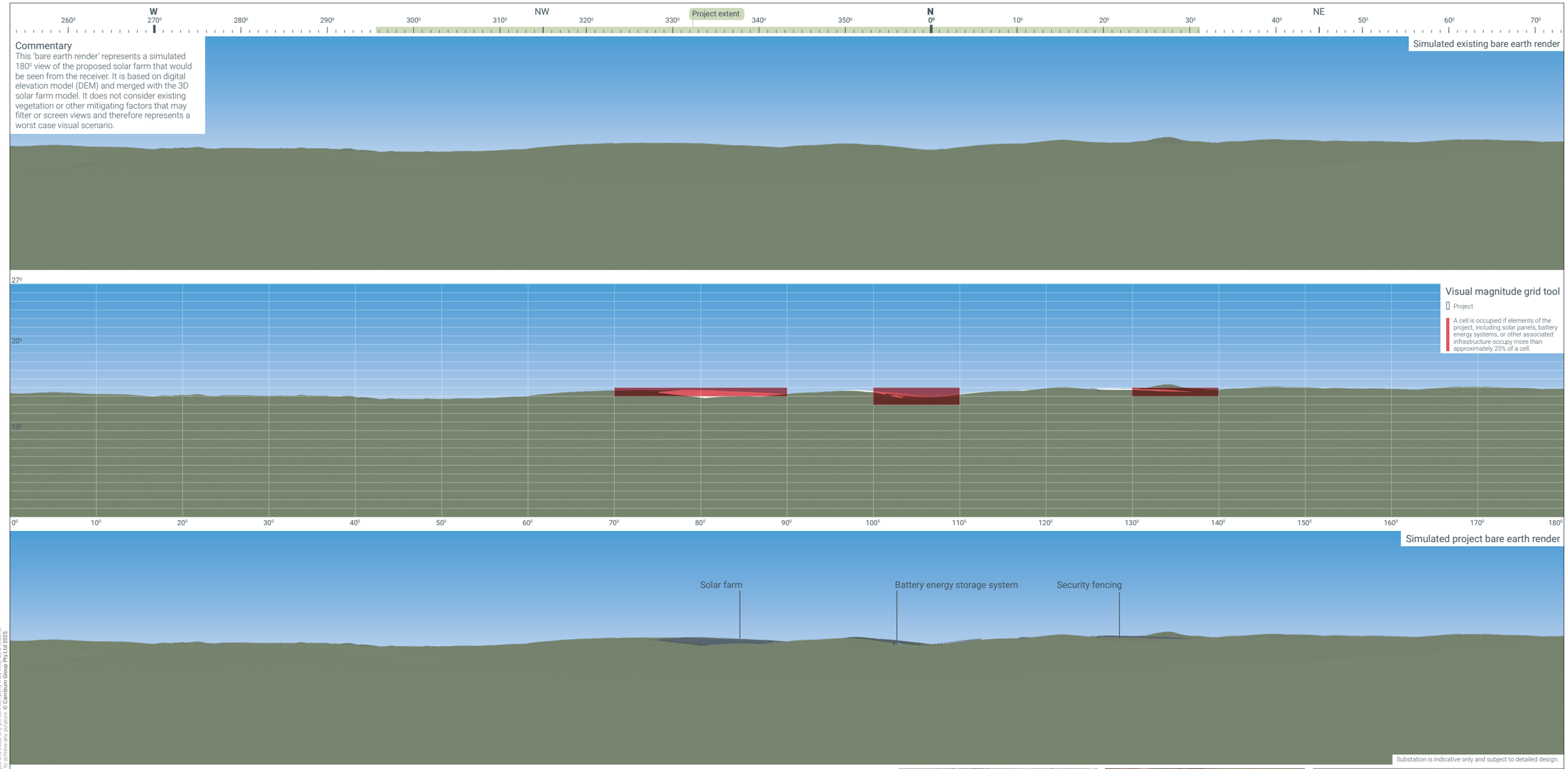
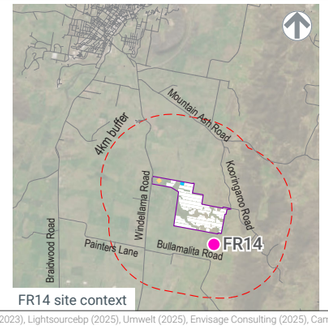
Figure 6

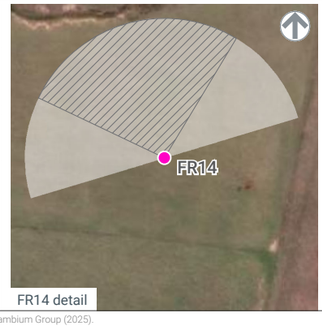
FR14 (future residential) bare earth render - Sensitivity and magnitude



Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
FR14	814 m	Residential (future)	Moderate	Moderate	Moderate	5	Very low	Low



FR14 site context



FR14 detail

Date	Not applicable
Time	Not applicable
Camera level	684.2 mAHD
Camera coordinates	754851m E, 6137407m N
Camera	Virtual
Panorama type	50mm FL portrait (simulated)
Camera bearing	343°
Vertical field of view	39.6° (cropped to 27°)
Horizontal field of view	180°
Project horizontal field of view	96°
Projected coordinate system	GDA2020 MGA Zone 55
Photography	Not applicable

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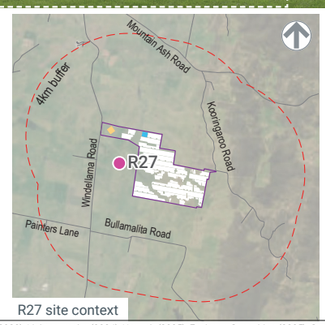
Appendix B – Revised photomontages for R27 (to replace those in LVIA)

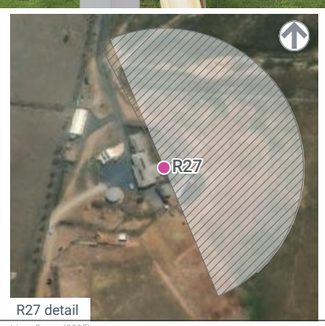
Figure E3-62

R27 (residential) photomontage - Sensitivity and magnitude

Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
R27	886 m	Residential	Moderate	Moderate	Moderate	21	Moderate	Moderate



R27 site context



R27 detail

Date	16/11/22
Time	09:35
Camera level	670.5mAHD
Camera coordinates	751849m E, 6139919m N
Camera	Canon EOS 6D Mark II (full frame DLSR)
Panorama type	50mm FL portrait
Camera bearing	75°
Vertical field of view	39.6° (cropped to 27°)
Horizontal field of view	180°
Project horizontal field of view	183°
Projected coordinate system	GDA2020 MGA Zone 55
Photography	Envisage Consulting

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Figure E3-63
R27 (residential) photomontage - Visual impact

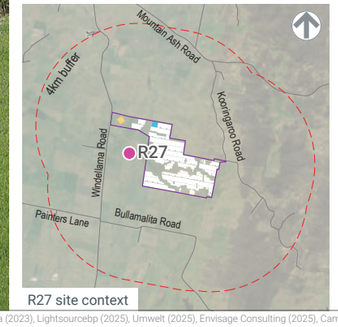
Commentary

This photograph was captured on a full frame Digital single-lens reflex (DSLR) camera using a 50mm focal length. It has been derived from stitched panoramic photography representing a 180^0 horizontal field of view (HFoV) and a 27^0 vertical field of view (VFoV) and was subsequently cropped to represent a single frame representing 39.6^0 HFoV and 27^0 VFoV.

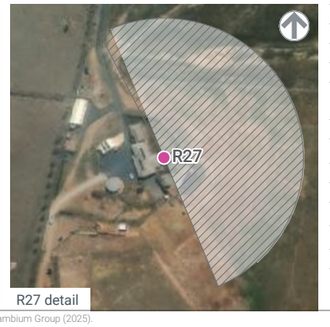
*This single frame specification provides the most accurate spatial impression as the FoV is representative to that perceived by the naked eye.

Due to page frame constraints, the top of this photograph has been cropped by 2^0 resulting in a residual 39.6^0 HFoV and a 25^0 VFoV.

*Adapted from **New South Wales Caselaw, Land and Environment Court of New South Wales.** *Stannards Marine Pty Ltd v North Sydney Council [2022] NSWLEC 99, Paragraph 268.*



R27 site context



R27 detail

Date	16/11/22
Time	09:35
Camera level	670.5mAHD
Camera coordinates	751849m E, 6139919m N
Camera	Canon EOS 6D Mark II (full frame DLSR)
Panorama type	50mm FL portrait
Camera bearing	75^0
Vertical field of view	27^0 (cropped to 25^0)
Horizontal field of view	39.6^0
Project horizontal field of view	183^0
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Photography	Envisage Consulting

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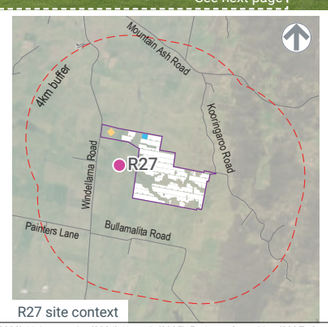
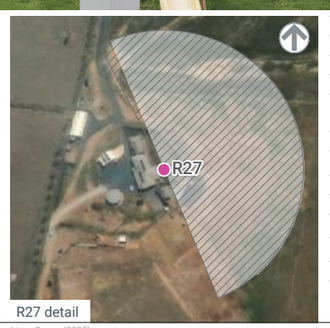
Figure E3-64

R27 (residential) mitigation photomontage - Sensitivity and magnitude

Viewpoint ID	Distance to development	Viewpoint type	Viewpoint sensitivity	Scenic quality	Visual sensitivity	Occupied cells	Magnitude rating	Visual impact rating
R27	886 m	Residential	Moderate	Moderate	Moderate	14	Low	Low



R27 site context



R27 detail

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Figure E3-65

R27 (residential) mitigation photomontage - Visual impact

Commentary

This photograph was captured on a full frame Digital single-lens reflex (DSLR) camera using a 50mm focal length. It has been derived from stitched panoramic photography representing a 180^{0} horizontal field of view (HFoV) and a 27^{0} vertical field of view (VFoV) and was subsequently cropped to represent a single frame representing 39.6^{0} HFoV and 27^{0} VFoV.

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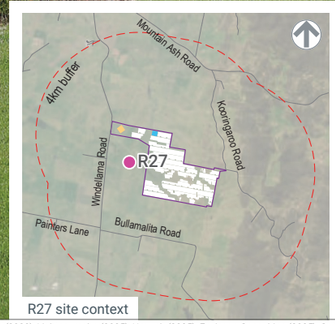

R27 site context

R27 detail

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Appendix C – Revised Draft Landscape Plan (to replace plan in LVIA)

Draft landscape plan

Gundary Solar Farm Landscape strategy

The aim of proposed landscaping is to provide a quick growing, dense screen with ecological benefits that would screen and reduce views of the solar farm infrastructure for residents and the public. Plant species have been selected that:

- are mostly locally native
- provide ecological benefit to the site (such as a food source for birds, habitat etc)
- are suitable for the site conditions (are hardy)
- can provide a quick growing screen, as well as longer-longevity species.

The draft landscape plan indicates general locations for screen planting on-site and has been prepared with preliminary input from Goulburn Mulwaree Council, and feedback from the community and surrounding land owners.

Subsequent to project approval, a detailed landscape plan would be prepared in which the planting guide may vary depending on future advice, the Project construction program and plant availability at the time.

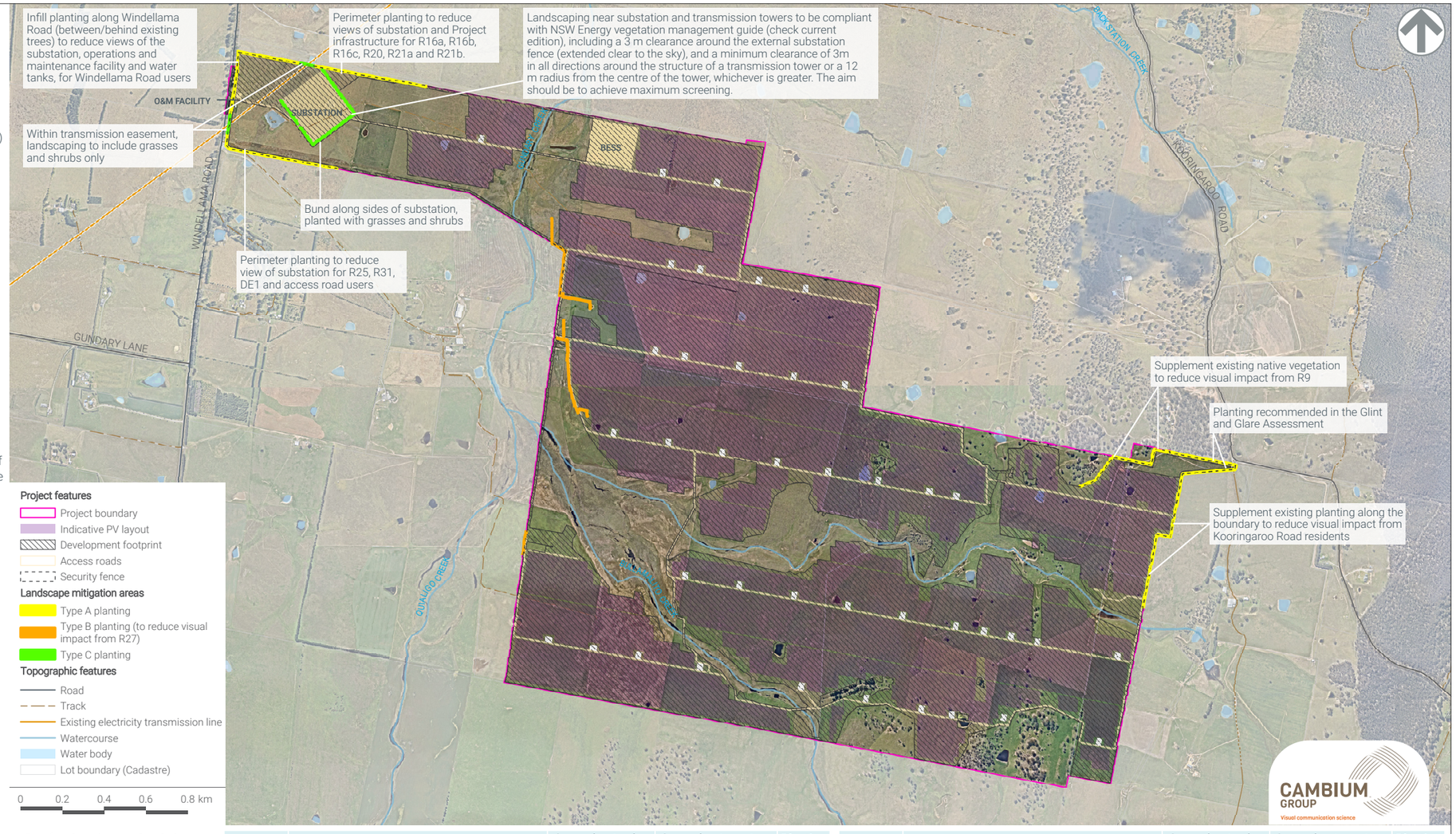
Draft planting guide

Source plants from a local native nursery using seed collected close to the Project site (if possible). Plan as early as feasible. Plant pot sizes for all plants to be 75 mm tubestock.

1. Planting areas to be 5 m wide plus a 1 m weed control buffer along each side.
2. Protect trees to be retained within or near the proposed planting areas.
3. Eradicate existing weed and pasture grass species within planting areas (at least one month before planting, with spot removal/treatment prior to planting if required). Carefully apply weed control when in the vicinity of existing trees to be retained.
4. Cultivate the full 5 m width and length of planting area to a depth of around 300 mm and incorporate soil improver and/or organic fertiliser (if appropriate) following soil testing in a number of locations to determine the appropriate soil conditioning. Do not cultivate near trees to be retained.
5. Avoid planting during harsh weather conditions (i.e. mid-summer and mid-winter).
6. Plant at densities of one plant per m^2, which equates to around 50 plants for every 10 lineal metres of planting bed.
7. Mulch (to a minimum depth of 75 mm) the full width of the planting areas.
8. Protect plants by installing and securing biodegradable plant guards around each plant (suitable to protect against rabbits if applicable) and stock fencing where necessary.

The detailed landscape plan to include a maintenance plan that continues throughout the operational period of the Project that includes:

- A defined initial establishment period of a minimum of 12 months
- Schedule for monitoring planting and watering
- Ongoing maintenance during and post establishment
- Guidance for replacement planting (for plants that fail to thrive).
- Records of maintenance practices, including listing species that have failed and any substituted plant species.



Draft planting schedule

This draft plant schedule provides an indicative range of site-appropriate species for future use in landscaping the site. The selection of species would be further refined during preparation of the detailed landscape plan.

Planting density

- Type A - 30% taller shrubs/small trees, 30% tall trees, 40% shrubs.
- Type B - 70% taller shrubs/small trees ,30% shrubs.
- Type C - 50% taller shrubs/small trees (*), 50% shrubs.

Plant type	Species[1]		Approximate size in 5 years (m)		Approximate mature size (m)		Planting type		
	Scientific name	Common Name	Height	Width	Height	Width	A	B	C
Taller trees	*Eucalyptus agglomerata*	Blue-leaved Stringybark	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus dives	Broad-leaved Peppermint	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus globoidea	White Stringybark	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus goniocalyx	Bundy	3 - 5	2 – 3	Up to 15	4 – 8	●		
	Eucalyptus macarthurii	Paddy's River Box	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus mannifera	Brittle Gum	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus rossii	Inland Scribbly Gum	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus sieberi	Silvertop Ash	3 - 5	2 – 3	Up to 20	4 – 8	●		
Taller shrubs / small trees	*Acacia decurrens*	Early Black Wattle	2 – 5	1 – 2	3 – 10	2 – 3	●	●	*
	Acacia falciformis	Broad-leaved Hickory Wattle	2 – 5	1 – 2	2 – 10	2 – 3	●	●	*
	Acacia implexa	Hickory Wattle	2 – 5	1 – 2	5 – 10	2 – 3	●	●	*
	Acacia rubida	Red-stem Wattle	2 – 5	1 – 2	2 – 10	2 – 3	●	●	*
	Allocasuarina leuhmanii	Bulloak	Up to 5	1 – 2	5 – 10	2 – 3	●	●	
	Allocasuarina littoralis	Black Sheoak	Up to 5	1 – 2	5 – 10	2 – 3	●	●	
	Allocasuarina verticillata	Drooping Sheoak	Up to 5	1 – 2	4 - 10	2 – 3	●	●	*

Plant type	Species[1]		Approximate size in 5 years (m)		Approximate mature size (m)		Planting type		
	Scientific name	Common Name	Height	Width	Height	Width	A	B	C
Shrubs	*Acacia boormanii*	Snowy River Wattle	1 - 3	1 – 2	1 – 3	1 – 2		●	●
	Acacia cultriformis	Knife-leaf Wattle	2 – 4	1 – 2	Up to 4	2 – 3		●	●
	Acacia floribunda	Gossamer Wattle	2 – 4	1 – 2	Up to 4	2 – 3		●	●
	Acacia pravissima	Wedge-leaf Wattle	2 – 4	1 – 2	Up to 4	2 – 3		●	●
	Banksia ericfolia	Heath Banksia	2 – 4	1 – 2	4	2 – 3	●	●	●
	Banksia marginata	Silver Banksia	3 – 4	1 – 2	4	2 – 3	●	●	●
	Banksia spinulosa	Hairpin Banksia	2 - 3	1 – 2	3	2 – 3	●	●	●
	Callistemon citrinus	Crimson Bottlebrush	1 - 3	1 – 1.5	1 – 3	2 – 3	●	●	●
	Daviesia mimosoides	Bacon & Eggs Pea Flower	1 - 2	0.5	1 - 2	0.5	●	●	●
	Hakea sericea	Silky Needlebush	1 - 3	1	1 – 3	1	●	●	●
	Jacksonia scoparia	Dogwood	2 – 4	1 – 2	2 - 4	1 – 2	●	●	●
	Kunzea parvifolia	Violet Kunzea	1.5	3	1.5	3	●	●	●
	Leptospermum polygalfolium	Tea Tree	2 - 3	1 – 1.5	3	1 – 2	●	●	●

* Species dependent on final substation design and safety requirements.

[1] Sourced from *Goulburn Mulwaree Development Control Plan*, Appendix B: Preferred Planting Species, and "*Goulburn Mulwaree LGA - Trees for Landcare Projects*" (unpublished list of species by local landcare groups. Estimated plant heights at 5 years are based on feedback from residents at community information session, Goulburn, 24-25 March 2024. Estimated plant widths are based on height estimates and typical growth habits. Mature plant heights and growth habits are estimated from PlantNET (Royal Botanical Gardens Sydney https://plantnet.rbgsyd.nsw.gov.au/search/simple.htm), and represent what could be reasonably expected over the longer term.

AILA®

enVisage

This draft landscape plan has been prepared by registered landscape architect (Stacey Brodbeck) RLA #719 (Australian Institute of Landscape Architects). The intent is to achieve most of the mitigation screening within 4-6 years following completion of on-site planting, assuming optimal growing conditions (e.g. free of extended drought conditions and mass pest invasion). A detailed landscape plan is required once the project is approved, to fully document and confirm planting locations and plant species.

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Appendix B

AES Addendum

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Accommodation and Employment Strategy – Addendum Report

Gundary Solar Farm

Final

February 2026

umwelt

Accommodation and Employment Strategy – Addendum Report

Gundary Solar Farm

Final

Prepared by
Umwelt (Australia) Pty Limited

On behalf of
Lightsource bp Australia

Project Director: Jane Gibbs
Project Manager: Marion O'Neil
Technical Director: Dr Sheridan Coakes
Technical Manager: Jessica Anagnastaras
Report No.: R06_30192
Date: February 2026

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

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Document Status

Rev No.	Reviewer Name	Date	Approved for Issue Name	Date
V1	Dr Sheridan Coakes	27/11/2025	Dr Sheridan Coakes	27/11/2025
V2	Jessica Anagnostaras	18/02/2026	Jessica Anagnostaras	18/02/2026

Executive Summary

This Addendum Report updates the original Accommodation and Employment Strategy (AES) (Umwelt, 2024) for the Gundary Solar Farm, responding to feedback from Goulburn Mulwaree Council following public exhibition and the Response to Submissions (RtS) phase. The report incorporates updated information about project timing, local employment targets, cumulative impacts from concurrent projects, and temporary accommodation supply.

This Addendum Report further investigates the following aspects of the AES, noting:

- Cumulative workforce timings: since the preparation of the AES multiple projects in the local area have been delayed. It is estimated that a cumulative peak construction workforce of approximately 1,250 (1,285) people may occur in Q1 2027, assuming all projects are approved. These projects would likely include the Woodlawn Energy Recovery Centre, Wattle Creek Energy Hub, Merino Solar Farm and Gundary Solar Farm.
- Local Community events: the local area hosts a range of events, including both weekly/monthly events, ad hoc events and large annual events. An indicative calendar of annual events has been developed that shows the LGA hosts a number of large annual events, primarily from October through to April, with fewer events occurring during the winter months.
- Accommodation supply: indicative supply for traditional short term accommodation and sharing economy accommodation has investigated two main scenarios, one a more collective scenario of all accommodation capacity within a 1-hour drive distance radius of the Project (Scenario 1) and consideration of the same radius, excluding accommodation options within the Goulburn Mulwaree LGA (Scenario 2). In Scenario 1 there is an estimated 2,699 rooms, while in Scenario 2 there is an estimated 2,198. Both scenarios consider relative occupancy rates across traditional short term accommodation and sharing economy accommodation.
- Revised accommodation options: as shown in the table below, the incoming workforce has been distribution across the relevant scenarios, reflecting the supply distribution of short term accommodation. This approach seeks to not overcrowd one area.

LGA	Accommodation Supply		Incoming Workforce
	Number of Rooms	% of Supply	Number of Workers
Scenario 1			
Goulburn-Mulwaree	501	18.6%	44
Upper Lachlan	165	6.1%	15
Wingecarribee	1,433	53.1%	126
Yass Valley	121	8.6%	20
Queanbeyan-Palerang	368	13.6%	32
Scenario 2			
Upper Lachlan	165	7.5%	18
Wingecarribee	1,433	65.2%	155
Yass Valley	232	10.6%	25
Queanbeyan-Palerang	368	16.7%	40

- Reducing cumulative impacts: additional considerations for managing cumulative demand for short term accommodation were outlined. This includes utilisation of Canberra if needed, consideration of key event timing, avoidance of accommodation options within the Goulburn-Mulwaree LGA, and support for a local accommodation coordinator.

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Appendix A Review of Response to Submissions and Amendment Report

1.0 Introduction

1.1 Purpose

This report provides an Addendum to the *Accommodation and Employment Strategy (AES) (Umwelt, 2024)* (this Report) prepared for the Gundary Solar Farm as part of the Environmental Impact Statement (EIS) that was exhibited in late 2024. This Report should be read in conjunction with the AES (Umwelt, 2024), however given the time lapse since the development of the original AES, data updates have been incorporated that result in some change to report outputs. **Table 1.1** outlines the main sections of the AES (Umwelt, 2024) that have been updated in the current Report.

The purpose of the Report is to respond to feedback provided by Goulburn Mulwaree Council on the 15 August 2025 post public exhibition of the Project assessment and as part of the proponent's Response to Submissions (RtS) phase.

Table 1.1 Comparison Between AES (Umwelt, 2024) and the Current Report

Relevant Sections of the AES (Umwelt, 2024)	Update Status in this Report
Introduction	Updated
Regional Profile	No update
Cumulative Considerations	Updated
Local Employment Strategy	No update
Accommodation Strategy	Update
Appendix A Stakeholder Consultation	No update
Appendix B Local Government Policy and Reports	No update
Appendix C Regional Socio-Economic Profile	No update
Appendix D Employment and Labour Force	No update
Appendix E Accommodation Housing Profile	Updated
Appendix F Accommodation Providers	No update

Source: Umwelt, 2025

1.2 Council Feedback

Feedback received from Goulburn Mulwaree Council in their review of the Response to Submissions & Amendment Report that specifically related to the Accommodation and Employment Strategy (2024) have been included in **Appendix A**. This feedback largely related to the availability of short-term accommodation within the Goulburn Mulwaree Council area, and assumptions made regarding local employment targets. A summary of the Council's feedback and where this has been addressed in this report is provided below in **Table 1.2**.

Table 1.2 Responding to Council Feedback

Outstanding Concern	Location in Report
Change in Project timing	**Section 2.0**
Reduced local employment target from 30% to 5% and flow on implications for temporary housing demand	**Section 5.0** **Section 6.0**
Delays and changes of other major projects in the local area	**Section 2.0**
Consideration of timings of locally significant events	**Section 3.0** **Section 6.0**
Risk of cumulative and concurrent SSD project workforces	**Section 3.0**
Mitigation measures	**Section 6.0**

Source: Umwelt, 2025

2.0 Cumulative Projects

2.1 Concurrent Project Construction Schedules

The listing of cumulative project construction development, relevant to the Gundary solar farm project, has been updated based on feedback provided by Goulburn Mulwaree Council and a review of the most recent publicly available information on project construction timing and progression.

As **Table 2.1**, **Figure 2.1** and **Figure 2.2** outlines, a number of the projects that were anticipated to have commenced construction by the end of 2025, at the time of preparing the initial Accommodation and Employment Strategy (Umwelt, 2024) have not commenced works. For many of these projects, it is assumed that construction will begin in Q4 2026, given that since original reporting, no additional projects have subsequently been approved by DPHI.

Table 2.1 Expected Cumulative Projects

Project	Status	Data Source / Assumption
Marulan Solar Farm	Approved	Construction commencement date provided by Goulburn Mulwaree Council
Blind Creek Solar Farm	Approved	No public information on construction commencement. Assumes Q2 2026 construction commencement.
Hume Link	Approved	Construction commencement date provided by Goulburn Mulwaree Council
Gundary Solar Farm	Assessment	Assumes Q2 2027 construction commencement
Wattle Creek Energy Hub	Response to submissions	Assumes Q4 2026 construction commencement due to lack of public information
Marulan Quarry	Assessment	Assumes Q4 2026 construction commencement due to lack of public information
Merino Solar Farm	Prepare EIS	Assumes Q1 2027 construction commencement due to lack of public information
Woodlawn Advanced Energy Recovery Centre	Response to submissions	Assumes Q4 2026 construction commencement due to lack of public information

Figure 2.1 identifies a flurry of commencing construction activities in Q4 2026 through to Q2 2027, including the proposed Gundary Solar Farm.

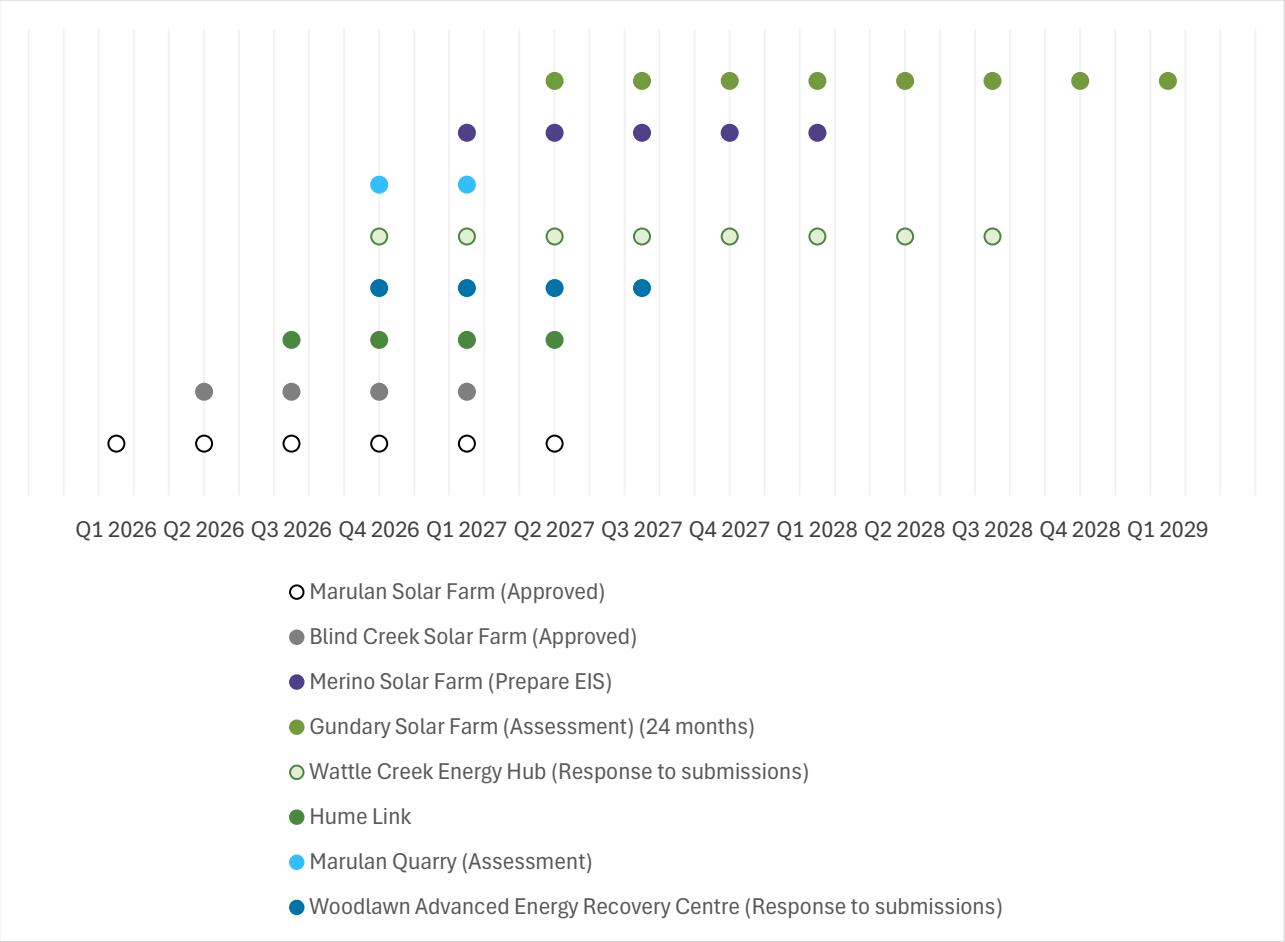

Figure 2.1 Cumulative Projects Indicative Construction Timeframes

Source: Umwelt, 2025

2.2 Estimated Construction Workforce Size

Peak construction workforce numbers and projected construction periods and start dates were used to estimate the cumulative construction workforce size from 2026 to 2029. Ramp-up and wind-down modelling was included, given further information regarding construction workforce numbers.

Based on available information, and additional data provided by Goulburn Mulwaree Council, the peak estimated cumulative construction workforce is approximately 1,250 (1,285) and is anticipated to occur around Q1 2027, as shown in **Figure 2.2**.

The Gundary Solar Farm is expected to start construction just after the peak cumulative construction workforces. Importantly, much of the construction workforce demand generated by the Gundary Solar Farm will be occurring in a declining cumulative workforce context.

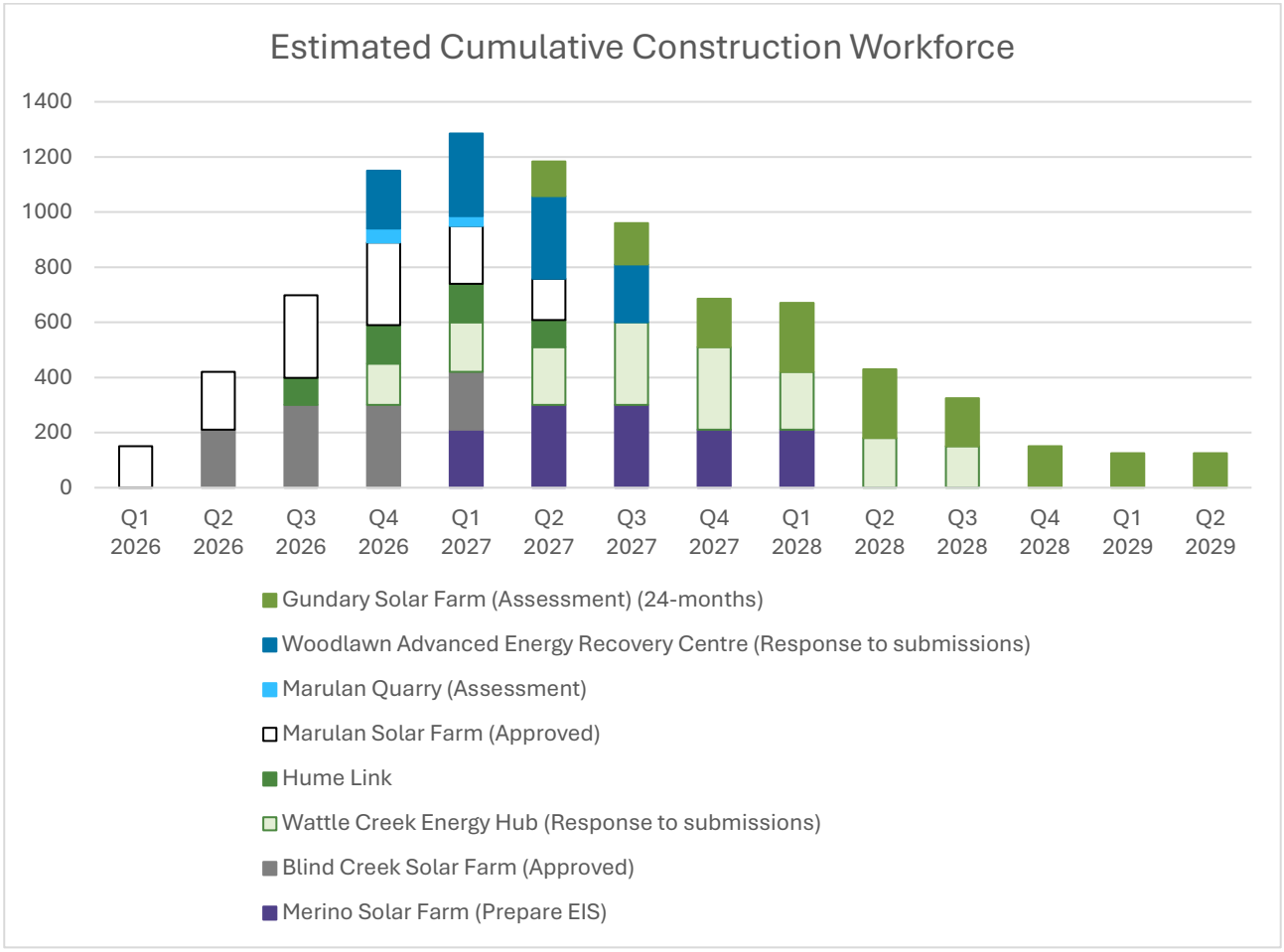

Figure 2.2 Estimated Cumulative Construction Workforce Size

Source: Umwelt, 2025

3.0 Local Community Events

In their feedback on the AES (Umwelt, 2024), Council also requested further consideration of local events occurring within the LGA, particularly those likely to generate additional demand for temporary accommodation.

Umwelt has collated supplementary publicly available information relating to the nature and frequency of events, that also includes multi-week events/programs, smaller one-off events and annual and larger events that occur in Goulburn and the local area. Where possible, previous and future event calendar information has been used to develop a more complete understanding of events occurring over a 12-month calendar period.

3.1 Event Frequency

Table 3.1 provides an overview of the frequency of events that occur in the LGA. The table outlines the event name, type of event, frequency and whether the event is likely to increase demand for short-term accommodation.

It is important to note that community events play an important role in regional tourism, and while events such as local music events (such as the Goulburn Regional Ukulele Band Sessions), sporting events (such as Parkrun) and markets primarily address local residents needs and may not be the primary driver of overnight tourism, they contribute to overall visitor experience.

Importantly, there are a number of events in the LGA that may generate demand for short-term accommodation, which centre around Car Racing and Animal Racing.

Table 3.1 Frequent Events

Event Description	Type of Event	Frequency
Sunday Sessions	Music	Weekly
Goulburn Regional Ukulele Band Sessions	Music	Weekly
Goulburn Open Mic Night	Music	Twice a month
Traditional Irish Music Sessions	Music	Monthly
Goulburn Local Live Music Showcase	Music	Twice a month
Creative Kids – High School	Art and Creative	Weekly
Art Teenies	Art and Creative	Weekly (September-November)
ScrapKat's Craft Group	Art and Creative	Monthly
A Taste of Art at the Bungonia Community Hall	Art and Creative	Monthly
Pheasant Wood Open Track Days	Car Racing	Multiple per month and varied dates
Marulan & District (MaD) Cars and Coffee	Car Racing	Monthly
One Raceway Track Day	Car Racing	Subject to One Raceway calendar
Goulburn Speedway	Car Racing	One-two per month
Cars are the Courthouse	Car Racing	Monthly

Event Description	Type of Event	Frequency
Goulburn Wheelbears Wheelchair Basketball	Sport	Weekly (February-December)
Goulburn Parkrun	Sport	Weekly
Goulburn Greyhound Racing	Racing	Weekly
Goulburn Harness Racing	Racing	Once a month during racing season (September-April)
Goulburn Uniting Church Op-Shop and Café	Market	Weekly
Marulan Book Exchange	Market	Twice a month
Windellama Country Markets	Market	Monthly
Goulburn Rotary Parkside Markets	Market	Monthly
Goulbourn Farmers Markets	Market	Monthly
Goulburn Makers Market	Market	Monthly
Markets on Bourke	Market	Monthly
Bungonia Sunday Breakfast	-	Weekly

Source: Goulburn Australia, View All Events, https://www.goulburnaustralia.com.au/events/view-all-events/, November 2025

3.2 Multi-week Programs and Small Events

It is understood that the LGA also hosts numerous multi-week programs that focus on the arts, creative and sustainability sectors. As of November 2025, examples of current multi-week programs include:

- Creative Kids – Primary Schools Kids K-6
- Night School Series Exploring Drawing Media
- Saturday Mosaics
- Printmaking with Water Colour
- The Painted Object
- Introduction to Permaculture Design course.

As these are multi-week programs which run for one or two days per week, it is expected that attendees are likely to be local residents.

It is understood that the LGA also hosts numerous smaller one-off events across a range of sectors, with a specific focus on the arts and creative sector, including art exhibitions and theatre events, as well as music concerts, cellar door wine tastings, charity events and dinner galas. It is expected that these events may generate limited demand for short-term accommodation.

3.3 Annual and Larger Events

The LGA hosts a number of large annual events, primarily from October through to April, with fewer events occurring during the winter months. These include car racing, horse racing and sporting events. Further to this, the LGA hosts a range of agricultural shows, reflecting Goulburn's role as a service centre for surrounding LGAs and industries.

It is expected that the events listed in **Table 3.2** would likely generate demand for short-term accommodation from regional, intra-state and inter-state visitors.

Table 3.2 Annual and Larger Events

Jan	Feb	March	April	May	June	July	August	September	October	November	December
Swimming NSW Country Regionals – Goulburn	Hewitt Memorial Race	Goulburn Show	Carnival of Cups	NSW Police – Attestation Parade	-	-	NSW Police – Attestation Parade	SpeedFest	Goulburn Lilac City Festival	Goulburn Dressage Competition	Hockey Australia Masters Indoor Invitational
Goulburn Australia Day Celebrations	Hockey NSW Indoor State Championship – Masters Women	Tarago Show	Football NSW Southern Region Championships						Hockey NSW Indoor State Championship – Open Men	Cricket NSW Southern District Plan B Open Women's Competition	Goulburn Thoroughbred Racing – Christmas Cup
	Goulburn TrackPower Carnival		Brigadoon Highland Gathering (Bundanoon)						Hockey NSW Indoor State Championship – Open Women	Motor Racing Australia Regular Season Round	NSW Police – Attestation Parade
	Canberra Judo Internal Open – Goulburn								Steampunk Victoriana Fair	Goulburn Car and Motorcycle Show	
	Goulburn Multiculture Festival								Tastes of the Goulburn	Goulburn Thoroughbred Racing	
	Goulburn Railway Bowling Club's Annual Rose Tournament									Hockey NSW Indoor State Championship – under 18 Girls	
	Australian Blues Music Festival (Goulburn)									Hockey NSW Indoor State Championship – under 18 Boys	
										Goulburn Poultry Fanciers' Society Auction	
										Goulburn Xmas NightMarkets	
										1R Ride Day	
										IOGKF Gasshuku	
										Street Feast	

Source: Goulburn Australia, View All Events, https://www.goulburnaustralia.com.au/events/view-all-events/, November 2025

4.0 Accommodation Supply

The accommodation supply analysis has primarily focused on short-term accommodation, specifically traditional short-term and sharing economy accommodation.

Traditional short-term accommodation refers to hotels, motels and caravan parks that are owned and operated by an accommodation provider. Data relating to the supply of traditional short-term accommodation has been sourced from the Australian Tourism Data Warehouse (ADTW) Quarter 4 2025 Report. The ADTW data is a purchased data set with an annual subscription.

To understand the supply of sharing economy accommodation, AirDNA was used to identify Airbnb listings. AirDNA is also a subscription-based service that provides a live dashboard of share economy listing that is updated monthly. Specifically, in the current analysis, AirDNA data was used to understand the following by LGA:

- Number of listings
- Bedroom diversity
- 12-month occupancy rates.

This selection of AirDNA data was restricted to only include 'entire place', given that it is assumed that the workforce will not share a dwelling with a host (e.g. rent a private room). It is also assumed that workers may share a house, however, will not be sharing a bedroom.

While the initial Accommodation and Employment Strategy (Umwelt, 2024) did consider private rental accommodation as a potential accommodation option for the incoming construction workforce, extended low rental vacancy rates across regional NSW indicate a highly strained rental market. As a result, the updated analysis does not include private rentals as an option for construction workforce accommodation.

4.1 Defining the Study Area – Drive-time Analysis

A drive-time analysis was conducted to understand the distribution of short-term accommodation providers within a 1-hour drive time from the Project. A summary of this analysis is presented in **Figure** 4.1.

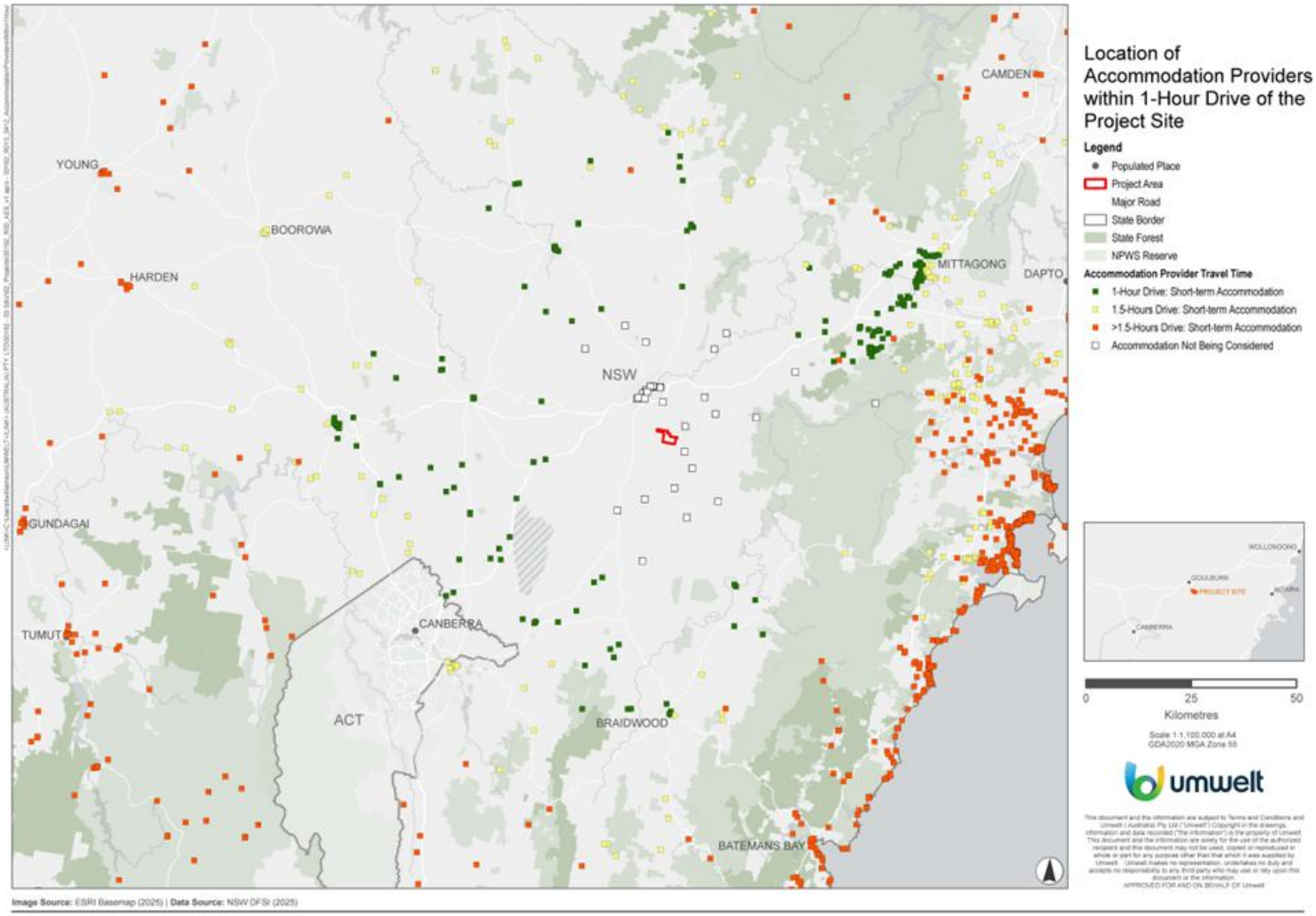

Figure 4.1 Location of Traditional Short-Term Accommodation Providers within a 1-hour Drive Time

Source: ATDW, 2025; Umwelt, 2025

Utilising the 1 hour drive-time radius, **Table 4.1** provides a summary breakdown of rooms and sleeping capacity for **traditional short-term accommodation**. Additional capacity between 1 and 1.5 hours is also provided to illustrate the additional capacity within a wider drive-time radius.

Table 4.1 Traditional Short-Term Accommodation Supply

Drive Time	Total Number of Rooms	Accommodation/Sleeping Capacity
Up to 1 hour	3,837	21,216
Between 1 and 1.5 hours	1,790	6,017

Source: ATDW, 2025

Figure 4.2 outlines the distribution of traditional short-term accommodation supply within a 1-hour drive from the Project site by LGA. As evidenced below, Goulburn Mulwaree LGA has the greatest supply of rooms and accommodation/sleeping capacity, representing around 35.5% of traditional short-term accommodation rooms within the 1-hour drive time radius.

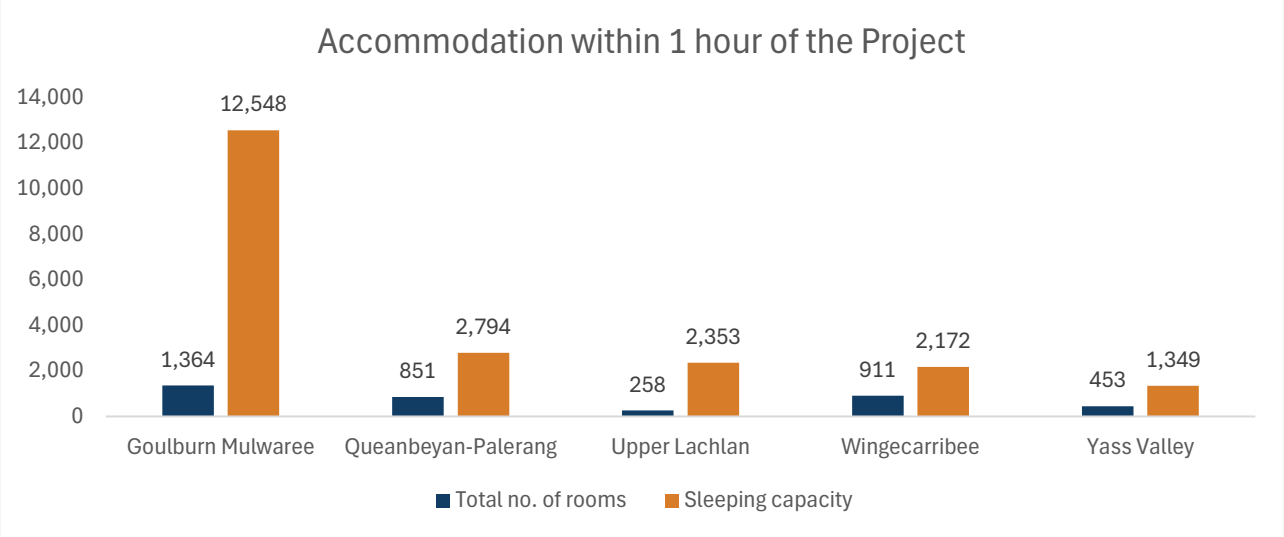

Figure 4.2 Traditional Short-Term Accommodation Supply with 1-hour Drive Time of the Project

Source: ADTW, 2025

In relation to the assessment of sharing economy accommodation, given the AirDNA unit of data collection (being LGA level), the study area was determined as the five LGAs that intersect the 1-hour drive time analysis and thus included the LGAs of Goulburn Mulwaree, Queanbeyan-Palerang, Upper Lachlan, Wingecarribee and Yass Valley[1].

Given the above, **Table 4.2** provides a breakdown of total number of listing and total number of rooms by the specified LGAs for **sharing economy accommodation supply**.

[1] Unlike ATDW, AirDNA does not provide itemised geolocated lists of providers.

Table 4.2 Sharing Economny Accommodation Supply

Drive Time	Total Number of Listings	Total Number of Rooms
Goulburn Mulwaree	126	273
Queanbeyan-Palerang	128	280
Upper Lachlan	70	159
Wingecarribee	812	2,111
Yass Valley	83	188
Total	**1,219**	**3,011**

Source: AirDNA

4.2 Accommodation Capacity – Scenario Analysis

It is understood that Goulburn Mulwaree Council has raised some concerns regarding the use of short-term accommodation, and the potential negative impacts that may be experienced on local tourism due to overcrowding of the visitor accommodation market.

In recognition of Council's issues, the updated accommodation strategy considers two main scenarios, one a more collective scenario of all accommodation capacity within a 1-hour drive distance radius of the Project (Scenario 1) and consideration of the same radius, excluding accommodation options within the Goulburn Mulwaree LGA (Scenario 2).

Both scenarios utilise assumptions from the initial Accommodation and Employment Strategy (Umwelt, 2024), and use an estimated occupancy rate of 73% across all traditional short-term accommodation providers. This was informed by engagement outcomes with accommodation providers. Average LGA vacancies rates from AirDNA were used to estimate availability of sharing economy accommodation.

4.2.1 Traditional Short-Term Accommodation

When taking into consideration the above assumptions, estimated available traditional short-term accommodation rooms for hosting the Project workforce has been calculated using the following formula:

(Supply x vacancy rate %)

In applying this formula, Scenario 1 estimates there would be approximately 1,036 rooms available to host the Project workforce. While in Scenario 2, excluding accommodation options in the Goulburn Mulwaree LGA, it is estimated that there would be approximately 668 available rooms to host the Project workforce (refer to **Table 4.3**).

Table 4.3 Scenario Testing for Traditional Short-Term Accommodation

Factors	Scenario 1	Scenario 2
Total number of rooms	3,837	2,473
Estimated occupancy rate	73%	73%
Estimated number of available rooms	**1,036**	**668**

Source: Umwelt, 2025

4.2.2 Sharing Economy Accommodation

In relation to sharing economy accommodation, across the drive time radius area (as defined), there was a total of 1,219 listings, and 3,012 rooms (refer to **Figure 4.3**), with Wingecarribee LGA demonstrating the largest number of both accommodation listings and rooms.

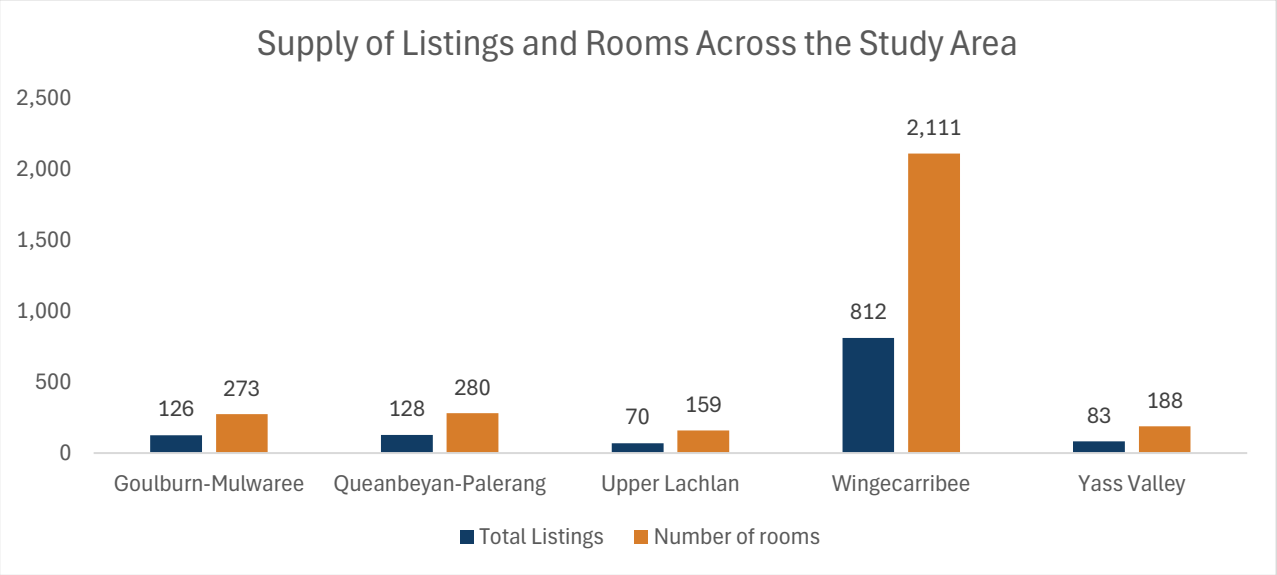

Figure 4.3 Sharing Economy Accommodation within the Study Area

Source: AirDNA, 2025

Note: The number of listings refers to only 'entire place'.

The 12-month average vacancies for the defined area/LGAs is presented in **Figure 4.4**. The average sharing economy accommodation vacancy rate was 54.4% between November 2024 and October 2025. Golburn-Mulwaree and Queanbeyan-Palerang LGAs demonstrated the lowest average vacancy rates of 48.7% and 49.1% respectively. Upper Lachlan LGA had the highest vacancy rate of 59.5%.

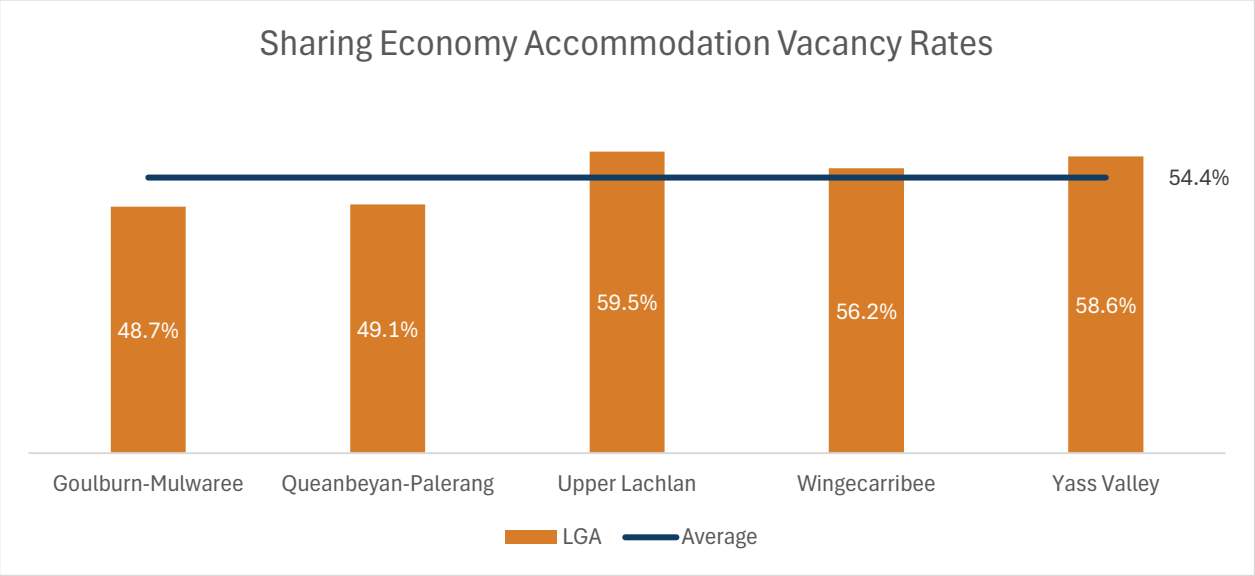

Figure 4.4 Sharing Economy Accommodation Vacancy Rates by LGA

Source: AirDNA, 2025

To understand the potential number of available sharing economy accommodation rooms to support the incoming Project construction workforce, LGA specific vacancy rates have been applied to supply in the relevant LGA, again utilising the supply x vacancy rate formula applied to both scenarios.

Consequently, Scenario 1 estimates that there would be approximately 1,663 available rooms to host the Project workforce. While in Scenario 2 it is estimated that there would be approximately 1,530 available rooms, as presented in **Table 4.4**.

Table 4.4 Scenario Testing for Sharing Economy Accommodation

Factors	Scenario 1	Scenario 2
Total number of rooms	3,012	2,739
Estimated occupancy rate	40.6%-51.3%	40.6%-50.9%
Estimated number of available rooms	**1,663**	**1,530**

Source: Umwelt, 2025

Table 4.5 further outlines the breakdown of available supply by LGA.

Table 4.5 Distribution of Sharing Economy Accommodation Supply

LGA	Number of Listings	Number of Rooms	Average Vacancy Rate	Available Room Supply
Goulburn Mulwaree	126	273	48.7%	133
Queanbeyan-Palerang	128	280	49.1%	138
Upper Lachlan	70	159	59.5%	95
Wingecarribee	812	2,111	56.2%	1,187
Yass Valley	83	188	58.6%	110

Source: Umwelt, 2025

4.3 Total Supply

Based on the analysis, the total number of available rooms that could potentially be accessed to house the incoming Project construction workforce is presented in **Table 4.6**. As detailed, the majority of potential supply in the traditional short term accommodation market is likely to be in Goulburn Mulwaree, Wingecarribee and Queanbeyan-Palerang LGAs, while in relation to sharing economy accommodation, Wingecarribee, Queanbeyan-Palerang and Goulburn Mulwaree LAGs are likely to have the greatest potential supply.

Table 4.6 Total Supply

Factors	Scenario 1	Scenario 2
Estimated available rooms to host Project workforce – traditional short-term accommodation	1,036	668
Estimated available rooms to host Project workforce – sharing economy accommodation	1,663	1,530
Estimated available rooms to host Project workforce – Total	**2,699**	**2,198**

Source: Umwelt, 2025

5.0 Local Employment

As outlined in the Accommodation and Employment Strategy (Umwelt, 2024), the Project is using a local employment target of approximately 5% as the base/worst case scenario. The challenges for local employment that were outlined in the Accommodation and Employment Strategy (Umwelt, 2024) remain unchanged and are still considered relevant.

It is expected that the Project will generate approximately 400 Full Time Equivalent (FTEs) roles over the construction period, with an anticipated peak construction workforce of 250 personnel. Based on this assumption, the local employment base/worst case would seek employment of 12-13 workers currently resident in the locality. It is expected that an additional 237-238 workers would therefore be required to travel into the region (incoming workforce) during the peak construction period, equating to around 95% of the peak construction workforce (as summarised in **Table 5.1**).

Table 5.1 Base Case Local Employment

Peak Construction Workforce	Base Case Target	Base Case Number
Local employment	5%	12-13 FTEs
Incoming workforce	95%	237-238 FTEs
Total	**100%**	**250 FTEs**

Source: Umwelt, 2025

Renewable energy projects can generate benefits to the local economy during construction periods, and consequently local employment should be enhanced where possible.

6.0 Revised Accommodation Options Analysis

The updated/revised Accommodation analysis is based on the assumptions outlined in the initial Accommodation and Employment Strategy (Umwelt, 2024), unless stated otherwise. As has been previously noted, due to low rental vacancy rates across regional NSW, and an evident increase in the supply of sharing economy accommodation over the past 12-months; the use of private rentals to house the incoming construction workforce has not been considered in this analysis.

6.1 Accommodation Options

Based on a local employment target of around 5% and information presented in **Section 4.0**, this analysis outlines an approach to appropriately house approximately 238 temporary incoming construction workers within a 1-hour drive distance radius of the Project site[2].

Section 6.1.3 outlines an estimated proportion of the workforce to be housed in each LGA by accommodation type according to the total number of rooms available, with consideration of existing use of accommodation by other industries e.g. tourism, health, as well as cumulative project development.

The distribution of traditional short-term and sharing economy accommodation is presented across the two scenarios assessed. It is important to note that the number of bedrooms presented as 'available accommodation' takes account of:

- Traditional short-term accommodation
- Sharing economy accommodation
- Relevant occupancy rates.

6.1.1 Scenario 1

As outlined in **Table 6.1**, Golburn-Mulwaree LGA demonstrates the largest number of available rooms in relation to traditional short-term accommodation, while Wingecarribee LGA has the largest representation of available rooms in relation to sharing economy accommodation.

Collectively across traditional short-term and sharing economy accommodation types, there is approximately 2,699 available rooms in Scenario 1, suggesting sufficient availability to house the incoming construction workforce demand at peak.

[2] Noting that some sharing accommodation listings will be outside the 1-hour drive time analysis but within adjacent LGAs.

Table 6.1 Supply by Location for Sceanrio 1

Locality (LGA)	Traditional Short-Term Accommodation Rooms		Sharing Economy Accommodation Rooms		Total	
	Number	%	Number	%	Number	%
Golburn-Mulwaree	368	35.5%	133	8.0%	501	18.6%
Upper Lachlan	70	6.7%	95	5.7%	165	6.1%
Wingecarribee	246	23.7%	1,187	71.4%	1,433	53.1%
Yass Valley	122	11.8%	110	6.6%	232	8.6%
Queanbeyan-Palerang	230	22.2%	138	8.3%	368	13.6%
Total	**1,036**	**99.9%**	**1,663**	**100.0%**	**2,699**	**100.0%**

Source: Umwelt, 2025

6.1.2 Scenario 2

As outlined in **Table 6.2**, Wingecarribee and Queanbeyan-Palerang LGAs have the largest representation of available rooms in relation to traditional short-term accommodation, while Wingecarribee LGA has the largest representation of available sharing economy accommodation rooms.

Collectively across short-term and sharing economy accommodation types, there is approximately 2,198 available rooms Scenario 2.

Table 6.2 Supply by location for Scenario 2

Locality (LGA)	Traditional Short-Term Accommodation Rooms		Share Economy Accommodation Rooms		Total	
	Number	%	Number	%	Number	%
Upper Lachlan	70	10.4%	95	6.2%	165	7.5%
Wingecarribee	246	36.9%	1,187	77.6%	1,433	65.2%
Yass Valley	122	18.3%	110	7.2%	232	10.6%
Queanbeyan-Palerang	230	34.5%	138	9.0%	368	16.7%
Total	**668**	**100.2%**	**1,530**	**100.0%**	**2,198**	**100.0%**

Source: Umwelt, 2025

6.1.3 Summary

Therefore, in both Scenarios (1 and 2), it is predicted that there is sufficient availability to house the Project's temporary construction workforce in short-term and sharing economy accommodation types within an approximate 1 hour drive time radius of the Project site (refer to **Table 6.3**).

Table 6.3 Summary of Accommodation Options by Sceanrio

Accommodation Type	Number Housed
Scenario 1	
Available accommodation[3]	2,699 bedrooms
Incoming workforce	238 people
Total Surplus Accommodation	**2,461**
Scenario 2	
Available accommodation	2,198 bedrooms
Incoming workforce	238 people
Total Surplus Accommodation	**1,960**

Source: Umwelt, 2025

In the case of both scenarios, the workforce would also be able to be distributed across the relevant LGAs, based on accommodation supply available, as outlined in **Table 6.4**.

Table 6.4 Proposed Distribution of Incoming Construction Workforce

LGA	Accommodation Supply		Incoming Workforce
	Number of Rooms	% of Supply	Number of Workers
Scenario 1			
Golburn-Mulwaree	501	18.6%	44
Upper Lachlan	165	6.1%	15
Wingecarribee	1,433	53.1%	126
Yass Valley	121	8.6%	20
Queanbeyan-Palerang	368	13.6%	32
Scenario 2			
Upper Lachlan	165	7.5%	18
Wingecarribee	1,433	65.2%	155
Yass Valley	232	10.6%	25
Queanbeyan-Palerang	368	16.7%	40

Source: Umwelt, 2025

6.2 Reducing Cumulative Impacts

The analysis presented outlines that Scenario 1 would require approximately 9.7% of available rooms, while Scenario 2 would require approximately 12.1% of available rooms to house the Project's peak construction workforce.

[3] Includes traditional short term accommodation and Airbnb

It is also understood that the Project's construction workforce would be competing for available rooms with other development projects underway within the region, particularly other State Significant Developments. Given current understanding of other project construction timeframes, it is suggested that cumulative impacts are unlikely to be experienced given the levels of accommodation supply available. However, it should be noted that further prescription around cumulative project development is required.

Current vacancy rates also demonstrate existing demand for accommodation within the defined study area, that is housing currently used by other industries e.g. visitors/tourism, social and professional services etc. Additional cumulative demand from these sectors would only be expected if the tourism and/or demand from social/professional services were to increase beyond the current rates.

Should cumulative demand issues arise, several considerations are noted below that may assist in alleviating strain on the current short-term accommodation market. These considerations are in addition to management measures already outlined in the Accommodation and Employment Strategy (Umwelt, 2024).

6.2.1 Utilisation of Accommodation Options in Canberra

While not explicitly explored in the Accommodation and Employment Strategy (Umwelt, 2024), Canberra is located within a 1-hour drive distance of the Project site. It is proposed that short-term accommodation options in Canberra only be considered where impacts to accommodation supply cannot be sustainable managed within the defined locality. However, if required, Canberra offers a range of short-term accommodation options that could be utilised.

6.2.2 Consideration of Key Event Timing

Based on the information presented in **Section 3.0**, the Project Team should consider planning peak construction workforce activities within winter months, as there is expected to be less demand for temporary short-term accommodation at these times. As has been noted, the region hosts a range of events during the calendar year, and where possible large events requiring accommodation for visitors/tourists should be avoided if possible.

6.2.3 Avoidance of Accommodation Options within the Goulburn-Mulwaree LGA

Given feedback from Council, accommodation scenario 2 has also assessed whether sufficient accommodation would be available to the Project's peak construction workforce, if accommodation options within the Goulburn-Mulwaree LGA were not available. The scenario assessment has indicated that the incoming construction workforce for the Gundary Solar Farm Project could be housed in adjacent LGAs.

6.2.4 Resource Provision – Local Accommodation Coordinator

In Goulburn Mulwarree Council's Review of the Response to Submissions & Amendment Report (2025), Council suggested the funding of a local coordination role to assist with managing accommodation and event scheduling. It was suggested that this role be co-funded by other project proponents seeking to undertake construction in the LGA. It was further suggested that this role could be embedded in existing organisations such as the Canberra Regional Joint Organisation, or Regional Development Australia Southern NSW and ACT, or be established as a new resource within Council.

6.2.5 Additional Considerations

There is an estimated 1,025 peak cumulative construction workforce planned within the locality at the time the Gundary Solar Farm project construction is likely to commence (if approved). However, there are a range of other factors that may contribute to greater demand for accommodation. These include:

- Local employment targets proposed for other SSD projects.
- Development and use of temporary workers camp accommodation and on-site accommodation associated with other Projects.
- Specific Project site locations and defined social localities relevant to these projects (e.g., assumptions regarding drive time analyses).
- Uncertainty in relation to other project schedules in relation to assessment and construction phases.

Given current understanding of project timing, it is unlikely that the predicted peak cumulative construction workforce associated with project development in the region, will be competing for the same accommodation/rooms outlined in this report.

Appendix A

Review of Response to Submissions and Amendment Report

umwelt

A.1 Project Timing and Worker Accommodation

While the lodged EIS acknowledged there would be some unavoidable impacts, there are two key changes to the proposed project that will increase the impact on the Goulburn Mulwaree LGA.

1. The change to the timing of the project; and
2. The reduced local employment target from 35% to 5%.

The updated construction timing is showing a start date of Q4 2025/Q1 2026 with construction anticipated to last 18-24 months (January 2026 - June/December 2027). This also assumes a construction workforce of 400.

In April 2025, following delays with property acquisition and site access in Bannaby, HumeLink East changed their construction approach to commence from the western end of the project. As a result, while the construction workforce is reduced, it will now be centered around the period June 2026 to June 2027 and the workforce accommodated in the Goulburn Mulwaree and Upper Lachlan Shire LGAs rather than in camps located within the Upper Lachlan LGA. Their average peak workforce of 100-140 will be required from June 2026 to February 2027.

The Marulan Solar Farm is estimated to commence in 2025 and take 18 months, also crossing into the amended timeframe. This project estimates a workforce of 300 during construction.

While the amendment report provides detailed information in Tables 2.4, 2.5 and 2.6 on available accommodation during the project period, HumeLink also has accommodation requirements listed in its SIMP. This includes reserving 225 rooms in Goulburn for the stated period.

With a limited number of rooms available in the LGA, there will be significant pressure placed on the short-term accommodation market's ability to also accommodate our tourism and overnight stay visitors should rooms be allocated for both projects during this period.

Information that Council have provided to other projects in respect to accommodation shortages includes:

- Consideration must be given to times when locally significant events in Goulburn or surrounds are taking place that rely heavily on the availability of accommodation. Examples of events that have been conformed during the anticipated construction period include but are not limited to the IOGKF Gasshuku in November (500+ people travelling from around Australia and internationally), Goulburn Racing Club race meetings and a school reunion (100+).
- A number of regular events can fill all existing accommodation. For example, State Championship Hockey, Police Academy attestation parades and Motor Sport events at One Raceway. Not being able to accommodate for these events will negatively impact the local visitor economy, including the ability to maintain some of these events as regular and return attractions to the LGA. Page 3 of 4
- Council is concerned that Goulburn is likely to experience a number of SSD developments entering the construction phase at once, substantially increasing the risk of losing all available short-term accommodation to projects not necessarily in our LGA. For example a number of SSD projects are being proposed within the Upper Lachlan LGA that will rely upon the services found within Goulburn (including accommodation).
- There should also be consideration given to regular accommodation users such as healthcare workers, ARTC, Essential Energy and other civil contractors and trades.

The amendment report also states that the local employment target has been reduced to 5% from 35% following stakeholder engagement and assessment. We appreciate the acknowledgement that consultation with Goulburn Mulwaree Council to inform the AES highlighted limited local employment capacity at the present time, due to low unemployment, a tight construction market, limited skilled workforces, with local businesses currently struggling to fill roles. However, by reducing this percentage to 5%, there will be additional workforce then requiring accommodation. Which will then add to the issues highlighted above.

Suggested mitigation measures that have been provided to other proponents include the funding of a local coordination role (modelled on 'Orange360' - cited as a useful precedent for workforce and accommodation coordination in regional areas) for accommodation and event scheduling. This regional coordination role could be jointly or solely funded by approved SSD projects. This role could be embedded in an existing body, such as the Canberra Region Joint Organisation, or Regional Development Australia Southern NSW and ACT, or established as a new initiative, to proactively manage cumulative social and workforce impacts across affected LGAs.

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Appendix C

Traffic Assessment

Gundary Solar Farm (SSD-48225958)

Amended EIS Transport Impact Assessment

Prepared for:

Lightsource bp

24 February 2026

The Transport Planning Partnership

Gundary Solar Farm (SSD-48225958)

Amended EIS Transport Impact Assessment

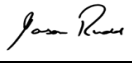
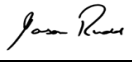
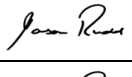
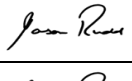
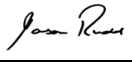
Client: Lightsource bp

Version: V06

Date: 24 February 2026

TTPP Reference: 23042

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	19/02/2024	C. Hanna	J. Rudd	J. Rudd	
V02	01/08/2024	J. Rudd	J. Rudd	J. Rudd	
V03	6/06/2025	C. Hanna	J. Rudd	J. Rudd	
V04	17/06/2025	C. Hanna	J. Rudd	J. Rudd	
V05	20/02/2026	C. Hanna	J. Rudd	J. Rudd	
V06	24/02/2026	C. Hanna	J. Rudd	J. Rudd	

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APPENDICES

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1 Introduction

1.1 Background

An Environmental Impact Statement (EIS) for Gundary Solar Farm, including a Transport Impact Assessment (TIA, August 2024), was submitted to the Department of Planning, Housing and Infrastructure (DPHI), and publicly exhibited in late 2024.

During the exhibition period, a total of 174 submissions were made on the Project. This included submissions from Transport for NSW (TfNSW) and by Goulburn Mulwaree Council (GMC) in relation to the TIA (August, 2024).

A response to the traffic related issues raised by TfNSW and GMC were provided by TTPP in an Amended TIA (June 2025).

Further responses and requests for information have been submitted by TfNSW and GMC following consideration of the Amended TIA (June 2025).

The responses and clarifications to the further responses from TfNSW and GMC are provided in this Amended TIA (February 2026). Details of the requested further information and where they have been addressed in this Amended TIA (February 2026) are set out in Section 1.4 below.

1.2 Project Overview

Lightsource Development Services Australia Pty Ltd (Lightsource bp) proposes to develop the Gundary Solar Farm (the Project) in the Southern Tablelands of New South Wales (NSW), approximately 10 kilometres (km) southeast of Goulburn within the Goulburn Mulwaree Local Government Area (LGA). The location of the Project and its regional context is presented in Figure 1.1.

The Project will involve the construction, operation, maintenance and decommissioning of a 400 Megawatt peak (MWp) solar farm with a Battery Energy Storage System (BESS) of up to 555 MWp and 1,570 Megawatt hour (MWh) capacity and associated infrastructure to connect the Project to the national electricity grid.

The Project will be accessed from Windellama Road off the Hume Highway, at 961 Windellama Road. Intersection works on Windellama Road are proposed as part of the Project to upgrade the Project access to accommodate heavy vehicles. The Project's conceptual layout is included in Figure 1.2.

Figure 1.1: Locality and Regional Context

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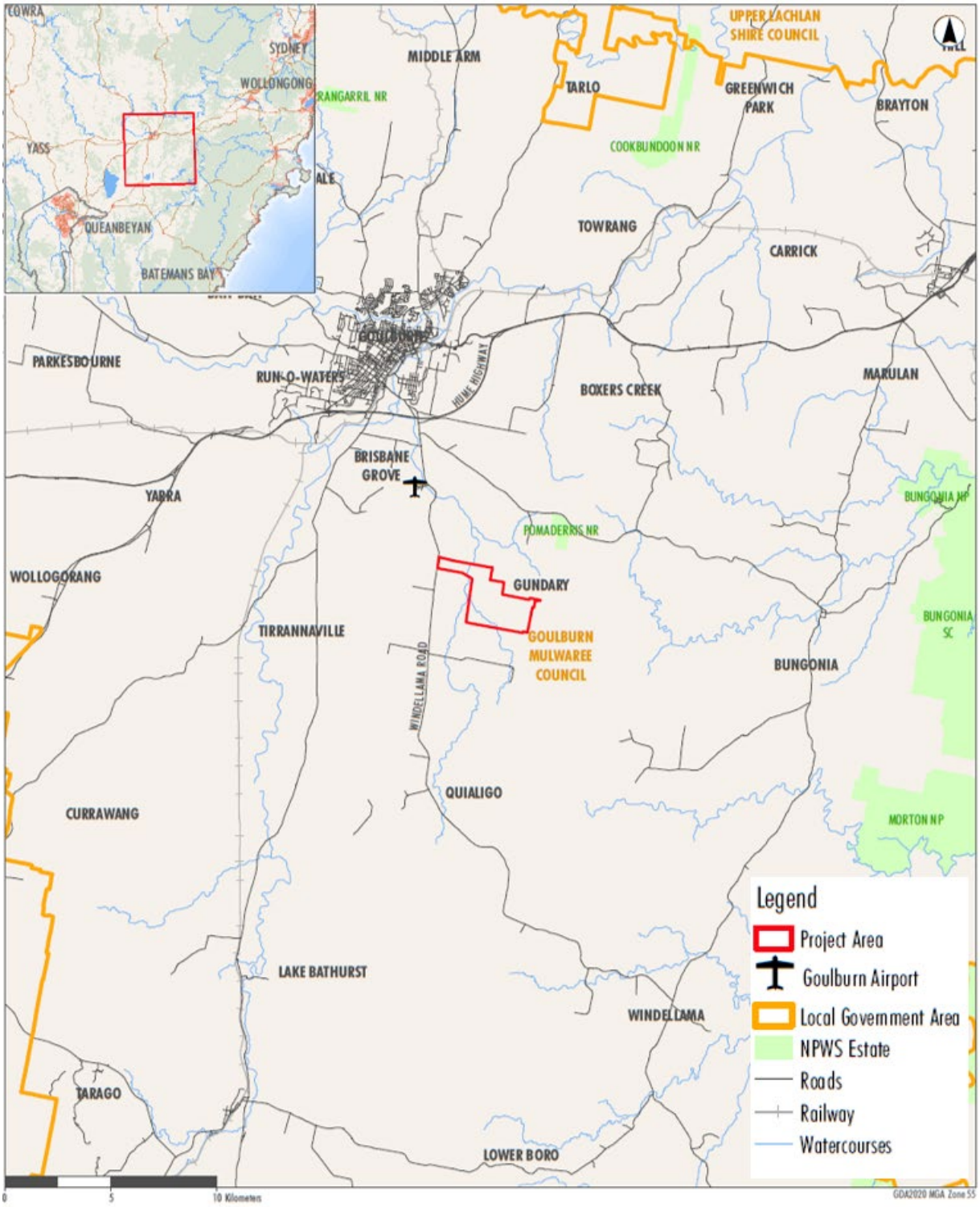
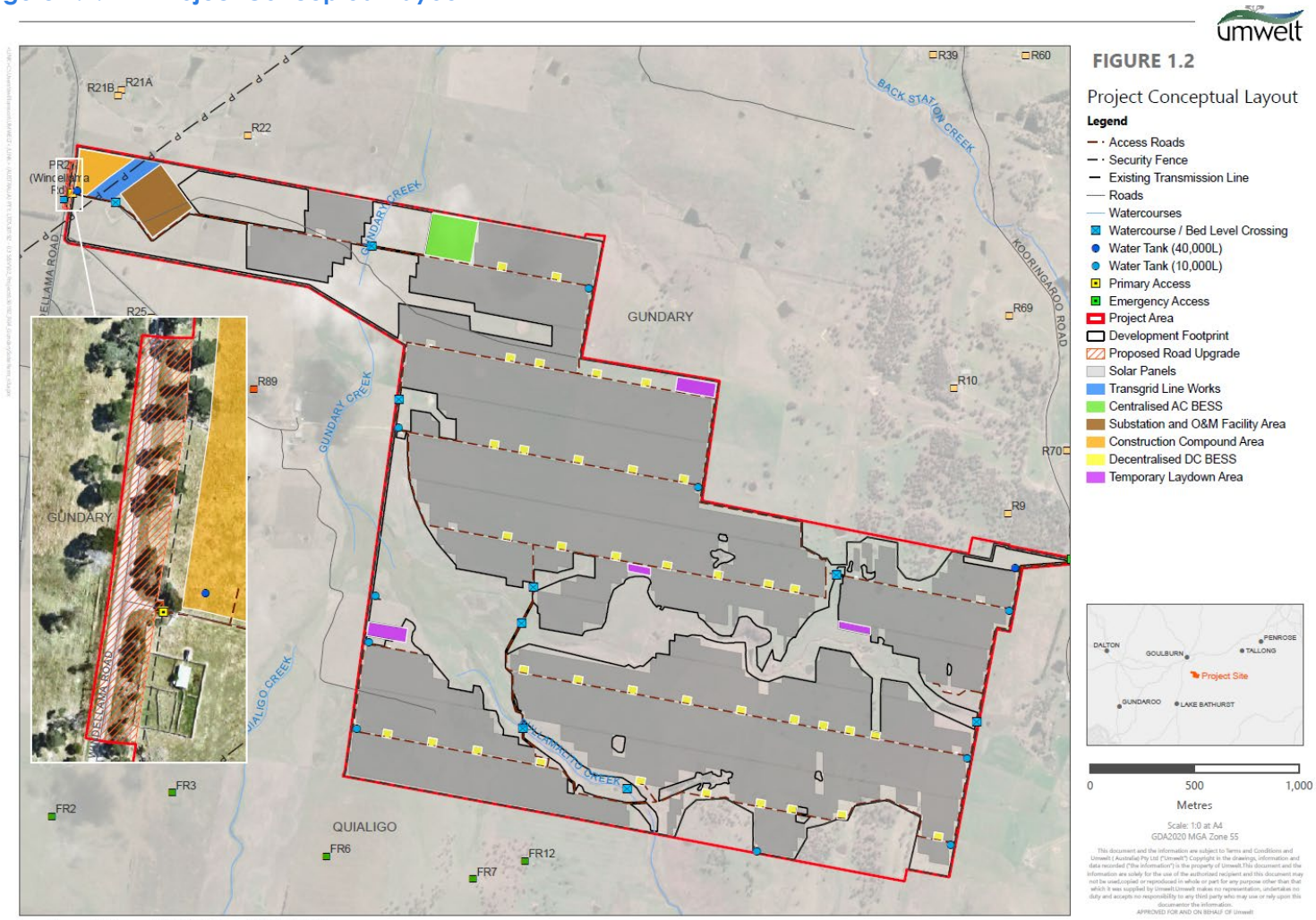


Figure 1.2: Project Conceptual Layout



The Project will supply electricity to the National Electricity Market (NEM), via a new onsite connection to the existing 330kV overhead transmission line traversing through the north-west corner of the Project Area. The Project will generate enough clean energy for about 133,000 homes and reduce carbon emissions by 670,000 tonnes. The BESS will have capacity to store up to 1,570 MWh of on-demand energy for supply to the grid.

The Project would be located on land zoned RU1 – Primary Production. The area surrounding the Project is characterised predominantly by agricultural lands associated with rural residential properties, small settlements, conservation areas and rural tourism. Land within and adjacent to the Project has been subject to extensive cultivation associated with historic and more recent agricultural land uses.

The Project will be developed across five freehold lots, covering an area of approximately 702 ha (the Project Area). These properties are primarily used for grazing activities. The Project Area also includes a small section of Windellama Road for proposed intersection works to upgrade the Project access to accommodate heavy vehicles. The Project infrastructure will cover approximately 512 ha (the development footprint).

The Project is expected to generate up to 400 Full Time Equivalent (FTE) jobs over the 18-to-24-month construction period with up to four FTE jobs during operation.

The Project is a State Significant Development (SSD) under the *State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP)* as the capital value of the Project is over $30 million. A development application (DA) for the Project is required to be submitted under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Some modifications have been incorporated into the proposed Project scope of works to reflects comments from various agency and community responses. With regard to the Amended TIA assessment these modifications include:

- Refinement of worker housing strategy to reflect GMC response to reduce the pressure on local housing supplies. This modification has changed the travel distribution patterns of worker trips to and from the Project site; and
- Refinement of Oversize Overmass (OSOM) vehicle routes and associated infrastructure works to accommodate OSOM vehicles.

The details of these modifications and the assessment of their implications are discussed further in following sections of this Amended TIA.

1.3 Transport Assessment – Scope and Methodology

This Amended *Transport Impact Assessment* (TIA) report has been prepared by The Transport Planning Partnership Pty Ltd (TTPP) to accompany the Submissions report prepared as part of the SSD Application (SSD-48225958) for the Gundary Solar Farm (the Project).

This Amended TIA report presents the findings of TTPP's assessment of the traffic aspects of the Project in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued by the then Department of Planning, Industry and Environment (DPIE) on 10 November 2022. It is noted that DPIE has changed their name to the Department of Planning, Housing and Infrastructure (DPHI). DPHI will be used as the reference to the department in the following sections of this document.

Furthermore, this Amended TIA (February 2026) report has been amended and updated to incorporate the following:

- TfNSW EIS and TIA response submission (11 December 2024)
- TfNSW Amended TIA response submission (14 August 2025)
- GMC EIS and TIA response submission (18 December 2024)
- GMC Amended TIA response submission (15 August 2025)

The transport assessment undertaken by TTPP investigated the traffic implications associated with construction, operation and decommissioning of the Project.

The scope and methodology utilised by TTPP in the preparation of this Amended TIA included the following:

- Review of background information;
- Project team discussions regarding construction, operation and decommissioning phases of the project;
- Consultation with TfNSW and GMC;
- Inspections of the Project site and surrounding road network, specifically inspections of the proposed construction vehicle routes between the Project site access and the Hume Highway;
- Traffic surveys (2023) and SIDRA modelling of key intersections along the potential construction vehicle routes;
- Estimated the traffic generation and distribution of Project related traffic for construction, operation and decommissioning phases of the project; and
- Assessment of the potential traffic impacts, including cumulative impacts, to the surrounding road network associated with the Project and identification measures to mitigate identified implications.

1.4 Environmental Assessment Requirements

1.4.1 Secretary's Environmental Assessment Requirements

As noted above, the Secretary's Environmental Assessment Requirements (SEARs) were issued for the Project by (DPHI) on 10 November 2022.

The specific requirements (SEARs) for the traffic assessment and where these requirements have been addressed in this TIA report is summarised in Table 1.1.

Table 1.1: Traffic Related SEARs for the Gundary Solar Farm Project

Traffic related SEAR	Where Addressed in This TIA Report
DPHI	
An assessment of the peak and average traffic generation, including over-dimensional vehicles / heavy vehicles requiring escort and construction worker transportation;	Section 5
An assessment of the likely transport impacts to the site access route(s), site access points, any Crown land, particularly in relation to the capacity and conditions of the roads, road safety and intersection performance;	Section 2 and Section 5
A cumulative impact assessment of traffic from nearby developments; and	Section 5.9
Provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes)., road maintenance contributions, and any other traffic control measures developed in consultation with the relevant road authorities.	Section 6
TfNSW	
Prepare a Traffic Impact Study	This Report
Strategic / Concept Design of road network improvements	Section 2.3 Section 5.4
Reflection	Section 5.13
Driver Code of Conduct	Section 6.3
Consultation with TfNSW	Section 1.2 Section 1.4.2
GMC	
Safety and Route Selection for construction vehicles	Section 5.1 Section 5.2 Section 5.3 Section 6.3
Potential damage to road network, need for maintenance and renewal plan	Section 6.4
Implications of the Goulburn Floodplain	Section 5.14

1.4.2 Transport for NSW Responses

As noted above, TfNSW has reviewed the EIS prepared by Umwelt dated 14 October 2024 and Appendix 14 – Transport Impact Assessment (TIA) prepared by TTPP dated 1 August 2024. Based on the review TfNSW provided a response and requested additional information.

A further response was provided by TfNSW (14 August 2025) to the Amended TIA (June 2025). This response highlighted items which had been addressed to the satisfaction of TfNSW and

which items required further consideration. The specific requirements for further traffic related information and where these requests have been incorporated and assessed in this amended TIA report are summarised in Table 1.2.

Table 1.2: TfNSW Response and Requests for Further Information (RFI)

TFNSW Issue Raised in Response to EIS / TIA	TfNSW Response in Relation to Response to Submissions (RTS) / amended TIA and request for further information for revised TIA	TTPP Response / Comment	Where Addressed in this Amended TIA Report
Key Issue 1 – Concept Level Route Analysis required for High Risk OSOM vehicles The route assessment is required for high risk OSOM (as defined on TfNSW website) delivering components to the project. The concept level route analysis must include: a) Port or Point of Origin to Site route assessment for OSOM movements b) OSOM vehicle specifications c) OSOM load specifications d) Swept path analysis for OSOM vehicles e) Bridge assessments on OSOM routes f) Identification of at risk structures on OSOM routes and proposed mitigation measures and road upgrades g) Mitigation measures for known impacts to road users h) Identify risks to known road / rail projects on the OSOM routes - Consistency with EnergyCo P2R project	**OPEN** - Route Analysis provided optioning Port Kembla and Port Botany. Refer to comments below within 1 f, h, and i for specific actions that are required to be addressed for the Port Kembla and Port Botany routes a) CLOSED b) CLOSED c) CLOSED d) CLOSED – Transformer laden configuration has been provided within the revised TIA. e) CLOSED – Post consent requirement to identify pullover bay locations with suitable swept paths to ensure suitable locations for fatigue management. f) OPEN – Bridge assessments still have not been provided. For TfNSW assets these can be provided by SPU. See advisory note. g) CLOSED – Swept paths provided h) OPEN – The Port Kembla Route incorrectly identifies the height restriction at the University Bridge. This is posted as 4.9metres on the bridge however the route study notes this as a 5.2m clearance, see Attachment 2. The proponent is to ensure that the vehicle will pass safely. If required investigation of lowering for the movement is to undertaken. The proponent will also need to ensure bridge assessments are completed for the route. The Port Botany route includes a number of bridges that assessments have not been provided. The proponent is also to provide a full assessment of clearance issues along the route to ensure there are no discrepancies as identified above.	Matters pertaining to the movement of OSOM vehicles for the project have been addressed separately through a concept level route analysis undertaken by the ARES Group transport logistic specialists. The TfNSW RFI's have been addressed in the updated Gundary Solar Farm – OSOM Route Study prepared by ARES Group (Rev2 dated 28/10/2025). Bridge assessments have been requested from TfNSW in November 2025 and are in progress (TfNSW reference is PT3059). Strategic Intersection Designs have been prepared by BG&E identifying intersection treatments to accommodate OSOM vehicles based on the ARES Route Study. It is noted that TTPP have prepared swept path analysis for non-OSOM construction vehicles accessing the Project site. These are presented in Appendix D.	Appendix F & G

TFNSW Issue Raised in Response to EIS / TIA	TfNSW Response in Relation to Response to Submissions (RTS) / amended TIA and request for further information for revised TIA	TTPP Response / Comment	Where Addressed in this Amended TIA Report
Key Issue 2 – Traffic Generation and Distribution			
Traffic volumes: a) Project-related traffic volumes (measured as vehicle trips per an hour and per a day) for each stage including pre-construction, construction, operation, and decommissioning and identifying peak period(s) for traffic volumes. b) Table 5.2 of the TIA show hourly construction traffic, which includes 63 light vehicles outbound at midday (12-1pm) and only 32 light outbound in PM peak hour (3-4pm). c) No information has been provided on the directional splits of construction traffic on the road network. Confirm which direction is the construction traffic coming form to the site, and if it is all accessing from Goulburn. d) The SIDRA analysis is to be revised to include all the traffic generation as not all the traffic generated has been included in the SIDRA intersection analysis. e) Background traffic growth is to be applied to the existing traffic count to the year of peak construction. f) Show the project traffic added to each intersection that has been analysed in the TIA.	a) PARTIALLY ADDRESSED - Proponent is to clearly label raw data for the intersection of Braidwood / Bungonia and Braidwood / Sloane in the appendix. b) OPEN – Table 5.2 has not been updated to demonstrate the hourly traffic. c) OPEN – Turning volumes provided in the appendix however the volumes of the growth rate applied background traffic and the Gundary Solar Farm traffic have not been plotted. Further to this point, two routes are currently identified within Goulburn to accommodate the project construction traffic, within s3.1-Road network within the TIA prepared by TTPP (dated 17 June 2025), both routes will use Sloane Street, Braidwood Road, Bungoria Road, however, it isn't clear how the traffic will be distributed at each of these intersections based on the chosen route (i.e will all traffic turn left or right at these intersections or be evenly distributed) if both routes are used for project traffic. TfNSW requests that the revised TIA include the direction and distribution of project traffic that will use each route in the AM/PM peak hours at the intersections with the state road network. The traffic and SIDRA analysis is to be revised based on the confirmed traffic distribution for each route in the AM/PM peak hour.	a) Data labels have been provided to traffic count data provided in Appendix A. b) The proposed hourly construction traffic generation of the Project has been updated and provided in Table 4.2. c) The distribution of Project related traffic has been provided as an additional (Appendix C) within this Amended TIA. With regard to the two routes, the assessment provided herein has assumed that 100% of construction traffic (excluding worker trips) will travel to and from the site via Option 1 (north via Sydney Road) or 100% via Option 2 (from the south via Hume Street). Worker traffic distributions will be the same for Option 1 and 2 and depend on the origins and destinations of their trips.	Appendix B & C Table 4.2 Appendix C

	d) OPEN – SIDRA outputs have been provided however there appears to be discrepancies in the output provided. The 2027 Base SIDRA analysis for Braidwood Road South East indicates a Level of Service of Service of F, however the 2027 Base plus Gundary Solar Farm South East Braidwood Rd indicates a Level of Service of B. The proponent is to clarify this discrepancy and ensure that the data for all intersections is correct and mitigation measures reflect the outcomes of the analysis. Please provide the electronic SIDRA files in the response to TfNSW. e) CLOSED - A growth rate of 2% per annum has been applied to the surveyed 2023 data. The proponent is to ensure the analysis provided considers a worse case scenario of the network background AM and PM peaks occurring at the same time as the Gundary construction project data. Proponent is to consider offsetting start times as a mitigation measure to reducing impacts to the urban roads around Goulburn. f) OPEN – Proponent is to confirm and clearly label the raw traffic data for the intersection of Bungonia / Braidwood and Braidwood / Sloane Street that has been used in the intersection analysis.	d) All SIDRA intersection files have been updated with the adjusted traffic generation and distributions arising from the above. Electronic files will be provided to TfNSW as requested. e) The growth rate of 2% pa has been maintained in the updated SIDRA analysis. The Project proposes to restrict construction traffic using Option 1 during school hours to avoid potential conflicts with School traffic along the Sydney Road route. f) Data labels have been provided to traffic count data provided in the appendix.	Appendix B & Section 5.5
Origin / Destination and routes to be shown for: - Employee and contractor light traffic - Shuttle buses - Heavy vehicle traffic - OSOM vehicle traffic	PARTIALLY ADDRESSED – Pending electronic SIDRA files being provided: TfNSW notes that turning volumes and routes for light vehicles/heavy vehicles/shuttle buses should be focused to reduce the impact on the state road network, particularly on the intersections of Braidwood / Sloane Street and along Braidwood Road.	The distribution of Project related traffic types has been provided as an additional (Appendix C) within this Amended TIA.	Appendix C
Merino Solar Farm to be excluded from the analysis. TfNSW only requires assessment of cumulative impacts of developments at EIS stage or where approved. As Merino Solar Farm has not yet reached EIS stage it does not need to be included in the assessment.	CLOSED	No change the Amended TIA – CLOSED	Noted. Merino Solar Farm proposal has been excluded from the Gundary Solar Farm traffic assessment.

TFNSW Issue Raised in Response to EIS / TIA	TfNSW Response in Relation to Response to Submissions (RTS) / amended TIA and request for further information for revised TIA	TTPP Response / Comment	Where Addressed in this Amended TIA Report
TfNSW notes that the preferred route from the Hume Hwy to the site is Option 2. Clarity is required if this is the proposed route and is Option 1 is still being pursued. If both options are proposed, then both options are required to be assessed.	CLOSED	NOTED Both Option 1 and Option 2 are feasible options for the Gundary Solar Farm project. The assessment presented herein has, for assessment purposes only, considered the scenario of 100% of Gundary traffic using Option 1 and 100% using Option 2. Option 2 is proposed to be the Primary option for Gundary Solar Farm construction traffic. Option 1 is the preferred OSOM route for OSOM vehicles.	
Shuttle buses have been proposed. Further clarity is required regarding accommodation locations of workforce, routes of travel, shuttle bus locations for pick up and drop off. How will the measure be implemented to ensure that construction workers will uptake the shuttle bus transport to / from site.	CLOSED– The updated TIA will need to specify the routes for shuttle buses to the development considering the impacts on turning movements raised in the points above on the level of service of Sloane / Braidwood and Braidwood Road. The updated TIA is to include mitigation measures to reduce the impacts on Braidwood Road and the intersection of Sloane Street/Braidwood Road. Examples of mitigation measures could be avoiding the network peak hour for project traffic movements, increasing carpooling and shuttle bus participation or staggering project traffic movements.	In response to GMC comments regarding potential pressure on accommodation with Goulburn and the immediate locality, the worker housing strategy has reduced the number of local workers to be employed on site. This reduces the number of single or car share employee trips with a shift to increased shuttle bus trips.	Section 2.4.3 Section 2.4.4 Section 4.2

1.4.3 Goulburn Mulwaree Council

GMC has also provided a submission in response to the EIS exhibition. Traffic related comments by GMC are set out in Table 1.3.

A further submission to the Amended TIA has been provided by GMC. The traffic related comments and TTPP response are provided in Table 1.4.

Table 1.3: Goulburn Malwaree Council Response to EIS and TIA (August 2024)

GMC Traffic related RFI	Where Addressed in this Amended TIA Report
Council's preference for heavy vehicle haulage is via the South Goulburn interchange (proposed Option 2 route).	Noted The OSOM movements will be via option 2. Section 2.4.4 Section 5.1
Delivery of OSOM vehicles and any heavy vehicle truck movements should be restricted to occur outside school bus hours and school drop off times in consultation with the local bus company.	Noted . OSOM and heavy vehicle truck movements will be detailed in the Traffic Management Plan. See Gundary Solar Farm OSOM Route Study (ARES)
Council notes the proposed use of shuttle buses for construction workers. Details to be provided confirming that options are available to accommodate the workers for a shuttle bus arrangement to work effectively is required to be demonstrated.	Section 2.4.3 Section 2.4.4 Section 4.2
Road pavement damage is likely to occur on proposed haulage routes and it is recommended that either road maintenance contributions be sought for the local roads used as part of the haulage route in accordance with Council's adopted plan or that the proponent enter into an agreement to undertake a preliminary dilapidation report on the roads and agree to upgrade to the required standard and repair any accelerated damage. A detailed pavement analysis will be required by Council for local roads prior to any works commencing to establish the life and condition.	Noted Section 6.4
Access to the development is proposed by an upgraded entry at the existing property entrance, 961 Windellama Road. As the majority of traffic during the construction and operational phases of the project will be to and from Goulburn a Basic Left Turn (BAL) treatment is proposed and is considered appropriate. Safe Intersection Sight Distance (SISD) is available on each approach to the entry point. It is proposed to construct the upgraded entry at the commencement of the project to facilitate heavy vehicle turning movements. A Section 138 Roads Act 1993 application with accompanying design plans is required to be lodged with Council as the Road Authority for assessment prior to commencement of construction.	Noted. A Section 138 will be lodged with GMC at the appropriate time. Section 2.3 Section 5.4

Table 1.4: Goulburn Malwaree Council Response to Amended TIA (June 2025)

	GMC Traffic related RFI	Where Addressed in this Amended TIA Report
1.	In the event that consent is granted, delivery of oversize and/or overmass (OSOM) and any heavy vehicle or single unit truck movements should be restricted to occur outside school bus hours and school drop off times in consultation with the local bus company.	Noted. The Project proposes to restrict construction vehicles from uses Option 1 (northern access via Sydney Rd during School Hours to avoid conflicts with schools on this route)
2.	The heavy vehicle component will increase the likelihood of road pavement damage. Therefore in the event that consent is granted, it is recommended that either road maintenance contributions be sought for the local roads used as part of the haulage route in accordance with Council's adopted Local Infrastructure Contributions Plan or that the proponent enter into an agreement to undertake a preliminary dilapidation report on the roads and agree to upgrade to the required standard and repair any accelerated damage. A detailed pavement analysis will be required by Council for local roads prior to any works commencing to establish the life and condition.	Noted
3.	Access to the development site is proposed by an upgraded entry at the existing property entrance, 961 Windellama Road. As the majority of traffic during the construction and operational phases of the project will be to and from Goulburn, a Basic Left Turn (BAL) treatment is proposed and is considered appropriate. Safe Intersection Sight Distance (SISD) is available on each approach to the entry point. It is proposed to construct the upgraded entry at the commencement of the project to facilitate heavy vehicle turning movements. A Section 138 Roads Act 1993 application with accompanying design plans is required to be lodged with Council as the Road Authority for assessment prior to commencement of construction.	Noted

2 The Project

2.1 Project Site Location

The proposed Gundary Solar Farm (the Project) site covers approximately 702 hectares of land located some 10 km south (south-east) of the township of Goulburn.

The location of the Project site is shown in Figure 1.1.

The Project area is bounded by Windellama Road to the west and Kooringaroo Road to the north-eastern corner of the Project site. Properties to the north, east, south and west of the Project site are rural residential properties with agricultural land uses.

2.2 Proposed On-site Facilities

During the operational phase of the Project, the on-site facilities and infrastructure will include:

- 660,000 solar panels (approximate)
- A lithium-ion BESS to store energy generated by the Project, comprising one of the following options: 325 MWp/650 MWh centralised alternating current (AC) BESS. 230 MWp/920 MWh decentralised direct current (DC) BESS. or combined centralised AC and decentralised DC BESS with a total capacity of 555 MWp/1,570 MWh.
- Substation / Switching station with on-site connection to the existing 330kV overhead power lines
- Operation and Maintenance facilities, including staff amenities, car and shuttle bus parking and workshop
- Internal gravel access tracks, including some watercourse crossings (via culverts / bed level crossings to facilitate access across the site
- Primary access point from the existing driveway off Windellama Road, with an upgraded intersection to accommodate heavy vehicles
- Emergency access point via the existing entrance off Kooringaroo Road proposed on the east (for emergencies only)
- Perimeter security fencing, water tanks and lighting.

During construction, temporary construction facilities will be provided on-site including:

- Construction compound with office amenities, parking, storage
- Laydown areas suitable for storing plant and equipment
- Waste management facilities.

Once construction is complete, these temporary facilities will be removed from the Project site and the areas rehabilitated to their previous condition.

2.3 Project Area Vehicle Access

The Project's primary vehicle access is proposed to be located along the Project Area's frontage to Windellama Road.

The Project's primary access would be via the existing driveway which is located approximately halfway along the Project Area's some 460m frontage to Windellama Road as shown in Figure 2.1.

As shown in Figure 2.1, the existing driveway consists of gravel surfaced road shoulders on the turn in and turn out vehicle paths.

Intersection upgrade works are proposed for the Project's primary access at Windellama Road to facilitate access for vehicles associated with the Project's construction, operation and decommissioning stages. The proposed upgrade works are detailed in Section 5 of this TIA report.

In addition to the Project's primary access at Windellama Road, a secondary / emergency vehicle access will be provided at the Project site's existing vehicle access from Kooringaroo Road. The secondary access would only be utilised for emergencies.

Approximately 20 km of internal all weather access tracks would be constructed within the Project's development footprint to provide access to the various areas of the Project site for construction as well as on-going operations and maintenance.

The access tracks, comprising of compacted gravel, would be approximately 4 m wide with turning bays for emergency vehicles, and main access track of 6 m wide to allow for the safe delivery, unloading and installation of key components.

Figure 2.1: Project Primary Site Access (Proposed) – Windellama Road

Source: www.nearmap.com (accessed 5/2/24)

2.4 Project Construction

2.4.1 Duration of Works

Construction and commissioning of the Project will take approximately 18 to 24 months, with a peak period of approximately 9 months towards the middle of the construction period.

Project site preparation and Project construction is planned to commence in mid 2027, pending environmental approvals, licensing and completion of design and procurement processes.

2.4.2 Construction Hours

Construction activities associated with the Project are proposed to be:

- 7am to 6pm Monday to Friday
- 8am to 1pm on Saturdays
- No works on Sunday or public holidays.

In general, no construction activities would occur on Sundays or public holidays. Exceptions to these hours would be limited to activities with low noise generation where practicable, emergency works or where required for deliveries or dispatches by an authority due to safety reasons.

GMC and surrounding landholders would be notified of any foreseeable exceptions.

2.4.3 Construction Workforce

It is estimated that the Project will generate up to 400 Full Time Equivalent (FTE) employment opportunities during construction with approximately 250 personnel on site during peak construction with a range of different skills required.

Lightsource bp will engage an Engineering, Procurement and Construction (EPC) Contractor to deliver the Project.

The EPC Contractor will aim to source local sub-contractors and suppliers, where possible and subject to local constraints.

The Accommodation and Employment Strategy developed through the EIS process has identified where workforce for the Project will be sourced (ie. accommodated) and travel to and from the Project site on a daily basis.

The locations of the workforce are summarised in Table 2.1. The locations of workers presented in Table 2.1 have incorporated GMC comments regarding the lack of an available workforce.

A shuttle bus operation is proposed as part of the Project to transport workers to and from the Project site each day. As detailed further in Section 4 of this Amended TIA report, shuttle buses will transport workers from accommodation locations outside of the Goulburn-Mulwaree LGA to and from the site.

The use of shuttle buses will reduce the number of workforce related daily vehicle movements and address issues associated with driver fatigue management.

Table 2.1: Workforce (On Project Site) Accommodation Locations

Locality (LGA)	% Accommodated within Region	Number of Workers
Upper Lachlan	7.5%	18
Wingecarribee	65.2%	155
Yass Valley	10.6%	25
Queanbeyan - Palerang	16.7%	40
Total	**100%**	**238 (say 250)**

2.4.4 Construction Vehicle Routes

The construction phase of the Project will generate a range of different types of construction vehicles. As is detailed further in Section 4 of this TIA report, construction vehicles can be categorised as:

- General Construction Traffic (non OSOM vehicles) – vehicles delivering materials to the Project site
- OSOM vehicles
- Workforce vehicles

The proposed routes for these vehicles accessing the Project site are set out below.

2.4.4.1 General Construction Traffic Routes

While the exact source locations of construction materials, such as quarry products, are yet to be confirmed, viable local and regional sources would see materials being delivered to the Project site from the east, west and / or north of the Project site.

The delivery of materials would therefore access the Project via the Hume Highway.

Two transport routes for the delivery of construction materials between the Hume Highway at Goulburn and the Project site have been considered as part of the planning process.

These two route options essentially seek to utilise either the 'northern' or 'southern' Goulburn exit from the Hume Highway and then use a combination of roads to access Windellama Road and the Project site.

These two routes (see Figure 2.2) are described as:

- **Option 1**: Hume Highway - Sydney Road – Reyolds Street – Grafton Street - Sloane Street – Braidwood Road - Bungonia Road - Windellama Road
- **Option 2**: Hume Highway - Hume Street - Garroorigang Road – Sloane Street - Braidwood Road – Bungonia Road - Windellama Road.

As will be assessed further in Section 5 of this TIA report, both Option 1 and Option 2 are considered to be feasible transport routes for the delivery of construction materials.

However, through consultation with GMC and TfNSW, Option 2 using the southern Goulburn Exit at the Hume Highway has been identified as the preferred transport route option for the Project.

It is proposed that the "southern" route (Option2) will be the primary construction vehicle haulage route for the Project. The "northern" (Option 1) will be a secondary route and an alternative should there be temporary constraints to haulage via Option 2. It is acknowledged that there would be time restrictions to the use of Option 1, namely no haulage during school pick-up and drop off periods (see Section 5).

2.4.4.2 OSOM Vehicle Routes

Major solar and BESS components would be delivered to either Port Botany in Sydney or Port Kembla south of Wollongong and transported to the Project Area by truck via the Hume Highway (see Figure 2.3).

The available routes between Port Botany or Port Kembla to the Hume Highway are designated as Oversize Over Mass (OSOM) Load Carrying Vehicles Network Approved Roads.

For OSOM vehicle access between the Hume Highway and the Project site, OSOM vehicles would use the same options as general construction traffic, namely via the northern (Option 1) and southern (Option 2) Goulburn exits from the Hume Highway.

As per general construction traffic, the primary route for OSOM vehicles will be via Option 2.

Further details and assessment of the OSOM route options for the proposed haulage of OSOM components for the Project are set out in the Gundary Solar Farm - OSOM Route Study prepared by ARES Group (28/10/2025).

2.4.4.3 *Workforce Vehicle Routes*

Vehicles associated with the transportation of the Project's workforce to and from site will include shuttle buses. Based on the employment strategy set in Section 2.4.3) workforce vehicle movements are anticipated to be in the vast majority to and from the Wingecarribee LGA or north of the site, using Option 1. Workers travelling from Yass, Queanbeyan – Palerang, Upper Lachlan are expected to utilised Option 2 to the south.

2.5 Operation of Project

The operational lifespan of the Project is expected to be approximately 40 years from energisation of the project, with operations commencing in approximately Q1 2029 (assuming a 18-24-month construction period). It is anticipated that up to four FTE jobs would be required during operations.

Throughout operations, ongoing maintenance of the Project Area and infrastructure will be required. The operation of the Project would be largely automatically controlled by the SCADA system with inputs from the meteorology stations and other equipment.

Planned maintenance activities would likely include:

- Routine visual inspections, general maintenance and cleaning operations of the solar arrays and substation, as required.
- Vegetation management including potential sheep grazing and the use of seeding or armouring (i.e. jute mesh) to avoid erosion.
- 24-hour site security response.
- Replacement of equipment and infrastructure, as required.
- Pest and vermin control.
- Livestock operations.

During operations regular lightweight vehicle access will be required with occasional heavy vehicles access (i.e replacing inverters, transformers or components of the BESS).

Figure 2.2: Transport Route Options - Between Hume Hwy and Project Site

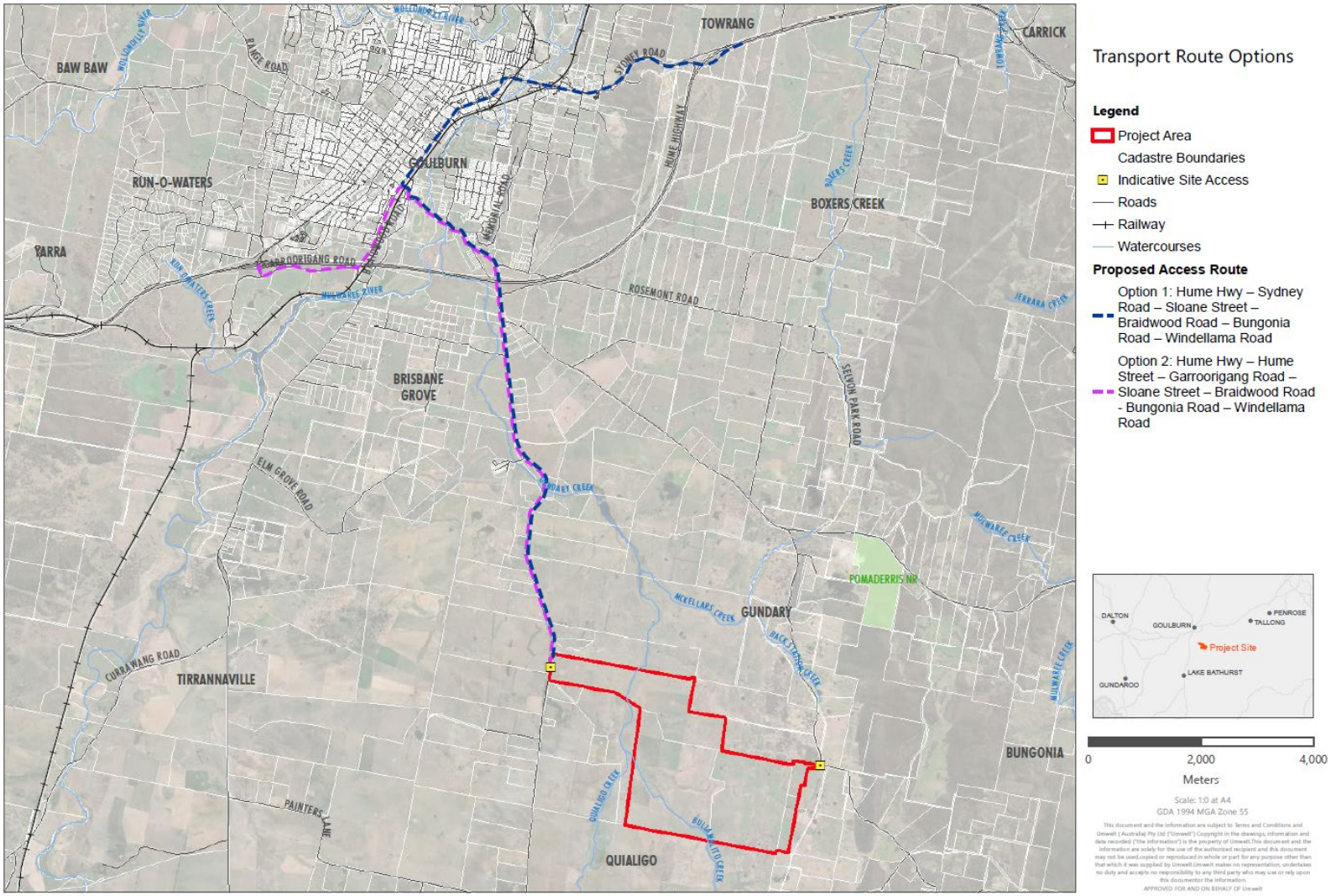
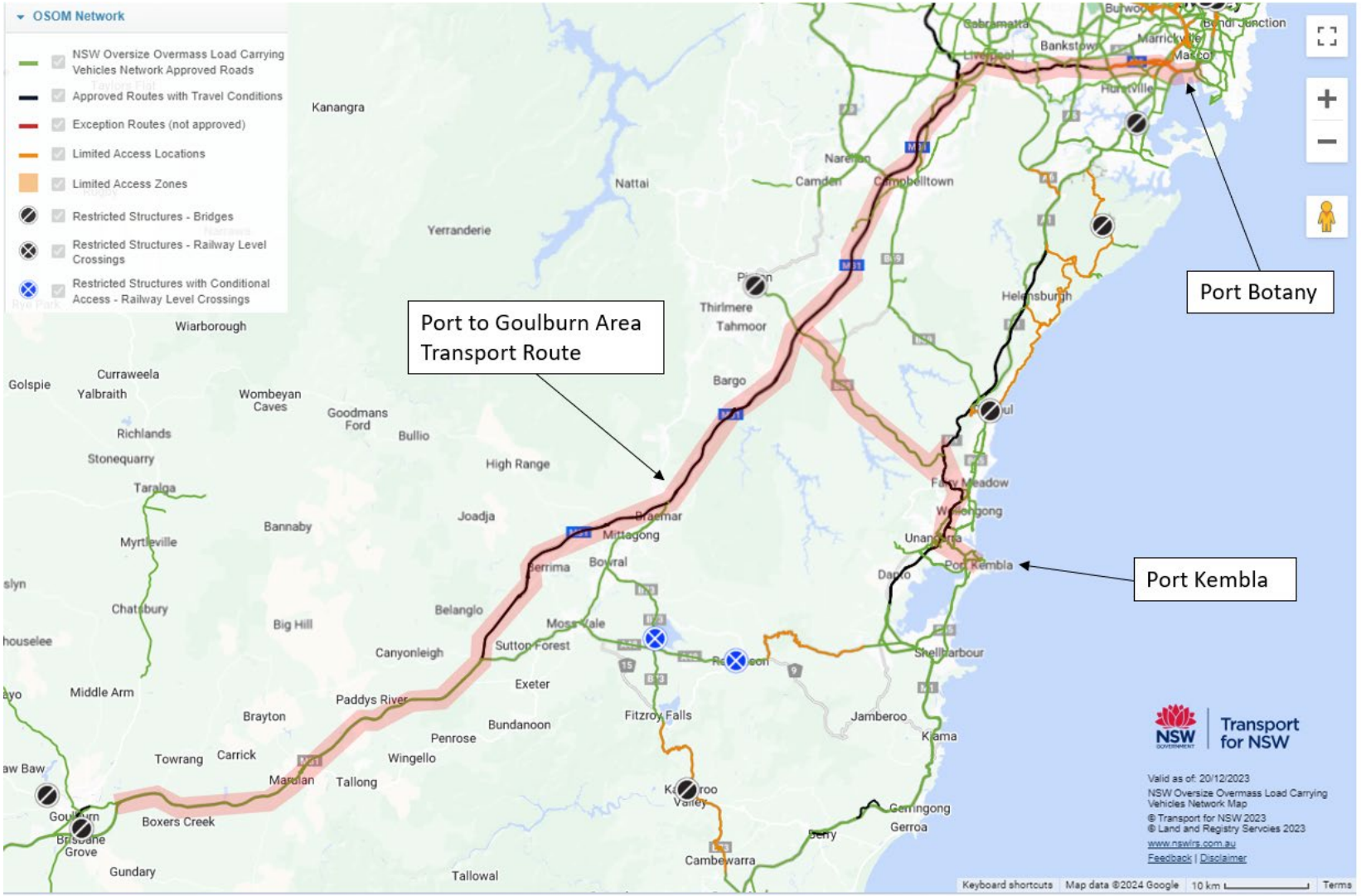


Image Source: ESRI Basemap (2023) | **Data Source:** NSW DFSI (2023)

Figure 2.3: Transport Route Options - Between Port(s) and Goulburn Area



2.6 Decommissioning of the Project

Decommissioning of the Project will occur at the end of its operational life. It is noted that the operational life of the Project may be extended with the facility repowered to continue operation.

A decommissioning plan for the Project and associated infrastructure will be prepared in advance of decommissioning in consultation with the relevant regulatory authorities and landholders.

The basis of the plan will be that the Project and associated infrastructure are to be decommissioned in line with the applicable legislative requirements and best practice guidelines existing at that time. Should the Project be approved, the development consent for the Project will include standard conditions regarding the cessation of operations, decommissioning and rehabilitation of the Project Area.

Lightsource bp or its contractors will seek to recycle all dismantled and decommissioned infrastructure and equipment, where feasible and practicable. Structures and equipment that cannot be recycled would be disposed of at an approved waste management facility in accordance with all statutory requirements.

Vehicle movements and personnel requirements during the decommissioning phase are expected to be similar or less than with the construction phase of the Project.

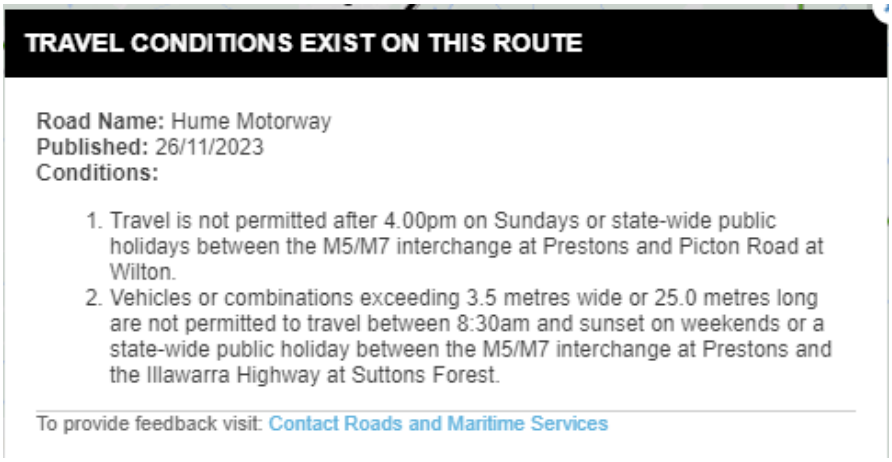
3 Existing Conditions

3.1 Road Network

The proposed transport routes for construction vehicles associated with the Project will comprise both major (National and State roads) and minor roads (Council Roads).

As shown in Figure 2.3, TfNSW approved OSOM vehicle routes are available between Port Botany and the alternative Port Kembla through to the Hume Highway and to Goulburn.

It is noted there are restricted travel times on the Hume Highway for OSOM vehicles between the M5/M7 Interchange at Prestons and the Illawarra Highway (A48). The restriction applies to the following hours:



Source: https://maps.transport.nsw.gov.au/egeomaps/load-carrying-vehicles-network/

For travel between the Hume Highway and the Project site, there are two potential route options, namely:

- Option 1: Hume Highway - Sydney Road – Reyolds Street – Grafton Street - Sloane Street – Braidwood Road - Bungonia Road - Windellama Road
- Option 2: Hume Highway - Hume Street - Garroorigang Road – Sloane Street - Braidwood Road – Bungonia Road - Windellama Road.

As shown in Figure 3.1, Option 1 comprises approved OSOM roads between the Hume Highway through to the intersection of Braidwood Road and Bungonia Road.

Figure 3.2, indicates that Option 2 is not a designated OSOM route between the Hume Highway and Braidwood Road.

Both Option 1 and Option 2 utilise what can be described as a bypass of Goulburn's main street (Auburn Street).

Reynolds Street, Grafton Street, Sloane Street and Garroorigang Road run between the northern and southern exits to Goulburn from the Hume Highway. This bypass route runs along the railway line at the back of the main street.

The roads forming this bypass generally provide a single travel lane in each direction.

Option 1 roads are fronted by a mixture of residential, commercial and retail land uses with a posted speed limit of 60km/h. School zones (40km/hr) apply along Reynolds Street at the St Joseph's Primary School.

Along Option 2, Garroorigang Road is signposted with an 80km/hr speed limit with rural frontages. Sloane Street has industrial frontages transitioning to residential with a sign posted speed limit of 60km/hr. Both Option 1 and Option 2 roads are generally designed to accommodate heavy vehicles with mountable roundabout treatments and wide corner radius.

Bungonia Road, between Memorial Road, is a two-lane two-way rural residential road with kerb and gutter recently constructed along one side of the road and sealed shoulder on the other. Beyond Memorial Road towards the Project site, Bungonia Road becomes a rural road with no kerb and gutter. The posted speed limit along Bungonia Road is 60 km/hr.

The Lansdowne Bridge is located on Bungonia Road and is thus located along the transport route for construction vehicles associated with the Project. The Lansdowne Bridge is identified as a 'restricted structure' by TfNSW. The capacity of the bridge to accommodate Project related construction traffic is assessed in Section 5.2 of this report.

Windellama Road is a rural two-way road with a single travel lane provided in each direction. The posted speed limit along Windellama Road at the Goulburn end is 80 km/hr increasing to 100km/hr south of the Hume Highway.

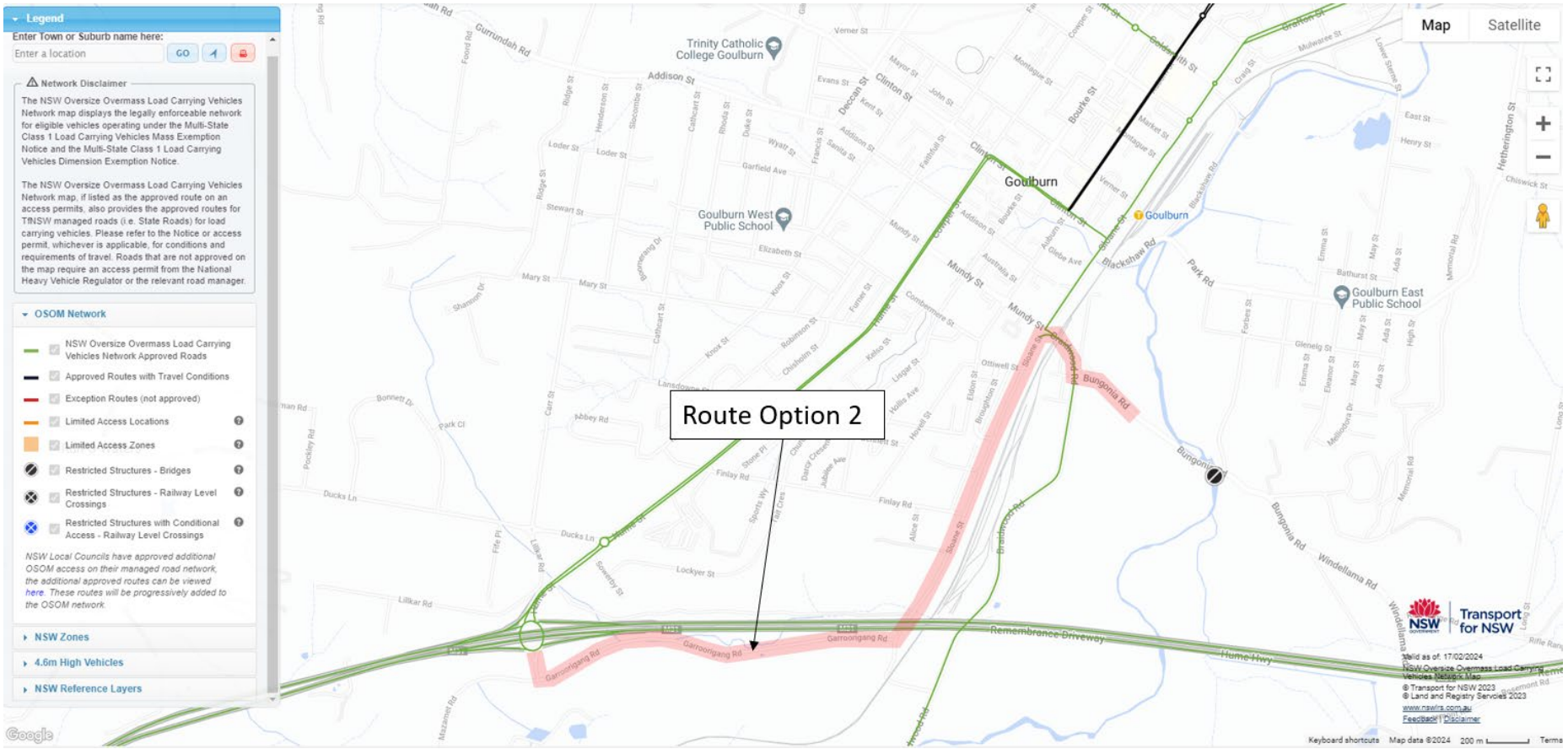
At the proposed Project site access, Windellama Road has a sealed road width of approximately 7m providing one travel lane in each direction.

3.2 Surveyed Road Network Traffic Flows (2023)

To facilitate the assessment of road network operation, traffic flow surveys along the proposed construction vehicle routes were undertaken by TTPP in August and September 2023.

Figure 3.1: Transport Route Option 1 Northern Exit from Hume Highway at Goulburn

Figure 3.2: Transport Route Option 2 Southern Exit from Hume Highway at Goulburn



Peak period turning movement counts were undertaken at the following intersections:

1. Braidwood Road / Bungonia Road
2. Braidwood Road / Sloane Street
3. Bungonia Road / Forbes Street
4. Bungonia Road / Memorial Road
5. Hume Street / Garroorigang Road / Mazamet Road
6. Sydney Road / Union Street / Lagoon Street
7. Sloane Street / Garroorigang Road
8. Windellama Road / Rifle Range Road

An automatic tube count (ATC) was also undertaken on Windellama Road at the proposed Project site access.

The locations of the traffic surveys are shown in Figure 3.3.

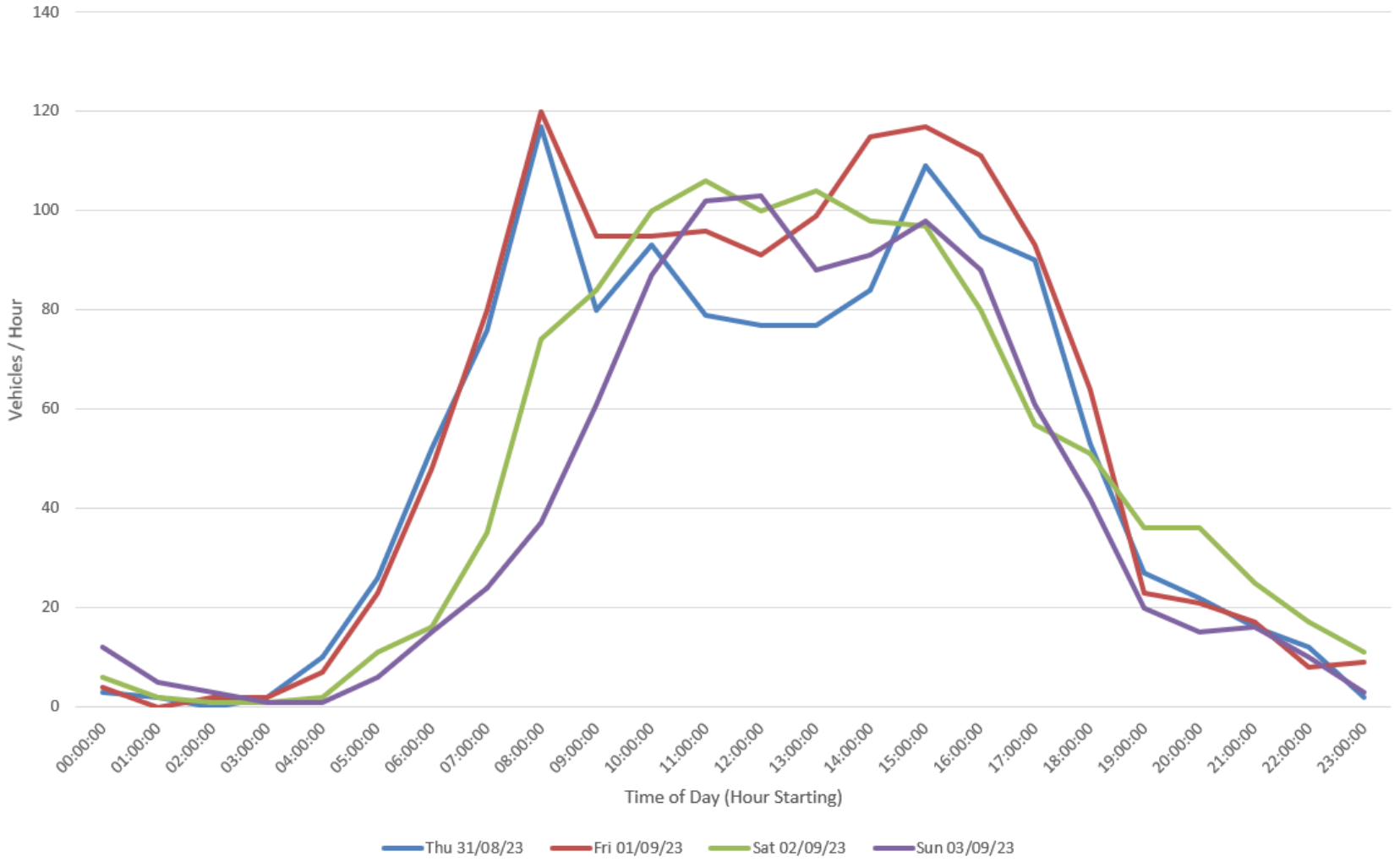
The surveyed two-way traffic flows along Windellama Road at the proposed Project site access are summarised in Figure 3.4.

The surveyed flows indicate that Windellama Road carries a maximum of 120 vehicles per hour (two-way) at the Project site access. This two-way peak occurs on weekdays between 7am-8am and between 3pm-4pm. Weekend two-way flows peak at about 100 vehicles per hour around midday.

Detailed traffic survey data is presented in Appendix A.

Figure 3.3: TTPP Traffic Survey Locations (2023)

Figure 3.4: Surveyed Two-Way Traffic Flow Profile for Windellama Road at Project Site Access (September 2023)



3.3 Road Network Operation (2027)

The Project is proposed to generate peak construction traffic flows in 2027. To accommodate future traffic conditions on the surrounding road network a background growth rate of 2% per annum has been applied to all 2023 surveyed intersections.

The operation of the key intersections along the proposed transport routes for the Project for the 2027 future base case have been assessed using SIDRA INTERSECTION (SIDRA), a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the TfNSW, is vehicle delay. SIDRA determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 3.1 shows the criteria that SIDRA adopts in assessing the level of service.

Table 3.1: SIDRA Level of Service Criteria

Level of Service (LoS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode.
F	Greater than 70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode or major treatment

Reference: TfNSW Traffic Modelling Guidelines 2013, Table 14.4

Table 3.2 presents a summary of the future 2027 base case operation of key intersections along the Project's transport route. Full results presented in Appendix B of this report.

The SIDRA modelling results indicate that all intersections operate satisfactorily with good levels of service (i.e. LOS A – LoS D).

With the exception of the Sydney Road / Reynolds Street / Lagoon Street / Union Street intersection, all of the modelled intersections operate with minimal delays and significant intersection capacity (Los A). It is noted that the signalised intersection at Sydney Road / Reynolds Street / Lagoon Street / Union Street experiences a level of service LoS D on weekday afternoon peaks. This was observed to be associated with the general traffic and pick up traffic associated with the Goulburn North Public School and the St Joseph's Primary School.

Table 3.2: Future Base Case Intersection Operation (2027[1]) – No Gundary Solar Farm Development

Intersection		AM Peak Hour		PM Peak Hour		SAT Peak Hour	
ID	Name	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	Braidwood-Bungonia	7	A	7	A	7	A
2	Sloane-Braidwood	16	B	24	B	17	B
3	Bungonia-Forbes	9	A	10	A	9	A
4	Bungonia-Memorial	7	A	6	A	6	A
5	Hume-Garroorigang	6	A	7	A	6	A
6	Sydney Lagoon-Union-Reynolds	35	C	54	D	38	C
7	Sloane-Garroorigang	6	A	6	A	6	A
8	Windellama-Rifle Range	6	A	7	A	7	A
9	Windellama – Site Access	-	-	-	-	-	-

Notes: (1) 2027 Traffic flows based on 2023 TTPP Traffic Surveys + 2% pa traffic growth applied to all movements.

3.4 Road Safety

Historic crash data has been sourced from the TfNSW Centre for Road Safety for the five year period from January 2018 to December 2022 in the vicinity of the site and specifically the proposed Project site access at Windellama Road.

The crash locations in the vicinity of the Project site are shown in Figure 3.5.

The historic crash data shows that there have been 3 crashes between 2018 and 2022 near the Project site and specifically the Project site access, 2 of which were located on the transport route to and from the Project site for construction vehicles.

Each of the 3 crashes were single vehicle 'off road' crashes, 2 crashes at night and 1 crash during wet conditions. None of the crashes involved a fatality or a serious injury.

3.5 Public Transport Services

Public transport services are very limited within the immediate vicinity of the Project site. Goulburn railway station is located on Sloane Street on the southern edge of the main Goulburn commercial centre.

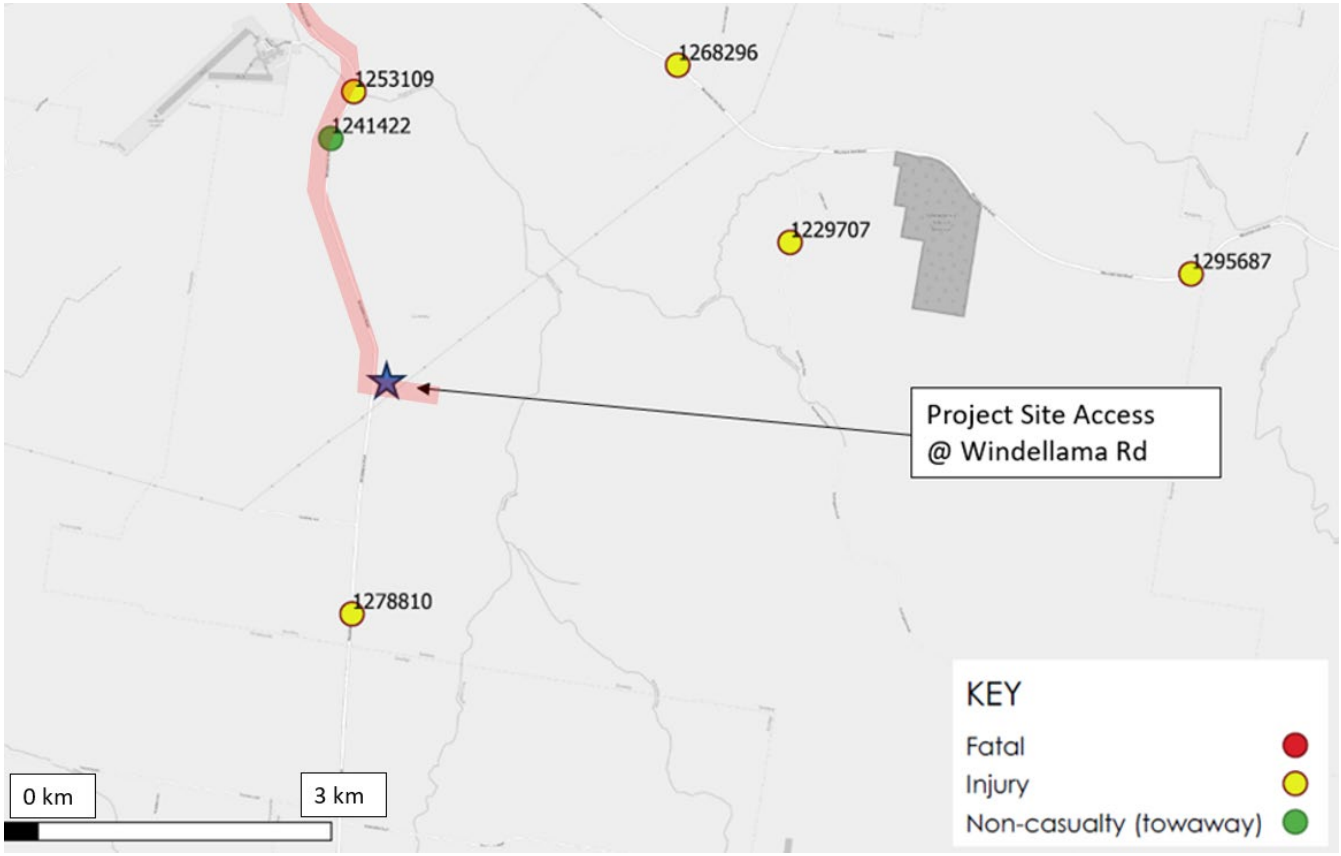
The train lines through Goulburn provide connections to Sydney, Canberra and Melbourne via the Main Southern Railway Line.

School bus services operated by Berrima Buslines and PBC Goulburn service the following schools within Goulburn:

- Goulburn North Public School
- Goulburn High School
- St Josephs Primary School
- St Peter and Pauls Primary School
- Goulburn West Public School
- Trinity College Campus
- Wollondilly Public School
- Mulwaree High School

Local bus services within the Goulburn township are provided by PBC Goulburn bus services. However, there are no designated public bus routes operating near the Project site.

Figure 3.5: Crash Locations along Transport Route (Windellama Road) - 2018-2022



Crash ID	Degree of crash	Year of crash	Month of crash	Day of week of crash	Two-hour intervals	Street of crash	Distance	Direction	School zone location	Type of location	Alignment	Road surface	Surface condition	Weather	Natural lighting	Other traffic control	Speed limit	Road classification (admin)	RUM - code	RUM - description	DCA - description	Key TU type	No. of traffic units involved	No. killed	No. seriously injured	No. moderately injured	No. minor-other injured
1241422	Non-casualty (towaway)	2020	September	Thursday	Unknown	WINDELLAMA	0	Right on the spot	No	2-way undivided	Curved	Sealed	Dry	Fine	Darkness	No traffic controls	100 km/h	Local	87	Off lft/lft bnd=>obj	Off left bend into obj	Light truck utility(from 2018)	1	0	0	0	0
1253109	Injury	2020	December	Sunday	00:01 - 01:59	WINDELLAMA	720	South	No	2-way undivided	Straight	Sealed	Dry	Overcast	Darkness	No traffic controls	100 km/h	Local	71	Off rd left => obj	Left off cway into object	Light truck utility(from 2018)	1	0	0	1	0
1278810	Injury	2021	November	Thursday	06:00 - 07:59	WINDELLAMA	2000	North	No	2-way undivided	Straight	Sealed	Wet	Raining	Daylight	No traffic controls	100 km/h	Local	73	Off rd rght => obj	Right off cway into obj	Light truck utility(from 2018)	1	0	0	1	0

3.6 Active Transport Infrastructure

Given the rural nature of the Project site and its surrounds, there are no formal pedestrian or cyclist facilities within the vicinity of the Project site.

4 Project Traffic Generation Assumptions

This section of the Amended TIA report sets out details of the assumptions used to estimate the potential traffic generation characteristics for the construction, operational and decommissioning stages of the Project.

In this report there is discussion and assessment of 'vehicle trips' generated by the proposed construction of the Project.

The RMS (now TfNSW) *Guide to Traffic Generating Developments* (2002) defines a trip as a vehicle movement from one point to another. A two-way trip is a trip in either direction between the two points. For clarity a vehicle delivering materials to the Project site and then departing the site is assessed as two vehicle trips or movements, one trip into and one trip out of the site.

4.1 Types of Project Related Traffic

For the purpose of the traffic assessment presented in this report, different types of traffic to be generated by the Project across the construction, operational and decommissioning stages of the Project are described as:

- General Construction Traffic (Non OSOM vehicles) for delivery of construction materials and contractor movements.
- Construction Traffic – OSOM vehicles
- Workforce vehicles (construction and operation)

General construction vehicles (non-OSOM) would include the following type of vehicles:

- Semi-trailers (19m) for the delivery of solar panels and associated components within shipping containers
- Heavy Rigid Vehicles (HRV 12.5m) or truck and dogs for delivery of building materials such gravel and building materials
- Agitators (concrete trucks)
- Vans and utilities.

OSOM vehicles will be used to transport battery and sub-station components to the Project site.

Details pertaining to the type of OSOM vehicle to be used for the Project are set out in the *OSOM Route Study* (ARES, 20/5/2025)[1]. OSOM to be used are expected to be up to 50 metres in length.

[1] *Gundary Solar Farm: OSOM Route Study*, prepared by ARES Group (20 May 2025)

An example of an OSOM vehicle with a transformer is shown in Figure 4.1.

Figure 4.1: Typical OSOM Vehicle Transporting Transformer (47.5m long)

Source: *Gundary Solar Farm: OSOM Route Study* ARES (20/05/2025)

Construction work force vehicles accessing the site will include a shuttle bus and passenger vehicles.

4.2 Construction Traffic Generation Assumptions

4.2.1 Daily General Construction Traffic Generation

Construction activities associated with the Project are expected to occur over a period of approximately 18 to 24 months with construction planned to commence in mid 2027.

Within this overall construction period, the level of construction activity will commence relatively low and build up to a 'peak' construction period of approximately 9 months occurring in the middle of the construction period. The level of activity will decrease towards the end of construction and commissioning.

The estimated daily two-way traffic generation of the Project during 'peak' construction is shown in Table 4.1.

Table 4.1: Project Peak Construction Daily Traffic Generation

Traffic Generation by Vehicle Type	Daily Trip Inbound (to site)	Daily Trip Outbound (from site)	Total Vehicle movements per Day (Total Two Way)	Comments
Construction Workforce				
Cars	0	0	0	Based on 250 workers. Assumes Employment Strategy with no Local employees Shuttle bus enters the site in AM and departs on PM (ie. shuttle buses stored on site during the working day)
Shuttle Buses	23	23	46	
General Construction Traffic				
Light Vehicles	130	130	260	
Single Unit Truck (MRV)	25	25	50	
Semi Trailer / Flat bed Truck (HRV)	30	30	60	
Total	**208**	**208**	**416**	

The volumes of construction traffic generation for the Project have been estimated based on Lightsource bp recently constructed solar farms.

The Project will operate a shuttle bus service for construction workers travelling to and from the site.

For the purpose of this traffic assessment, it is assumed that no workers will be sourced or stay within the immediate vicinity of the Project site and within the Goulburn Mulwaree LGA.

Workers outside of the Goulburn Mulwaree LGA will be transported via shuttle buses.

The arrival and departure of heavy vehicle movements to and from the Project site will be spread out over the course of the daily construction hours.

Light and shuttle bus vehicle movements to and from the site will be concentrated at the commencement and conclusion of work force shift times.

4.2.2 Peak Hour General Construction Traffic Generation

During the peak construction periods, the hourly traffic generation of the Project have been estimated as summarised in Table 4.2.

The estimated peak construction traffic flows in Table 4.2, Table 4.3 and Table 4.4 been used in the assessment of the operational impacts of construction traffic on the peak period conditions

for weekday and weekend (Saturday) on the surrounding road network (see Section 5.5). It is noted that Project working hours are not proposed to occur on Sundays in accordance with proposed construction hours.

Table 4.2: Project Peak Construction Hourly Traffic Generation – AM Peak (8-9am)

Traffic Generation by Vehicle Type	Hourly Trip Inbound (to site) vehicles / hour	Hourly Trip Outbound (from site) vehicles / hour	Total Hourly Trips (Total Two Way) vehicles / hour
Construction Workforce			
Cars	0	0	0
Shuttle Buses	23		23
General Construction Traffic			
Light Vehicles	13	13	26
Single Unit Truck (MRV)	3	3	6
Semi Trailer / Flat bed Truck (HRV)	3	3	6
Total	**42**	**19**	**61**

Table 4.3: Project Peak Construction Hourly Traffic Generation – PM Peak (3-4pm)

Traffic Generation by Vehicle Type	Hourly Trip Inbound (to site) vehicles / hour	Hourly Trip Outbound (from site) vehicles / hour	Total Hourly Trips (Total Two Way) vehicles / hour
Construction Workforce			
Cars	0	0	0
Shuttle Buses	0	23	23
General Construction Traffic			
Light Vehicles	13	13	26
Single Unit Truck (MRV)	3	3	6
Semi Trailer / Flat bed Truck (HRV)	3	3	6
Total	**19**	**42**	**61**

Table 4.4: Project Peak Construction Hourly Traffic Generation – Saturday Peak (12-1pm)

Traffic Generation by Vehicle Type	Hourly Trip Inbound (to site) vehicles / hour	Hourly Trip Outbound (from site) vehicles / hour	Total Hourly Trips (Total Two Way) vehicles / hour
Construction Workforce			
Cars	0	0	0
Shuttle Buses	0	23	23
General Construction Traffic			
Light Vehicles	13	13	26
Single Unit Truck (MRV)	3	3	6
Semi Trailer / Flat bed Truck (HRV)	3	3	6
Total	**19**	**41**	**61**

4.2.3 Over Size Over Mass (OSOM) Traffic Generation

With regard to OSOM vehicles, it is estimated that there will be a total of 10 x OSOM vehicle movements to and from the Project site over the entire construction of the Project (5 x OSOM loaded inbound + 5 x OSOM outbound empty vehicle trips).

OSOM movements to and from the site would be timed to occur outside of construction traffic peak hours and the surrounding road network generally.

4.2.4 Background Traffic on Surrounding Road Network

As detailed in Section 3.2 of this report, traffic surveys of the surrounding road network were undertaken in September 2023.

Construction traffic generated by the Project is expected to peak in 2027.

To accommodate the potential for background traffic growth between 2023 and 2027, a growth rate of 2% growth per annum has been applied to the surveyed 2023 traffic surveys.

The application of background growth thus represents a future 'base case' scenario upon which the operational implications of Project generated traffic can be assessed.

4.3 Project Operational Stage Traffic Generation

A permanent operations and maintenance (O&M) facility would be constructed on the Project site. Once the Project is operational the O&M facility will be utilised by the operational work force.

The operational phase is estimated to run for 40 years.

Once operational, it is estimated that the Project will generate up to 10 light vehicles (cars / utilities) two-way vehicle movements per day. There would also be an occasional heavy vehicle movement for waste collection or general maintenance and deliveries.

4.4 Project Decommissioning Stage Traffic Generation

Decommissioning of the Project will occur at the end of the lifespan of the Project, whenever that may occur.

Traffic generation during decommissioning of the Project will include vehicles associated with the removal of equipment from the Project site and Project site rehabilitation.

Decommissioning is expected to generate some 30% less traffic than the peak construction period.

5 Construction Traffic Impact Assessment

This section of the report presents the findings of the assessment of traffic related aspects of the construction stage of the project.

5.1 General Construction Vehicle Transport Routes

As detailed in Section 2.4.4 of this report, two feasible routes have been identified for the transport of construction materials between the arterial road network at Goulburn (ie. Hume Highway) and the Project site.

Solar panel materials will be transported to the Project site from either Port Botany or Port Kembla. Both of these ports will utilise the arterial road network to access the Hume Highway and Goulburn and hence approach the site from the north.

Similarly, construction materials sourced from local quarries, water supplies etc. are expected to approach the Project site from the Hume Highway.

A 19 metre long semi trailer is expected to be the largest general construction vehicle (ie. non-OSOM vehicle) to access the site.

As shown in Figure 2.3, both Option 1 and Option 2 are approved B-double routes between the Hume Highway and the Braidwood Road / Bungonia Road intersection. As such both transport haulage routes, (Option 1 and Option 2) are approved to carry 19 metre semi-trailer construction vehicles.

Notwithstanding the above, swept path analysis for a 19m long semi-trailer vehicle has been undertaken for key intersections along the haulage routes between the Hume Highway and the Project site access at Windellama Road.

The swept path analysis is presented in Appendix C.

The swept path analysis indicated that the existing road geometry between the Hume Highway and the Project site access at Windellama Road along both Option 1 and Option 2 construction vehicle haulage routes can adequately accommodate a 19 metre long semi trailer without the need for road network upgrades.

5.2 OSOM Vehicle Transport Routes

It is expected that a total of 10 x OSOM two-way vehicle trips (5 x OSOM loaded vehicles to site + 5 x OSOM empty from the site) would be undertaken during the construction stage of the project.

As detailed above, these OSOM vehicles would typically be associated with the transportation of battery and transformer components to the Project site.

OSOM vehicles' likely to be used will range in length up to 50m.

A detailed OSOM vehicle routes study[2] has been undertaken by ARES Group transport logistic experts.

Whilst Option 1 has been identified by Lightsource bp as the preferred OSOM route from the Hume Highway to the Project site, the ARES OSOM route study considered both Option 1 and Option 2 for the movement of OSOM vehicles.

The OSOM route study vehicle swept path assessment has determined that between the Hume Highway and the Project site access:

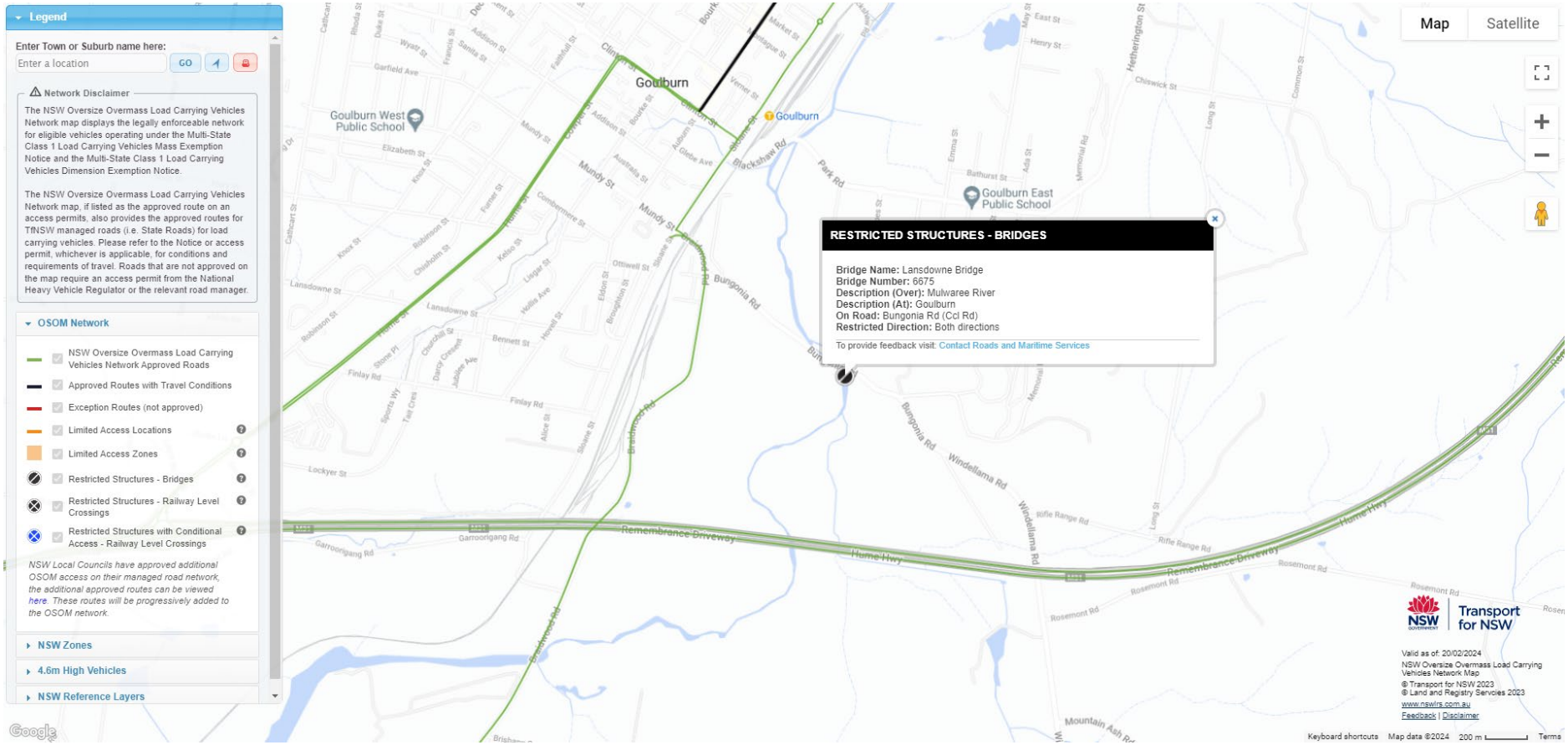
- The northern route (Option 1) can generally accommodate the geometric requirements of OSOM vehicles. However temporary traffic signal and street sign relocation will be required at the Sydney Road / Union Street intersection.
- The southern route (Option 2) can accommodate the geometric requirements of OSOM vehicles without adjustments to street furniture (ie. signs posts and kerb) between the Hume Highway and Bungonia Road. An additional area of hard stand would be required on Garroorigang Road on the approach to Sloane Street. As noted above, Option 2 is not the preferred OSOM route for the Project.
- Both options will require escort and traffic controllers to facilitate OSOM travel paths onto the opposite side of the road.
- A hard stand area will be required at the Windellama Road / Project site access intersection. The hard stand area would be additional to the intersection geometric requirements for general Project construction traffic (ie. Semi-trailer access).

OSOM vehicle loaded trips to the Project site across the entire construction period would be undertaken with appropriate traffic management measures, including pilot vehicle, warning signage and lights etc.

As shown in Figure 5.1, the OSOM mapping provided by TfNSW has identified the Lansdowne Bridge on Bungonia Road as a restricted structure. The Lansdowne Bridge is located on the transport route for construction vehicles associated with the Project.

[2] Gundary Solar Farm – OSOM Route Study prepared by ARES Group (28/10/2025)

Figure 5.1: Lansdowne Bridge – Restricted Structure



Consultation with TfNSW has confirmed that the Lansdowne Bridge was replaced in 2019 from a timber structure to a new concrete bridge. TfNSW also confirmed that GMC was now the relevant road authority for the new bridge.

Consultation with GMC confirmed that with regard to the load limit of the bridge:

- Lansdowne Bridge was designed to AS5100-2004 Bridge Design with a traffic loading of SM1600.
- The design traffic speed is 70km/h (although noted that its signposted as 60km/h).
- The bridge has been designed to a Heavy Load Platform Loading of HLP320.
- Provision for HLP320 Loading is restricted to one vehicle at any one time.
- HLP320 Loading may be permitted up to +/- 1m laterally in either direction from centre of carriageway.
- OSOM vehicle speed is restricted to 10km/h when crossing the bridge.

Thus, subject to a detailed vehicle loading analysis for OSOM and implementation of the measures highlighted by GMC, the upgraded bridge can accommodate OSOM vehicle associated with the project.

5.3 Recommended Preferred Construction Vehicle Route

Notwithstanding the above, consultation with TfNSW has highlighted a preference for Project construction traffic to utilise Option 2, namely the southern Hume Highway exit and Garroorigang Road and Sloane Street (south) to access Bungonia Road and onto Windellama Road.

The utilisation of the southern route (Option 2) by general construction traffic generated by the Project will avoid more sensitive land uses including schools and a higher number of residential properties. The southern route is generally more industrial and rural than the northern route.

It is recommended that the southern route (Option 2) is adopted as the primary route for general construction traffic associated with the Project.

However, it is noted that the northern route (Option 1) is geometrically feasible and may be appropriate for the movement of construction materials on an ad hoc / occasional basis.

Notwithstanding the above, no Project related construction traffic (heavy) shall utilise Option 1 during school zone hours of operation, namely 8-9.30am and 2.30 – 4pm on school days.

With regard to the 5 x OSOM vehicle movements to the Project site, Option 1 is the preferred route and will require temporary traffic signal and street sign relocation at the Sydney Road /

Union Street intersection and additional hardstand area at the Project site access at Windellama Road.

As detailed in the *OSOM Route Study* (ARES, 20/05/2025) transport permits will need to be obtained from the National Heavy Vehicle Regulator prior to travel. This will require consultation with TfNSW and GMC and will include details pertaining to the proposed routes and associated works.

5.4 Project Site Access – Windellama Road

5.4.1 Proposed Site Access Improvement Works – Concept Layout

As described in Section 2, constructed related traffic will enter and exit the Project site via the Windellama Road site access.

It is understood that proposed Project site access works at Windellama Road would be undertaken in the early stages of construction such that the improved access arrangements will be in place to accommodate construction vehicles, particularly the transportation of solar panel equipment and other materials by heavy vehicles.

It is proposed that all heavy construction vehicles will approach the Project site from the north, thereby undertaking a left turn into the Project site from Windellama Road to connect to the internal Project site road network.

Similarly, heavy construction vehicles exiting the Project site will turn right at Windellama Road and head back towards Goulburn.

It is proposed that pavement widening be provided at the Project site access to accommodate a BAL left turn treatment along the Windellama Road approach. Additionally additional pavement is proposed to accommodate appropriate turn radius for a Basic rural intersection.

Furthermore, the OSOM Route Study (ARES 28/10/2025) has identified hard stand requirements for the movement of laden OSOM vehicles into the site.

The concept design for the Project site access is shown in Figure 5.2 and Appendix E.

As shown in Figure 5.3 and Figure 5.4, the concept layout with additional pavement can adequately accommodate the turning movements (swept paths) of a 19m semi-trailer which is largest general construction vehicle expected to access the Project site during construction.

Figure 5.2: Project Site Access Improvements - Concept Layout

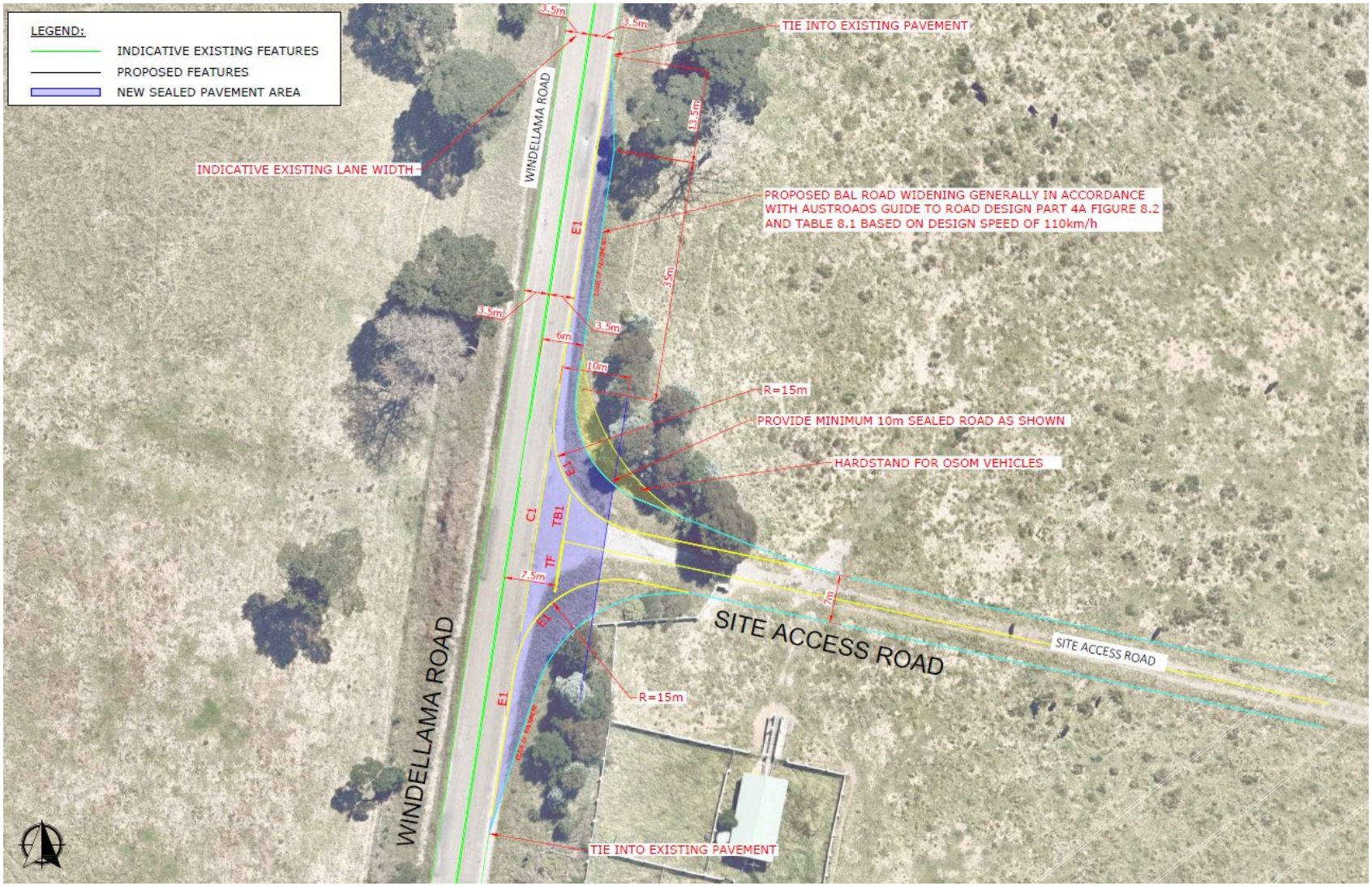


Figure 5.3: 19m Semi Trailer Swept Path (Entry) – Project Site Access at Windellama Road

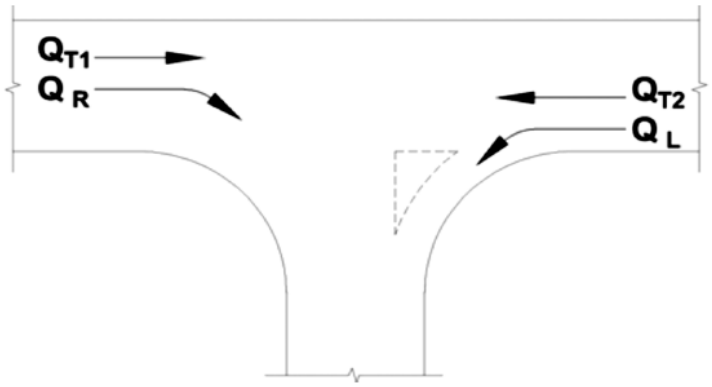
Figure 5.4: 19m Semi Trailer Swept Path (Exit) – Project Site Access at Windellama Road

5.4.2 Project Site Access Intersection Design – Turn Warrants

An assessment of the turn treatments required for the proposed Project site access point at Windellama road has been undertaken in accordance with *Austroads Guide to Road Design (AGRD) Part 4* (2017 and 2021) and *Austroads Guide to Traffic Management (AGTM) Part 6 (2020)*.

The turn treatment warrants are based on the major road traffic volumes on Windellama Road 'QM', and the volume of turning movements generated by the construction activities, 'QR' and 'QL'. The value for QR and QL have been taken from peak period construction traffic generation as estimated above in this report.

Figure 5.5: Calculation of the Major Road Traffic Volume Parameter, QM



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	$= Q_{T1} + Q_{T2} + Q_L$
		Yes	$= Q_{T1} + Q_{T2}$
	Left	Yes or no	$= Q_{T2}$

Source: Austroads Guide to Traffic Management Part 6, 2020

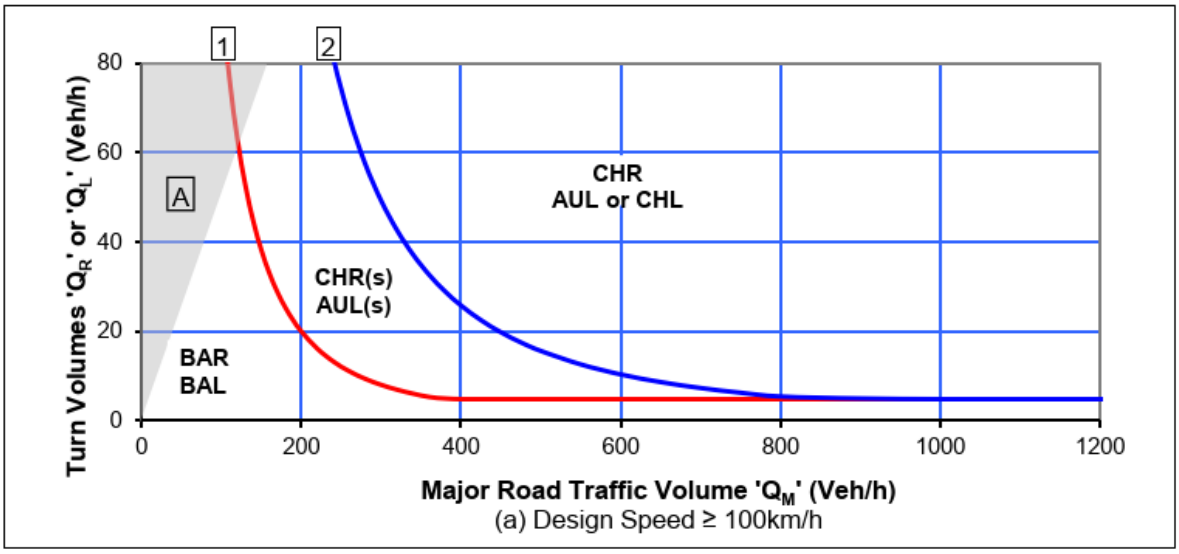
Table 5.1: Calculation of QM

Road Type	Peak Period	Turn Type	Splitter Island	Q_M (vph) (2027)	
Site Access at Windellama Road					
Two-Lane Two-Way	AM	Left (Q_L) = 42	No	$Q_M = Q_{T2}$	48 vph
	PM	Left (Q_L) = 19	No	$Q_M = Q_{T2}$	122 vph

The turn treatment warrant assessment also considers the design speed of the road, which is typically taken as the posted speed limit plus 10 km/h; namely, the design speed for Windellama Road is 110 km/h.

Figure 5.6 shows an extract from AGTM Part 6 of the turn treatment warrants on major roads at unsignalised intersections with a design speed more than 100 km/h, which is applicable to Windellama Road.

Figure 5.6: Warrants for Turn Treatments on Major Roads at Unsignalised Intersections



Source: Austroads Guide to Traffic Management Part 6, 2020

Based on values for Q_M, Q_L and Q_R in Table 5.1 and warrants for turn treatments in Figure 5.6, the turn treatments required at a Project site access at Windellama Road would be as follows:

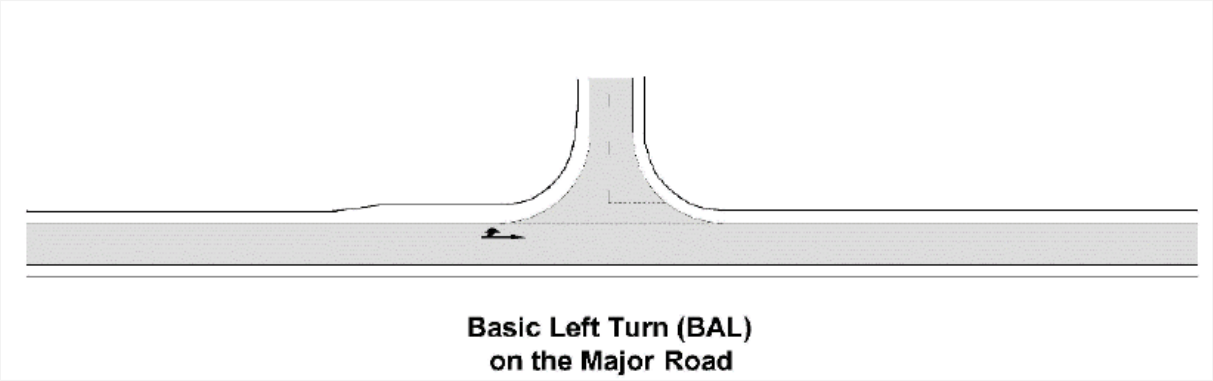
- a basic left-turn (BAL).

An indicative layout for BAL treatments as per AGRD Part 4 is provided in Figure 5.7.

It is noted that as construction vehicles shall approach from and depart to the north, construction vehicles (heavy) will not turn right into the site and thus BAR treatments are not required.

The proposed concept layout plan for the Windellama Road site access (Figure 5.2) satisfies these Austroad intersection requirements.

Figure 5.7: Basic Left Turn (BAL)



Source: Austroads Guide to Traffic Management Part 6, 2020

5.4.3 Project Site Access Intersection Capacity

To assess the capacity of a Project site access intersection at Windellama Road during peak construction periods a SIDRA intersection analysis was undertaken.

The intersection capacity modelling results are shown in Table 5.2.

Table 5.2: Project Site Access Intersection Operation (2027) with Project Construction Traffic

Intersection	Period	2027 Base + Construction Traffic	
		Ave. Delay (sec)	LoS
Windellama Road / Project Access Intersection	Weekday Morning Peak	7	A
	Weekday Afternoon Peak	8	A
	Saturday Midday Peak	8	A

The modelling shows that a Project site access intersection would perform acceptably with the construction traffic generated by the Project.

It is noted that there are other potential and proposed developments within the vicinity of the Project site. Should the construction activities overlap then there is potential for additional traffic flows within the road network.

Further details regarding potential cumulative implications to the road network are detailed in Section 5.9.

5.4.4 Sight Distance Assessment

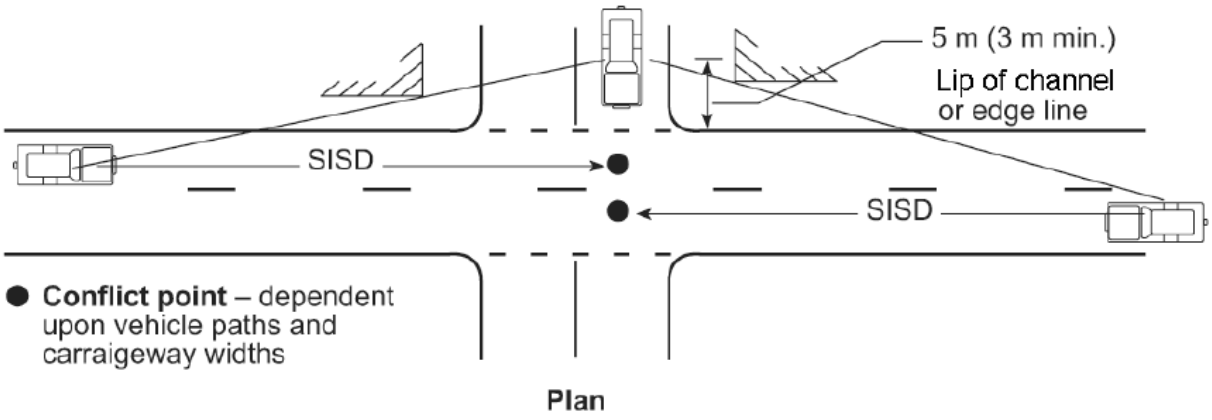
The provision of adequate distances for vehicles entering or exiting a road from another road or driveway is a key feature in the provision of safe intersection.

A review of driver sight distance at the Project site access has been undertaken in accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersection (2021) for the proposed Project site access at Windellama Road.

In assessing the available sight distances at the proposed Project site access the Safe Intersection Sight Distance (SISD) criteria as defined by Austroads has been applied.

SISD is the minimum sight distance which should be provided on the major road at any intersection. The method of calculating SISD is shown graphically in Figure 5.8

Figure 5.8: Safe Intersection Sight Distance (SISD)



Source: Austroads (2021) Guide to Road Design Part 4A: Unsignalised and Signalised Intersection

As shown in the extract from Austroads guide (see Figure 5.9), the SISD requirement increases with increasing design speed of the major road.

For the Windellama Road Project site access the design speed of 110km/h has been applied. This represents the posted speed limit (100km/h) + 10 km/h.

Based on Figure 5.9, the SISD requirement is 285 m.

The available sight distances at both of these locations exceeds 300 metres and thus complies with Austroad SISD requirements.

Thus, the proposed Project site access driveways will be located and constructed such that there is adequate entering sight distance to traffic along the frontage road.

Figure 5.9: Available Driver Sight Distances at Windellama Road Project site Access

Design speed (km/h)	Based on safe intersection sight distance for cars[1] h_1 = 1.1; h_2 = 1.25, d = 0.36[2]; Observation time = 3 sec					
	R_T = 1.5 sec[3]		R_T = 2.0 sec		R_T = 2.5 sec	
	SISD (m)	K	SISD (m)	K	SISD (m)	K
40	67	4.9	73	6	–	–
50	90	8.6	97	10	–	–
60	114	14	123	16	–	–
70	141	22	151	25	–	–
80	170	31	181	35	–	–
90	201	43	214	49	226	55
100	234	59	248	66	262	74
110	–	–	285	87	300	97
120	–	–	324	112	341	124
130	–	–	365	143	383	157

5.5 Road Network Capacity

As detailed in Section 3.3, TTPP undertook an assessment of road network operation at key intersections along the proposed construction traffic routes namely the southern and northern Hume Hwy exits at Goulburn based on 2023 traffic surveys.

As requested by TfNSW, a background factor has been applied to 2023 surveyed traffic flows to create a Base 2027 scenario. The road network operation for the Base 2027 scenario has been assessed using the SIDRA intersection modelling software.

The estimated peak period construction traffic generation of the Project has been added to the 2027 Base traffic flows at the key intersections to represent the road network operation 'with development' scenario. These 'Base 2027 + Development' traffic flows were analysed using SIDRA and the results compared to the Base 2027 scenario to determine the level of impact associated with the Project construction.

The "with Gundary Solar Farm project construction traffic" results of the SIDRA modelling are summarised in Table 5.3 and Table 5.4. Detailed results presented in Appendix B.

The results indicate that the addition of construction traffic related to the Project will not adversely impact on the operation or Level of Service at any of the key intersections along both the northern (Option 1) and southern (Option 2) Project construction transport routes.

In summary the road network can satisfactorily accommodate the peak construction period of the proposed Project.

Table 5.3: Intersection Operation - Base (2027) + Project Construction Traffic Route Option 1 (Northern Access via Sydney Road)

	Intersection		AM Peak Hour		PM Peak Hour		SAT Peak Hour	
	ID	Name	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Existing + Dev to/from Sydney Rd	1	Braidwood-Bungonia	7	A	8	A	7	A
	2	Sloane-Braidwood	18	B	31	C	20	B
	3	Bungonia-Forbes	9	A	10	A	9	A
	4	Bungonia-Memorial	7	A	7	A	6	A
	5	Hume-Garoorigang	6	A	7	A	6	A
	6	Lagoon-Union	35	C	54	D	37	C
	7	Sloane-Garoorigang	6	A	6	A	6	A
	8	Windellama-Rifle Range	7	A	7	A	7	A
	9	Windellama-Site Access	7	A	8	A	8	A

Table 5.4: Intersection Operation - Base (2027) + Project Construction Traffic Route Option 2 (Southern Access via Hume Street)

	Intersection		AM Peak Hour		PM Peak Hour		SAT Peak Hour	
	ID	Name	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Existing + Dev to/from Hume St	1	Braidwood-Bungonia	7	A	8	A	7	A
	2	Sloane-Braidwood	18	B	44	D	23	B
	3	Bungonia-Forbes	9	A	10	A	9	A
	4	Bungonia-Memorial	7	A	7	A	6	A
	5	Hume-Garoorigang	6	A	7	A	6	A
	6	Lagoon-Union	35	C	53	D	37	C
	7	Sloane-Garoorigang	6	A	6	A	6	A
	8	Windellama-Rifle Range	7	A	7	A	7	A
	9	Windellama-Site Access	7	A	8	A	8	A

5.6 Road Safety

As documented above, the proposed Project site access arrangements at Windellama Road meet with the design requirements and safe intersection sight distances as defined by Austroads.

This will provide a safe environment for the entry and exit of vehicles to and from the Project site.

The analysis of historical crashes within the vicinity of the Project site indicated that the rate of crashes along Windellama Road is relatively low and that there were no systemic crash locations or accident types that would indicate a particular safety issue that would be adversely impacted with additional construction traffic associated with the Project.

As detailed above, the selection of the southern Goulburn exit from the Hume Highway as the primary construction vehicle route (ie. Option 2) will avoid potential conflicts with sensitive land uses, such as the Goulburn North Primary School and St Joseph Primary School.

5.7 Internal Roads and Car Parking Arrangements

Suitable on-site manoeuvring areas would be available so that larger vehicles are able to safely manoeuvre into the Project site off the public road network, around the Project site and exit the Project site onto the public road network.

All vehicles would enter and exit the Project site to / from the public road network in a forward direction only.

All vehicles generated by construction staff would be accommodated within on-site parking areas.

The construction and maintenance of the solar farm will require the construction of an internal site access network to reach all the solar panel and BESS locations as well as other infrastructure.

The internal site access network will consist of private access tracks and will not be accessible to the public, ie. access will be controlled by lockable gates.

The internal site access network will generally be a minimum 3.5m – 4.0m wide with regular passing bays and turning heads as required to accommodate construction vehicles. These areas would also provide turning / manoeuvring and passing opportunities for delivery vehicles.

The internal accesses will comprise an all-weather graded surface. Ongoing operational maintenance of on-site accesses would be undertaken by the solar farm operator.

5.8 Public Transport, Pedestrians and Cyclists

Given the proposed weekday construction hours are from 7am to 6pm, the construction workforce trips would typically occur before 7am and after 6pm, which would generally not coincide with school bus services. Heavy vehicles would arrive and depart throughout the day. Any potential interaction with school bus operations and stops would be considered in the Construction Traffic Management Plan (CTMP) to minimise any delays, disruptions, and safety risks.

Regarding pedestrians and cyclists, the rural nature of the Project Area implies that most pedestrian and cycling activity occur within Goulburn town where there are footpaths provided. Given that the proposed construction working hours are from 7am to 6pm, the workforce vehicle trips would be outside the normal peak period for walking and cycling activity in Goulburn. The distances between towns and other major centres in the area discourages casual cycling outside of the town areas.

It is considered that with the management and mitigation measures proposed (refer to Section 6), the Project will have negligible impact in terms of pedestrian and cyclist safety.

5.9 Cumulative Traffic Assessment

An analysis of potential major projects and local development applications within the region surrounding the Project site has been undertaken by Umwelt in the preparation of the EIS documentation.

There is a number of proposed renewable energy projects in the region that will also utilise the Hume Highway for the transportation of construction materials to relevant project sites. However, the Hume Highway is considered to have sufficient capacity to accommodate significant increases in traffic flows.

With regard to impacts of the proposed Gundary Project transport routes, the Merino Solar Farm proposal will potentially utilise the same transport routes, thereby increasing the volume of traffic on the route if construction occurs concurrently. On the advice of TfNSW, the potential traffic associated with the construction of the Merino Solar Farm has not been included in the assessment present in this Amended TIA.

The SIDRA analysis for the Gundary Solar Farm project did highlight a noticeable change to the level of service at the Sloane Street / Braidwood Road intersection where project traffic utilises the northern route (Option 1).

This suggests that should both the Gundary and potentially other projects undertake peak construction at the same time, then the southern transport route (Option 2) shall be the preferred route to reduce potential congestion at the Braidwood Road / Sloane Street intersection.

5.10 Operational Stage Traffic Assessment

The operational phase of the Project includes the general operation of the solar farm, with monitoring both by on-site staffing and via remote monitoring.

Aspects of the Project operation to be dealt with by on-site staff would include safety management, environmental condition monitoring, landowner management, routine servicing, malfunction rectification and site inspections.

Those functions to be overseen by remote monitoring include solar panel and BESS performance assessment, solar farm reporting, remote resetting and maintenance co-ordination.

Maintenance staff will be on-site throughout the year, making routine checks of the solar farm infrastructure on an ongoing basis. Major planned servicing would be carried out intermittently and involve up to 10 light vehicles two-way trips by staff with the occasional heavy vehicle for maintenance / deliveries.

This level of traffic generation would readily be absorbed into the spare capacity of the existing road network.

It is noted that operational traffic would continue to utilise the upgraded Project site access at Windellama Road.

5.11 Emergency Vehicle Access Arrangements

The proposed Project site access at Windellama Road and the existing Project site access at Kooringaroo Road will provide the Project site with alternate emergency vehicle access during construction and during operation. In addition, the perimeter fencing will have up to 10 emergency gate accesses for emergencies.

The provision of these two emergency vehicle accesses for the Project site will also facilitate general community access across the Project site in an emergency situation. That is the internal road connections between the two site accesses will facilitate an alternative evacuation path for site personnel and the general community in the case of a bush fire and disconnection of the Kooringaroo Road connection to Mountain Ash Road and beyond.

At the northern end of Kooringaroo Road, Kooringaroo Road is sealed road with a sealed width of approximately 6 metres and unsealed shoulders.

The southern end of Kooingaroo Road near the Project site's emergency access is narrower (approximately 4m wide) with additional shoulders and of gravel construction.

The available width of 4m wide lanes plus shoulders is satisfactory for the travel path of an emergency vehicle (including fire fighting vehicles). The available road shoulders will allow vehicles to pass an emergency vehicle travelling in the opposite direction.

5.12 Decommissioning Stage Traffic Assessment

At the end of the Project's operational life, the Project will be decommissioned with Project infrastructure dismantled and removed for the Project site.

Traffic generation during decommissioning is estimated to be approximately 30% less than the peak traffic generation during construction.

Based on the assessment of the road capacity during the construction phase, it is envisaged that road network impacts would be minimal.

Notwithstanding the above, it is considered appropriate that a comprehensive Construction Traffic Management Plan (CTMP) would be prepared prior to the decommissioning phase in conjunction with the relevant road authorities. This would aim to ensure adequate road safety and road network operations are maintained during decommissioning of the Project site.

5.13 Reflection

Two road receivers (namely Windellama Road and Kooringaroo Road) and one rail receiver were assessed for glint and glare impacts through a Glint and Glare Impact Assessment (Moir, 2024) completed for the Project.

Kooringaroo Road has been assessed as having potential to experience 'Yellow' glare that exceeds the acceptable threshold of 10 hours per year. This glare occurrence is expected during the period from mid-October to March, specifically between 5:50 pm and 7:00 pm.

Vegetation screening is proposed along the northeastern boundary of the Project Area, near Kooringaroo Road, which will mitigate the potential glare impact.

5.14 Flooding

Flood modelling completed for the Project (WRM, 2024) show that the location of the Project access from Windellama Road is suitable in terms of flooding constraints. No flooding is predicted at the Project access point under all flood events.

6 Project Impact Mitigation Measures

The following sets out suggested mitigation measures to manage and / or mitigate the potential traffic and transport related impacts associated with the proposed Gundary Solar Farm project.

6.1 OSOM Enabling Works

Oversized and over mass (OSOM) vehicles would be governed by a detailed traffic management plan that should be developed before approval for transport is granted.

The traffic management plan will include:

- Procedures for escorts of oversized and over mass vehicles.
- Traffic control plans for temporary road closures (if necessary) to allow vehicles to cross to carriageway. Specific plans will be required for OSOM access across the Lansdowne Bridge on Bungonia Road.
- Safe work methods and strategies for working on roadways.
- Location and use of rest stops and layovers along the journey.
- Communication strategy to affected communities.
- Notification and consultation of key stakeholders including:
  - Police and emergency services
  - Local Councils along the route
  - Public and School bus operators that may be affected
  - Advertising in local newspaper and media releases.
- Contact details of foreman or project manager throughout operations to be shared with emergency services and road authorities.
- Timing of operations and measures to avoid commuter peaks and school peaks through populated areas where practicable.
- Consideration of cumulative impacts of other projects along the route.
- Identification of layby areas for driver breaks and co-ordination of OSOM on site arrivals.

6.2 Reducing Project Related Traffic Generation

To reduce the potential number of light vehicles generated by the Project, it is recommended that the use of shuttle bus services to and from key worker accommodation sites is implemented in a manner consistent with the percentages set out in this report.

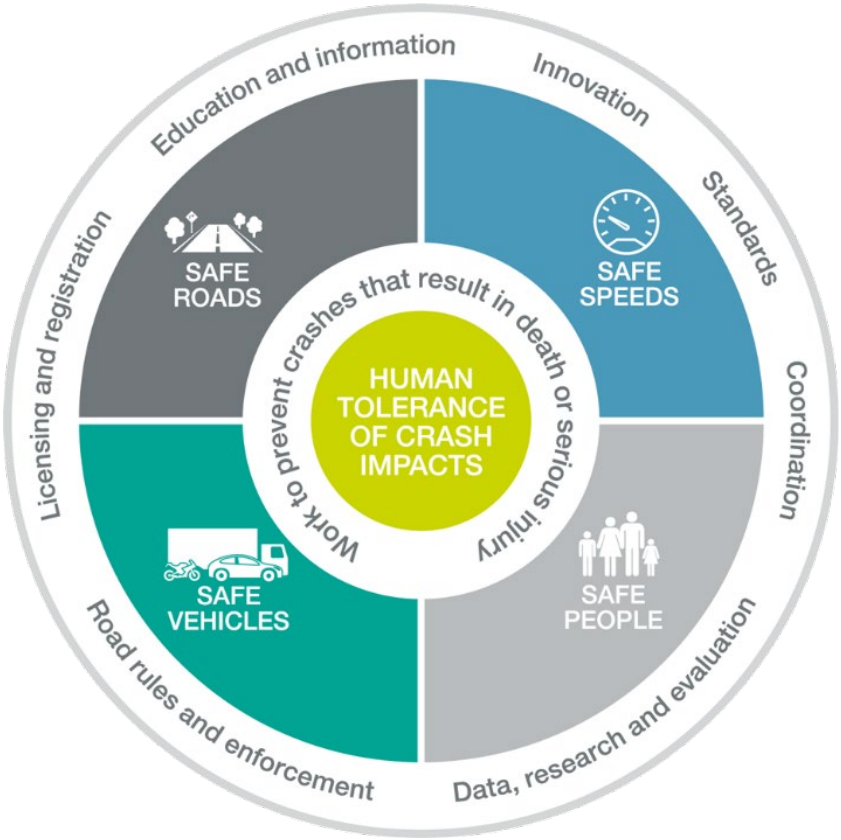
The adoption of shuttle bus transport would significantly reduce the potential volume of light vehicles and reduce the impact on the road network and improve the safety for workers and the community through driver fatigue management.

The assessment presented in this report has assumed the use of 12-seater minibuses though higher capacity vehicles should be considered if feasible to reduce the amount of traffic.

6.3 Road Safety

Under the safe systems approach road safety is generally improved by focussing on Safe Roads, Safe Speeds, Safe People and Safe Vehicles. The safe systems approach is summarised in Figure 6.1.

Figure 6.1: Safe Systems Approach



Source: National Road Safety Strategy

6.3.1 Safe People

"Safe people" can be achieved by education of workers and policies of the work site. To this end worker site induction should include driver education of the local road conditions and an adoption of a "drivers code of conduct".

This could include:

- Training on drivers respect private property and farm gates.
- Driving to the conditions on unsealed roads.
- Avoid speeding and other dangerous behaviour. Identification and communication of known road crash cluster locations. Also, identification and warning of when roads may be affected by black ice, road damage (pot-holes) and incidents.
- A drug and alcohol policy to reduce incidents of drunk and drug driving.
- Additional caution when driving at dawn and dusk of kangaroos and other wildlife.
- Driving around livestock.
- Measures to reduce the risk of workers driving while tired.

In addition, the use of shuttle bus services would reduce the number of workers driving from the Project site while tired.

6.3.2 Safe Vehicles

Contractors are to ensure that all vehicles used are road worthy and in good working condition with lights, brakes, tire pressure etc.

6.3.3 Safe Speeds

As part of managing the Project, workers would be required to drive to the conditions and respect speed limits.

6.3.4 Sensitive Land Uses

It is recognised that the Project may have an impact on sensitive land uses such as schools and residential precincts within townships along material delivery routes.

To minimise the impacts on schools it is recommended that temporary road closures for OSOM vehicle movements should be avoided during school peaks. To this end vehicle layovers should be identified so allow vehicles to wait until appropriate times for travel.

6.4 Dilapidation Survey

Dilapidation surveys covering the pavement, drainage, and bridge structures will be undertaken in consultation with TfNSW and local Councils for the proposed transport routes before and after construction. Regular inspections and consultation with local Councils and proponents would be developed. It is expected that any damage resulting from construction traffic, except normal wear and tear, would be repaired.

6.5 Road Authority Approvals for OSOM Vehicles

OSOM vehicles would require permits from the National Heavy Vehicle Regulator (NHVR). This replaces the approvals that were previously granted from TfNSW and councils. Applications are to be submitted to the NHVR.

7 Conclusions

The Gundary Solar Farm project will involve the construction and operation of a 400 MWp solar farm and battery storage system on the Project site located approximately 10km south-east of Goulburn in the Southern Highlands of NSW.

With regards to traffic and transport the construction of the Project will include:

- Construction duration of between 18 – 24 months with peak construction activity of approximately 9 months in the middle of the works
- Up to 250 personnel on site during peak construction activities
- Up to 416 two-way construction vehicle trips per day in peak construction
    - 260 light vehicle trips
    - 46 shuttle bus trips
    - 110 heavy vehicle trips
- Daily heavy vehicle trips will generally involve a range of vehicle sizes up to and including a 19m semi-trailer
- A total of 10 OSOM two-way vehicle trips are anticipated over the duration of the construction period and are associated with the delivery of battery components. The maximum length of the OSOM vehicles are expected to be a 30-50m long vehicles.

The proposed transport routes will utilise the Hume Highway to access the Project site from the selected port location (Port Botany or Port Kembla).

Two options have been identified for the transport of Project material between the Hume Highway and the Project site. The routes utilise the northern (Option 1) or the southern (Option 2) exit from the Hume Highway at Goulburn.

The two options for transport of materials to the Project site are described to be:

- Option 1: Hume Highway - Sydney Road – Reyolds Street – Grafton Street - Sloane Street – Braidwood Road - Bungonia Road - Windellama Road
- Option 2: Hume Highway - Hume Street - Garroorigang Road – Sloane Street - Braidwood Road – Bungonia Road - Windellama Road.

The geometric assessment of the transport route alternatives has demonstrated that both routes can satisfactorily accommodate the swept path movements of the proposed construction vehicle types (up to 19 meters long) without the need to adjust road infrastructure or intersection layouts with the exception of the Braidwood Road / Bungonia Road intersection.

Temporary modifications to street furniture (kerbs / signage etc) within the Goulburn road network are unlikely to be required to accommodate the 5 loaded OSOM vehicle deliveries of

battery and substation components to the Project site as detailed in the *Gundary Solar Farm - OSOM Route Study* prepared by ARES Group (28/10/2025).

Option 1 is designated as an approved OSOM route between the Hume Highway and Braidwood Road.

Notwithstanding the above, Option 2 has been identified by GMC as the preferred route as it passes through mainly rural / industrial land uses.

Option 2 is thus recommended as the primary transport for the Project. Option 1 will be an alternative route for ad hoc and potentially OSOM vehicles.

The assessment of the road network operation demonstrated that the road network on both the potential proposed transport routes (Option 1 and Option 2) have sufficient capacity to accommodate the peak construction traffic generation of the Gundary Solar Farm project.

To accommodate the proposed Gundary Solar Farm project the following measures are recommended:

- Project site access intersection improvement works at the Windellama Road site access point to accommodate turning movements to and from the Project site.
- Utilisation of the southern transport route (Option 2) as the primary transport route. Construction vehicles not to utilise the northern route (Option 1) during School Zone times.
- Implementation of appropriate traffic control measures and plans for OSOM vehicle movements (5 inbound loaded + 5 outbound unloaded). This shall include the movement of OSOM vehicle over the Lansdowne Bridge on Bungonia Road.
- Implementation of the Drivers Code of Conduct detailing expectations for driver behaviour for travel to and from the Project site.
- Preparation and implementation of a detailed Construction Traffic Management Plan (CTMP) detailing how works to the Project site access and ongoing construction works will be undertaken. The CTMP shall be prepared by the proponent with the works contractor in consultation with Council.

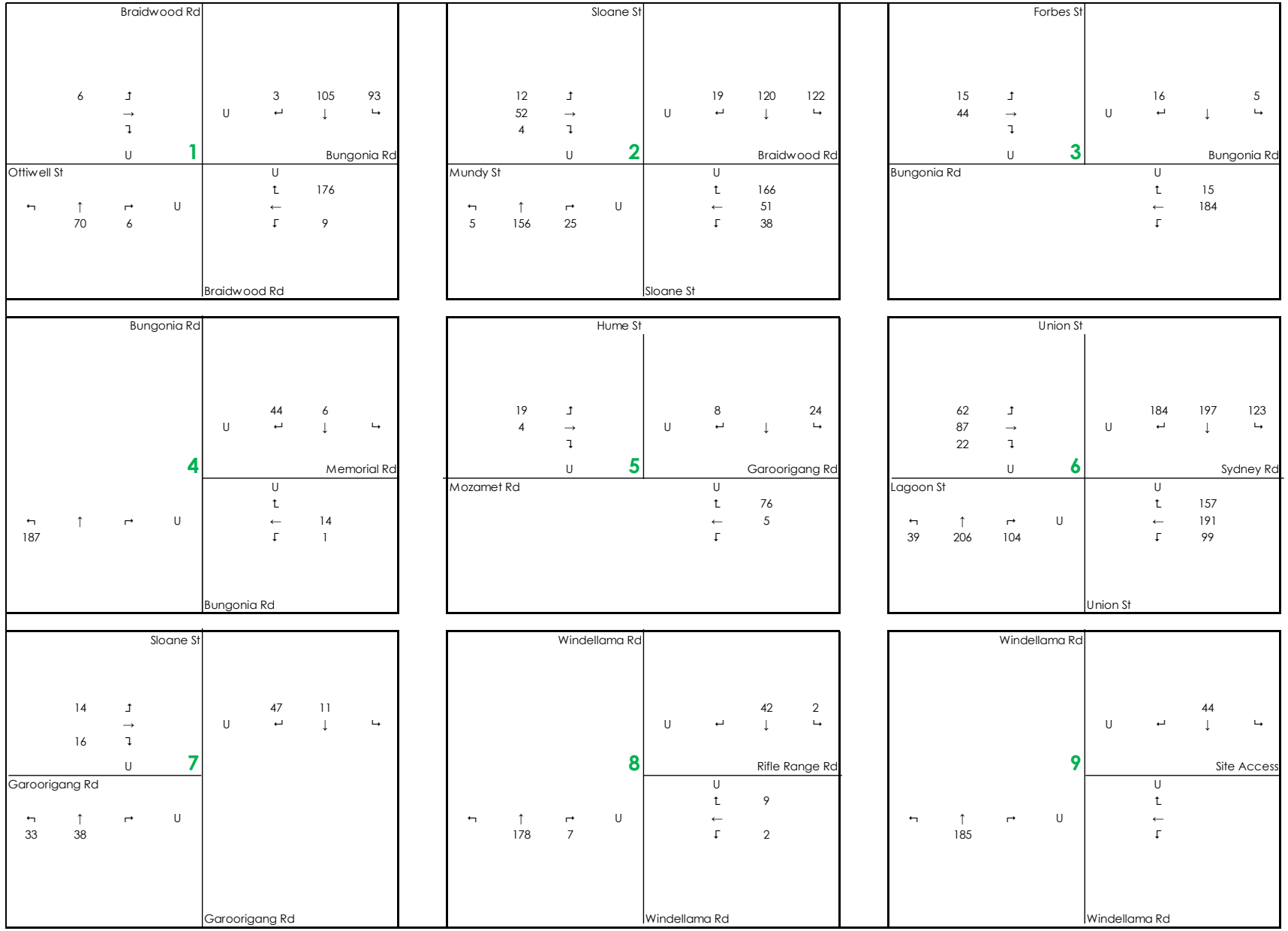
In conclusion, it is considered that with the mitigation measures set out in this report, that the construction, operation and decommissioning of the Gundary Solar Farm can be undertaken without significant adverse impacts to the operation, capacity or safety of the surrounding road network.

Appendix A

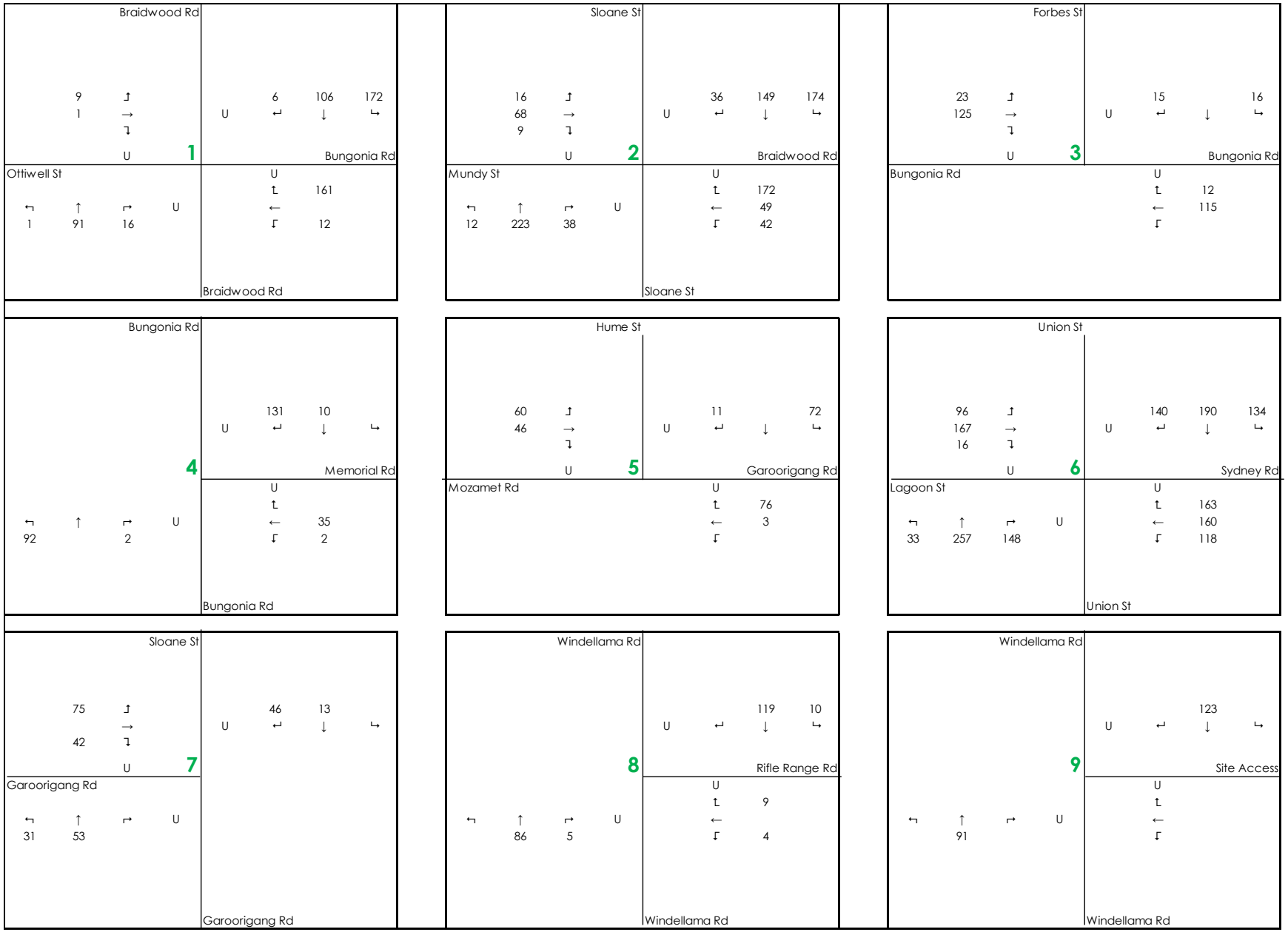
Traffic Surveys

2023 – Traffic Survey Locations

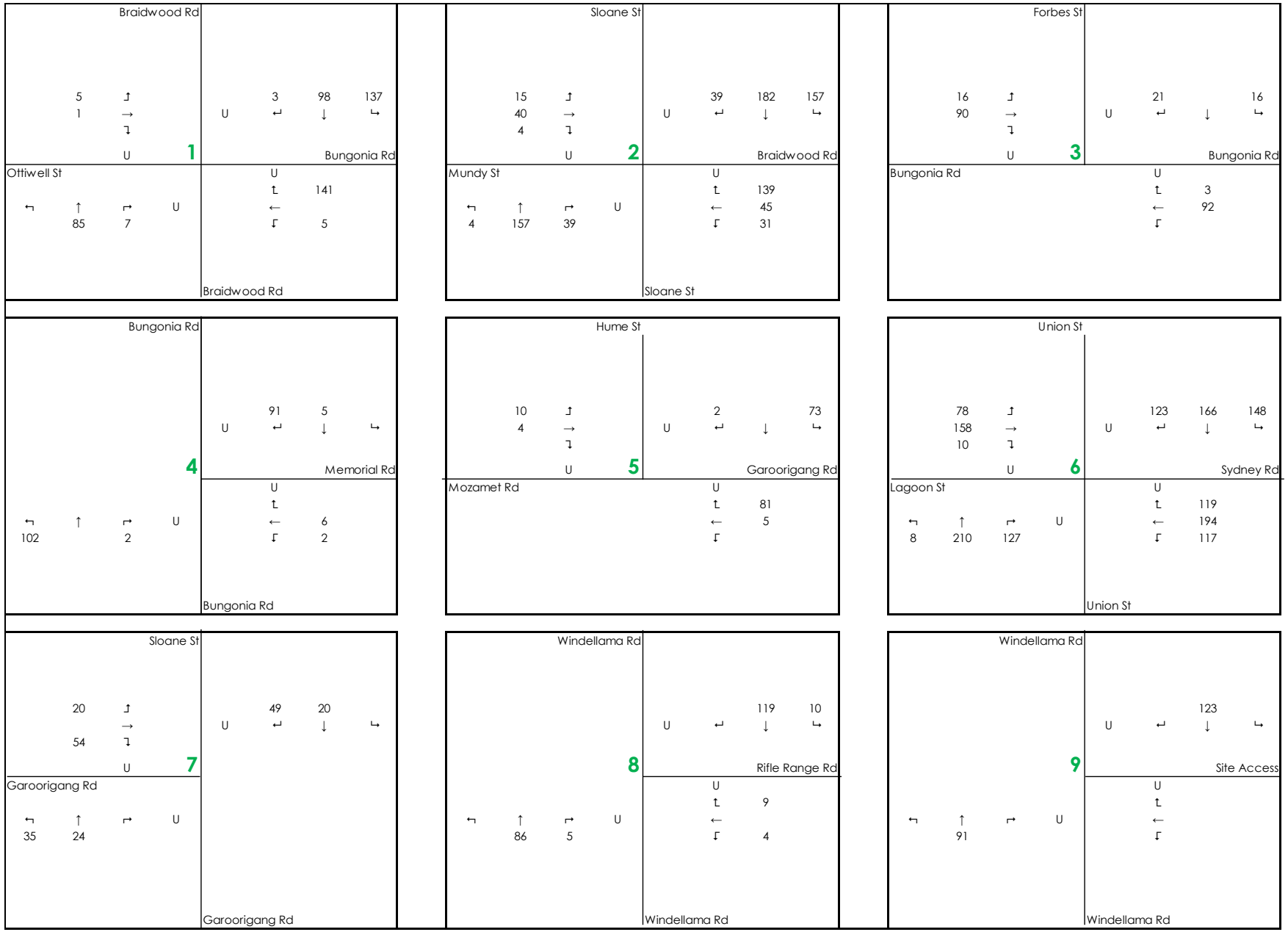
2023 – Weekday AM Peak Hour – Total Traffic distributions (vehicles / hour)



2023 – Weekday PM Peak Hour – Total Traffic distributions (vehicles / hour)



2023 – Saturday Peak Hour – Total Traffic distributions (vehicles / hour)



Appendix B

SIDRA Intersection Analysis Results

USER REPORT FOR SITE

Project: 23042-260218

Output produced by SIDRA INTERSECTION Version: 9.1.6.228 **Template: Movement Summary**

Site: 1 [1. AM_Braidwood-Bungonia (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.051	6.0	LOS A	0.0	0.4	0.04	0.07	0.04	25.3
2	T1	All MCs	79	20.0	79	20.0	0.051	0.0	LOS A	0.0	0.4	0.04	0.07	0.04	58.2
3	R2	All MCs	6	16.7	6	16.7	0.051	6.1	LOS A	0.0	0.4	0.04	0.07	0.04	44.9
Approach			86	19.5	86	19.5	0.051	0.6	NA	0.0	0.4	0.04	0.07	0.04	57.0
East: Bungonia Rd															
4	L2	All MCs	11	10.0	11	10.0	0.008	4.5	LOS A	0.0	0.2	0.22	0.51	0.22	34.5
5	T1	All MCs	1	0.0	1	0.0	0.250	4.2	LOS A	1.0	7.0	0.41	0.66	0.41	33.1
6	R2	All MCs	200	5.8	200	5.8	0.250	5.9	LOS A	1.0	7.0	0.41	0.66	0.41	39.5
Approach			212	6.0	212	6.0	0.250	5.9	LOS A	1.0	7.0	0.40	0.65	0.40	39.3
North: Braidwood Rd															
7	L2	All MCs	106	7.9	106	7.9	0.137	5.7	LOS A	0.5	4.2	0.04	0.26	0.04	37.4
8	T1	All MCs	119	13.3	119	13.3	0.137	0.0	LOS A	0.5	4.2	0.04	0.26	0.04	53.1
9	R2	All MCs	3	33.3	3	33.3	0.137	6.0	LOS A	0.5	4.2	0.04	0.26	0.04	36.9
Approach			228	11.1	228	11.1	0.137	2.7	NA	0.5	4.2	0.04	0.26	0.04	44.8
West: Ottiwell St															
10	L2	All MCs	6	0.0	6	0.0	0.006	5.8	LOS A	0.0	0.2	0.19	0.53	0.19	42.8
11	T1	All MCs	1	0.0	1	0.0	0.006	4.9	LOS A	0.0	0.2	0.19	0.53	0.19	31.4
12	R2	All MCs	1	0.0	1	0.0	0.006	6.5	LOS A	0.0	0.2	0.19	0.53	0.19	35.8
Approach			8	0.0	8	0.0	0.006	5.8	LOS A	0.0	0.2	0.19	0.53	0.19	41.1
All Vehicles			535	10.2	535	10.2	0.250	3.7	NA	1.0	7.0	0.19	0.39	0.19	44.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. AM_Sloane-Braidwood (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	43	14.6	43	14.6	0.493	11.6	LOS A	3.1	23.6	0.63	1.04	0.94	36.9
5	T1	All MCs	58	5.5	58	5.5	0.493	13.8	LOS A	3.1	23.6	0.63	1.04	0.94	37.5
6	R2	All MCs	188	8.9	188	8.9	0.493	16.1	LOS B	3.1	23.6	0.63	1.04	0.94	37.1
Approach			289	9.1	289	9.1	0.493	15.0	LOS B	3.1	23.6	0.63	1.04	0.94	37.2
NorthEast: Sloane St															
7	L2	All MCs	139	9.1	139	9.1	0.187	6.1	LOS A	0.9	6.4	0.20	0.33	0.20	47.5
8	T1	All MCs	137	8.5	137	8.5	0.187	0.3	LOS A	0.9	6.4	0.20	0.33	0.20	52.0
9	R2	All MCs	21	5.0	21	5.0	0.187	6.3	LOS A	0.9	6.4	0.20	0.33	0.20	46.4
Approach			297	8.5	297	8.5	0.187	3.4	NA	0.9	6.4	0.20	0.33	0.20	49.3
NorthWest: Mundy St															
10	L2	All MCs	14	0.0	14	0.0	0.100	8.8	LOS A	0.4	2.7	0.43	0.96	0.43	41.1
11	T1	All MCs	59	10.7	59	10.7	0.100	10.7	LOS A	0.4	2.7	0.43	0.96	0.43	40.5
12	R2	All MCs	4	0.0	4	0.0	0.100	10.7	LOS A	0.4	2.7	0.43	0.96	0.43	40.2
Approach			77	8.2	77	8.2	0.100	10.4	LOS A	0.4	2.7	0.43	0.96	0.43	40.6
SouthWest: Sloane St															
1	L2	All MCs	5	0.0	5	0.0	0.119	6.1	LOS A	0.2	1.7	0.09	0.13	0.09	51.7
2	T1	All MCs	177	8.3	177	8.3	0.119	0.1	LOS A	0.2	1.7	0.09	0.13	0.09	57.1
3	R2	All MCs	28	14.8	28	14.8	0.119	6.2	LOS A	0.2	1.7	0.09	0.13	0.09	48.3
Approach			211	9.0	211	9.0	0.119	1.1	NA	0.2	1.7	0.09	0.13	0.09	55.5
All Vehicles			874	8.8	874	8.8	0.493	7.3	NA	3.1	23.6	0.34	0.57	0.44	44.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. AM_Bungonia-Forbes (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	209	6.0	209	6.0	0.122	0.0	LOS A	0.1	0.8	0.03	0.05	0.03	59.3
6	R2	All MCs	17	6.3	17	6.3	0.122	5.7	LOS A	0.1	0.8	0.03	0.05	0.03	55.4
Approach			226	6.0	226	6.0	0.122	0.4	NA	0.1	0.8	0.03	0.05	0.03	59.0
North: Forbes St															
7	L2	All MCs	5	0.0	5	0.0	0.004	8.2	LOS A	0.0	0.1	0.13	0.90	0.13	48.5
9	R2	All MCs	18	0.0	18	0.0	0.021	8.8	LOS A	0.1	0.5	0.34	0.88	0.34	50.7
Approach			23	0.0	23	0.0	0.021	8.6	LOS A	0.1	0.5	0.29	0.88	0.29	50.3
West: Bungonia Rd															
10	L2	All MCs	17	0.0	17	0.0	0.035	5.5	LOS A	0.0	0.0	0.00	0.15	0.00	56.2
11	T1	All MCs	49	4.3	49	4.3	0.035	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	58.1
Approach			66	3.2	66	3.2	0.035	1.4	NA	0.0	0.0	0.00	0.15	0.00	57.5
All Vehicles			316	5.0	316	5.0	0.122	1.2	NA	0.1	0.8	0.04	0.13	0.04	57.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. AM_Bungonia-Memorial (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	213	4.5	213	4.5	0.115	5.4	LOS A	0.0	0.0	0.00	0.59	0.00	47.7
3	R2	All MCs	1	0.0	1	0.0	0.115	5.4	LOS A	0.0	0.0	0.00	0.59	0.00	48.6
Approach			214	4.4	214	4.4	0.115	5.4	NA	0.0	0.0	0.00	0.59	0.00	47.7
East: Memorial Rd															
4	L2	All MCs	1	0.0	1	0.0	0.019	5.7	LOS A	0.1	0.5	0.30	0.57	0.30	47.9
6a	R1	All MCs	16	26.7	16	26.7	0.019	6.6	LOS A	0.1	0.5	0.30	0.57	0.30	41.8
Approach			17	25.0	17	25.0	0.019	6.5	LOS A	0.1	0.5	0.30	0.57	0.30	42.2
NorthWest: Bungonia Rd															
27a	L1	All MCs	6	0.0	6	0.0	0.031	5.3	LOS A	0.1	1.1	0.01	0.57	0.01	47.2
29a	R1	All MCs	49	4.3	49	4.3	0.031	5.0	LOS A	0.1	1.1	0.01	0.57	0.01	48.8
Approach			56	3.8	56	3.8	0.031	5.1	NA	0.1	1.1	0.01	0.57	0.01	48.6
All Vehicles			286	5.5	286	5.5	0.115	5.4	NA	0.1	1.1	0.02	0.59	0.02	47.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. AM_Hume-Garoorigang (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	5	20.0	5	20.0	0.057	0.1	LOS A	0.3	2.2	0.10	0.54	0.10	55.0
6	R2	All MCs	86	19.5	86	19.5	0.057	5.8	LOS A	0.3	2.2	0.10	0.54	0.10	47.7
Approach			92	19.5	92	19.5	0.057	5.5	NA	0.3	2.2	0.10	0.54	0.10	48.3
North: Hume St															
7	L2	All MCs	27	3.8	27	3.8	0.025	5.6	LOS A	0.1	0.7	0.04	0.56	0.04	49.1
9	R2	All MCs	8	25.0	8	25.0	0.025	5.9	LOS A	0.1	0.7	0.04	0.56	0.04	47.5
Approach			36	8.8	36	8.8	0.025	5.7	LOS A	0.1	0.7	0.04	0.56	0.04	48.7
West: Mazamet Rd															
10	L2	All MCs	21	30.0	21	30.0	0.016	5.9	LOS A	0.0	0.0	0.00	0.48	0.00	48.5
11	T1	All MCs	4	25.0	4	25.0	0.016	0.0	LOS A	0.0	0.0	0.00	0.48	0.00	55.8
Approach			25	29.2	25	29.2	0.016	4.9	NA	0.0	0.0	0.00	0.48	0.00	50.1
All Vehicles			153	18.6	153	18.6	0.057	5.4	NA	0.3	2.2	0.07	0.53	0.07	48.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. AM_Lagoon-Union (Site Folder: 2027 Base)]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 112 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	44	0.0	44	0.0	0.715	51.2	LOS D	14.6	111.1	0.99	0.86	1.02	25.7
2	T1	All MCs	235	11.7	235	11.7	* 0.715	45.7	LOS D	14.6	111.1	0.99	0.86	1.02	23.7
3	R2	All MCs	118	25.9	118	25.9	0.128	16.7	LOS B	2.8	24.0	0.47	0.68	0.47	43.6
Approach			397	14.6	397	14.6	0.715	37.7	LOS C	14.6	111.1	0.83	0.81	0.86	29.6
East: Sydney Rd															
4	L2	All MCs	113	29.9	113	29.9	0.276	22.9	LOS B	6.2	51.9	0.74	0.72	0.74	36.8
5	T1	All MCs	217	6.3	217	6.3	0.276	34.1	LOS C	6.7	51.9	0.78	0.67	0.78	35.5
6	R2	All MCs	179	12.4	179	12.4	* 0.471	40.4	LOS C	8.1	62.6	0.86	0.80	0.86	27.8
Approach			508	13.7	508	13.7	0.471	33.9	LOS C	8.1	62.6	0.80	0.73	0.80	33.1
North: Union St															
7	L2	All MCs	140	9.8	140	9.8	* 0.667	43.0	LOS D	17.5	130.9	0.93	0.82	0.93	28.3
8	T1	All MCs	224	7.0	224	7.0	0.667	36.5	LOS C	17.5	130.9	0.93	0.82	0.93	26.3
9	R2	All MCs	209	13.1	209	13.1	0.406	39.1	LOS C	9.1	71.1	0.84	0.79	0.84	19.3
Approach			574	9.9	574	9.9	0.667	39.1	LOS C	17.5	130.9	0.90	0.81	0.90	24.5
West: Lagoon St															
10	L2	All MCs	71	13.4	71	13.4	0.061	12.0	LOS A	1.3	9.8	0.35	0.65	0.35	34.3
11	T1	All MCs	99	4.3	99	4.3	0.081	28.2	LOS B	1.9	13.5	0.73	0.56	0.73	36.5
12	R2	All MCs	25	4.2	25	4.2	0.090	40.8	LOS C	1.1	7.8	0.80	0.71	0.80	27.5
Approach			195	7.6	195	7.6	0.090	24.0	LOS B	1.9	13.5	0.60	0.61	0.60	34.4
All Vehicles			1674	11.9	1674	11.9	0.715	35.4	LOS C	17.5	130.9	0.82	0.76	0.82	29.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. AM_Sloane-Garoorigang (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	38	0.0	38	0.0	0.043	5.5	LOS A	0.0	0.0	0.00	0.28	0.00	54.7
2	T1	All MCs	43	0.0	43	0.0	0.043	0.0	LOS A	0.0	0.0	0.00	0.28	0.00	57.2
Approach			81	0.0	81	0.0	0.043	2.6	NA	0.0	0.0	0.00	0.28	0.00	56.0
North: Sloane St															
8	T1	All MCs	13	0.0	13	0.0	0.045	0.3	LOS A	0.2	1.8	0.20	0.47	0.20	55.0
9	R2	All MCs	54	31.4	54	31.4	0.045	6.2	LOS A	0.2	1.8	0.20	0.47	0.20	51.6
Approach			66	25.4	66	25.4	0.045	5.0	NA	0.2	1.8	0.20	0.47	0.20	52.2
West: Garoorigang Rd															
10	L2	All MCs	16	26.7	16	26.7	0.027	6.0	LOS A	0.1	0.7	0.15	0.55	0.15	51.3
12	R2	All MCs	18	0.0	18	0.0	0.027	5.9	LOS A	0.1	0.7	0.15	0.55	0.15	51.4
Approach			34	12.5	34	12.5	0.027	5.9	LOS A	0.1	0.7	0.15	0.55	0.15	51.4
All Vehicles			181	11.6	181	11.6	0.045	4.1	NA	0.2	1.8	0.10	0.40	0.10	53.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. AM_Windellama-Rifle (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	202	5.7	202	5.7	0.112	0.0	LOS A	0.1	0.4	0.01	0.03	0.01	59.7
3	R2	All MCs	8	0.0	8	0.0	0.112	5.5	LOS A	0.1	0.4	0.01	0.03	0.01	56.9
Approach			211	5.5	211	5.5	0.112	0.2	NA	0.1	0.4	0.01	0.03	0.01	59.6
East: Rifle Range Rd															
4	L2	All MCs	2	0.0	2	0.0	0.012	5.7	LOS A	0.0	0.3	0.24	0.56	0.24	52.3
6	R2	All MCs	11	0.0	11	0.0	0.012	6.4	LOS A	0.0	0.3	0.24	0.56	0.24	52.0
Approach			13	0.0	13	0.0	0.012	6.3	LOS A	0.0	0.3	0.24	0.56	0.24	52.0
North: Windellama Rd															
7	L2	All MCs	2	0.0	2	0.0	0.027	5.5	LOS A	0.0	0.0	0.00	0.03	0.00	57.3
8	T1	All MCs	47	8.9	47	8.9	0.027	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach			49	8.5	49	8.5	0.027	0.2	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles			273	5.8	273	5.8	0.112	0.5	NA	0.1	0.4	0.02	0.05	0.02	59.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. PM_Braidwood-Bungonia (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.069	5.9	LOS A	0.1	0.9	0.08	0.11	0.08	24.9
2	T1	All MCs	104	8.1	104	8.1	0.069	0.1	LOS A	0.1	0.9	0.08	0.11	0.08	56.9
3	R2	All MCs	18	5.9	18	5.9	0.069	5.9	LOS A	0.1	0.9	0.08	0.11	0.08	43.9
Approach			123	7.7	123	7.7	0.069	1.0	NA	0.1	0.9	0.08	0.11	0.08	55.3
East: Bungonia Rd															
4	L2	All MCs	14	7.7	14	7.7	0.010	4.5	LOS A	0.0	0.3	0.21	0.51	0.21	34.8
5	T1	All MCs	1	0.0	1	0.0	0.263	4.7	LOS A	1.0	7.5	0.48	0.71	0.48	31.6
6	R2	All MCs	183	10.3	183	10.3	0.263	6.8	LOS A	1.0	7.5	0.48	0.71	0.48	37.4
Approach			198	10.1	198	10.1	0.263	6.7	LOS A	1.0	7.5	0.46	0.70	0.46	37.2
North: Braidwood Rd															
7	L2	All MCs	195	9.7	195	9.7	0.199	5.8	LOS A	0.9	7.1	0.08	0.34	0.08	36.4
8	T1	All MCs	120	5.3	120	5.3	0.199	0.1	LOS A	0.9	7.1	0.08	0.34	0.08	51.4
9	R2	All MCs	6	33.3	6	33.3	0.199	6.3	LOS A	0.9	7.1	0.08	0.34	0.08	36.1
Approach			321	8.5	321	8.5	0.199	3.6	NA	0.9	7.1	0.08	0.34	0.08	41.3
West: Ottiwell St															
10	L2	All MCs	11	20.0	11	20.0	0.010	6.0	LOS A	0.0	0.3	0.22	0.53	0.22	38.8
11	T1	All MCs	1	0.0	1	0.0	0.010	5.1	LOS A	0.0	0.3	0.22	0.53	0.22	31.2
12	R2	All MCs	1	0.0	1	0.0	0.010	6.7	LOS A	0.0	0.3	0.22	0.53	0.22	35.6
Approach			13	16.7	13	16.7	0.010	6.0	LOS A	0.0	0.3	0.22	0.53	0.22	38.2
All Vehicles			655	9.0	655	9.0	0.263	4.1	NA	1.0	7.5	0.20	0.41	0.20	42.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. PM_Sloane-Braidwood (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	47	26.7	47	26.7	0.674	15.8	LOS B	5.1	38.8	0.79	1.23	1.60	31.2
5	T1	All MCs	56	3.8	56	3.8	0.674	19.8	LOS B	5.1	38.8	0.79	1.23	1.60	32.7
6	R2	All MCs	195	9.2	195	9.2	0.674	24.4	LOS B	5.1	38.8	0.79	1.23	1.60	32.3
Approach			298	11.0	298	11.0	0.674	22.2	LOS B	5.1	38.8	0.79	1.23	1.60	32.2
NorthEast: Sloane St															
7	L2	All MCs	198	5.9	198	5.9	0.263	6.2	LOS A	1.3	9.7	0.28	0.38	0.28	47.5
8	T1	All MCs	169	5.0	169	5.0	0.263	0.6	LOS A	1.3	9.7	0.28	0.38	0.28	51.0
9	R2	All MCs	41	5.1	41	5.1	0.263	6.8	LOS A	1.3	9.7	0.28	0.38	0.28	45.6
Approach			408	5.4	408	5.4	0.263	3.9	NA	1.3	9.7	0.28	0.38	0.28	48.6
NorthWest: Mundy St															
10	L2	All MCs	18	5.9	18	5.9	0.177	9.5	LOS A	0.6	4.9	0.54	1.00	0.54	38.6
11	T1	All MCs	78	13.5	78	13.5	0.177	12.8	LOS A	0.6	4.9	0.54	1.00	0.54	38.6
12	R2	All MCs	11	10.0	11	10.0	0.177	13.9	LOS A	0.6	4.9	0.54	1.00	0.54	37.3
Approach			106	11.9	106	11.9	0.177	12.4	LOS A	0.6	4.9	0.54	1.00	0.54	38.5
SouthWest: Sloane St															
1	L2	All MCs	14	0.0	14	0.0	0.176	6.2	LOS A	0.4	2.8	0.12	0.16	0.12	51.3
2	T1	All MCs	254	6.6	254	6.6	0.176	0.2	LOS A	0.4	2.8	0.12	0.16	0.12	56.7
3	R2	All MCs	43	14.6	43	14.6	0.176	6.4	LOS A	0.4	2.8	0.12	0.16	0.12	48.1
Approach			311	7.5	311	7.5	0.176	1.3	NA	0.4	2.8	0.12	0.16	0.12	54.9
All Vehicles			1123	8.1	1123	8.1	0.674	8.8	NA	5.1	38.8	0.39	0.60	0.61	42.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. PM_Bungonia-Forbes (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	131	11.3	131	11.3	0.081	0.1	LOS A	0.1	0.7	0.06	0.08	0.06	58.9
6	R2	All MCs	14	0.0	14	0.0	0.081	6.1	LOS A	0.1	0.7	0.06	0.08	0.06	55.5
Approach			144	10.2	144	10.2	0.081	0.6	NA	0.1	0.7	0.06	0.08	0.06	58.5
North: Forbes St															
7	L2	All MCs	18	0.0	18	0.0	0.014	8.5	LOS A	0.1	0.4	0.25	0.86	0.25	48.5
9	R2	All MCs	17	12.5	17	12.5	0.022	9.6	LOS A	0.1	0.5	0.36	0.89	0.36	50.0
Approach			35	6.1	35	6.1	0.022	9.1	LOS A	0.1	0.5	0.30	0.88	0.30	49.3
West: Bungonia Rd															
10	L2	All MCs	26	4.0	26	4.0	0.091	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	56.5
11	T1	All MCs	142	8.1	142	8.1	0.091	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	58.8
Approach			168	7.5	168	7.5	0.091	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.3
All Vehicles			347	8.5	347	8.5	0.091	1.6	NA	0.1	0.7	0.06	0.17	0.06	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. PM_Bungonia-Memorial (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	104	13.1	104	13.1	0.061	5.5	LOS A	0.0	0.1	0.00	0.59	0.00	46.4
3	R2	All MCs	2	50.0	2	50.0	0.061	6.1	LOS A	0.0	0.1	0.00	0.59	0.00	41.3
Approach			106	13.9	106	13.9	0.061	5.5	NA	0.0	0.1	0.00	0.59	0.00	46.3
East: Memorial Rd															
4	L2	All MCs	2	0.0	2	0.0	0.042	6.0	LOS A	0.1	1.0	0.31	0.59	0.31	48.1
6a	R1	All MCs	40	2.6	40	2.6	0.042	6.0	LOS A	0.1	1.0	0.31	0.59	0.31	45.6
Approach			42	2.5	42	2.5	0.042	6.0	LOS A	0.1	1.0	0.31	0.59	0.31	45.8
NorthWest: Bungonia Rd															
27a	L1	All MCs	12	0.0	12	0.0	0.093	5.3	LOS A	0.5	3.4	0.02	0.56	0.02	47.1
29a	R1	All MCs	149	7.7	149	7.7	0.093	5.1	LOS A	0.5	3.4	0.02	0.56	0.02	48.5
Approach			161	7.2	161	7.2	0.093	5.1	NA	0.5	3.4	0.02	0.56	0.02	48.4
All Vehicles			309	8.8	309	8.8	0.093	5.3	NA	0.5	3.4	0.06	0.58	0.06	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. PM_Hume-Garoorigang (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	3	0.0	3	0.0	0.059	0.4	LOS A	0.3	2.1	0.24	0.55	0.24	54.5
6	R2	All MCs	86	11.0	86	11.0	0.059	6.0	LOS A	0.3	2.1	0.24	0.55	0.24	47.7
Approach			89	10.6	89	10.6	0.059	5.8	NA	0.3	2.1	0.24	0.55	0.24	48.0
North: Hume St															
7	L2	All MCs	82	15.4	82	15.4	0.069	5.9	LOS A	0.3	2.2	0.15	0.54	0.15	48.0
9	R2	All MCs	13	16.7	13	16.7	0.069	6.5	LOS A	0.3	2.2	0.15	0.54	0.15	47.5
Approach			95	15.6	95	15.6	0.069	6.0	LOS A	0.3	2.2	0.15	0.54	0.15	47.9
West: Mazamet Rd															
10	L2	All MCs	68	12.3	68	12.3	0.067	5.7	LOS A	0.0	0.0	0.00	0.33	0.00	51.4
11	T1	All MCs	53	0.0	53	0.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.33	0.00	57.2
Approach			121	7.0	121	7.0	0.067	3.2	NA	0.0	0.0	0.00	0.33	0.00	54.4
All Vehicles			305	10.7	305	10.7	0.069	4.8	NA	0.3	2.2	0.12	0.46	0.12	50.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. PM_Lagoon-Union (Site Folder: 2027 Base)]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 173 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	38	2.8	38	2.8	0.685	70.1	LOS E	24.6	178.7	0.95	0.83	0.95	22.4
2	T1	All MCs	293	4.7	293	4.7	* 0.685	64.5	LOS E	24.6	178.7	0.95	0.83	0.95	20.3
3	R2	All MCs	168	19.4	168	19.4	0.164	25.3	LOS B	5.7	46.5	0.44	0.69	0.44	42.1
Approach			499	9.5	499	9.5	0.685	51.7	LOS D	24.6	178.7	0.78	0.78	0.78	25.4
East: Sydney Rd															
4	L2	All MCs	134	13.4	134	13.4	0.254	33.7	LOS C	9.4	71.8	0.74	0.74	0.74	31.7
5	T1	All MCs	182	1.2	182	1.2	0.254	54.8	LOS D	9.5	71.8	0.78	0.67	0.78	29.0
6	R2	All MCs	185	6.3	185	6.3	* 0.585	64.2	LOS E	13.6	100.3	0.92	0.83	0.92	21.5
Approach			501	6.3	501	6.3	0.585	52.6	LOS D	13.6	100.3	0.82	0.75	0.82	26.8
North: Union St															
7	L2	All MCs	153	17.2	153	17.2	0.743	72.4	LOS F	27.8	211.5	0.96	0.85	0.96	22.2
8	T1	All MCs	216	5.4	216	5.4	* 0.743	66.8	LOS E	27.8	211.5	0.96	0.85	0.96	20.1
9	R2	All MCs	159	11.9	159	11.9	0.309	63.9	LOS E	10.2	78.9	0.82	0.78	0.82	15.4
Approach			527	10.8	527	10.8	0.743	67.6	LOS E	27.8	211.5	0.92	0.83	0.92	17.8
West: Lagoon St															
10	L2	All MCs	109	1.0	109	1.0	0.092	17.4	LOS B	3.3	23.6	0.40	0.67	0.40	30.0
11	T1	All MCs	189	2.8	189	2.8	0.162	48.3	LOS D	5.8	41.6	0.76	0.61	0.76	29.4
12	R2	All MCs	18	0.0	18	0.0	0.065	64.5	LOS E	1.1	8.0	0.79	0.70	0.79	22.5
Approach			317	2.0	317	2.0	0.162	38.6	LOS C	5.8	41.6	0.64	0.64	0.64	28.2
All Vehicles			1844	7.7	1844	7.7	0.743	54.2	LOS D	27.8	211.5	0.81	0.76	0.81	23.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. PM_Sloane-Garoorigang (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	35	3.0	35	3.0	0.050	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	55.1
2	T1	All MCs	60	0.0	60	0.0	0.050	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.8
Approach			95	1.1	95	1.1	0.050	2.1	NA	0.0	0.0	0.00	0.22	0.00	56.8
North: Sloane St															
8	T1	All MCs	15	14.3	15	14.3	0.042	0.3	LOS A	0.2	1.5	0.20	0.45	0.20	54.8
9	R2	All MCs	52	12.2	52	12.2	0.042	5.9	LOS A	0.2	1.5	0.20	0.45	0.20	52.3
Approach			66	12.7	66	12.7	0.042	4.7	NA	0.2	1.5	0.20	0.45	0.20	52.8
West: Garoorigang Rd															
10	L2	All MCs	85	13.6	85	13.6	0.100	5.9	LOS A	0.4	2.9	0.17	0.55	0.17	51.7
12	R2	All MCs	47	0.0	47	0.0	0.100	6.0	LOS A	0.4	2.9	0.17	0.55	0.17	51.4
Approach			133	8.7	133	8.7	0.100	5.9	LOS A	0.4	2.9	0.17	0.55	0.17	51.6
All Vehicles			294	7.2	294	7.2	0.100	4.4	NA	0.4	2.9	0.12	0.42	0.12	53.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. PM_Windellama-Rifle (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	98	11.8	98	11.8	0.059	0.1	LOS A	0.0	0.4	0.04	0.05	0.04	59.6
3	R2	All MCs	5	40.0	5	40.0	0.059	6.6	LOS A	0.0	0.4	0.04	0.05	0.04	54.8
Approach			103	13.3	103	13.3	0.059	0.4	NA	0.0	0.4	0.04	0.05	0.04	59.4
East: Rifle Range Rd															
4	L2	All MCs	4	0.0	4	0.0	0.015	5.9	LOS A	0.0	0.4	0.28	0.57	0.28	52.1
6	R2	All MCs	11	20.0	11	20.0	0.015	6.8	LOS A	0.0	0.4	0.28	0.57	0.28	51.0
Approach			15	14.3	15	14.3	0.015	6.6	LOS A	0.0	0.4	0.28	0.57	0.28	51.3
North: Windellama Rd															
7	L2	All MCs	12	0.0	12	0.0	0.080	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	57.0
8	T1	All MCs	136	8.5	136	8.5	0.080	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			147	7.9	147	7.9	0.080	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles			265	10.3	265	10.3	0.080	0.8	NA	0.0	0.4	0.03	0.08	0.03	58.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. SAT_Braidwood-Bungonia (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.057	5.9	LOS A	0.1	0.4	0.04	0.06	0.04	25.4
2	T1	All MCs	96	6.6	96	6.6	0.057	0.0	LOS A	0.1	0.4	0.04	0.06	0.04	58.4
3	R2	All MCs	7	14.3	7	14.3	0.057	6.0	LOS A	0.1	0.4	0.04	0.06	0.04	45.3
Approach			104	7.1	104	7.1	0.057	0.5	NA	0.1	0.4	0.04	0.06	0.04	57.4
East: Bungonia Rd															
4	L2	All MCs	5	20.0	5	20.0	0.004	4.5	LOS A	0.0	0.1	0.21	0.50	0.21	33.7
5	T1	All MCs	1	0.0	1	0.0	0.203	4.3	LOS A	0.7	5.4	0.41	0.66	0.41	33.1
6	R2	All MCs	160	3.9	160	3.9	0.203	6.0	LOS A	0.7	5.4	0.41	0.66	0.41	39.8
Approach			166	4.4	166	4.4	0.203	5.9	LOS A	0.7	5.4	0.41	0.66	0.41	39.6
North: Braidwood Rd															
7	L2	All MCs	156	7.4	156	7.4	0.163	5.7	LOS A	0.7	5.4	0.05	0.32	0.05	36.8
8	T1	All MCs	112	3.8	112	3.8	0.163	0.0	LOS A	0.7	5.4	0.05	0.32	0.05	52.1
9	R2	All MCs	3	0.0	3	0.0	0.163	5.6	LOS A	0.7	5.4	0.05	0.32	0.05	37.8
Approach			271	5.8	271	5.8	0.163	3.4	NA	0.7	5.4	0.05	0.32	0.05	42.4
West: Ottiwell St															
10	L2	All MCs	5	0.0	5	0.0	0.006	5.8	LOS A	0.0	0.1	0.21	0.53	0.21	42.8
11	T1	All MCs	1	0.0	1	0.0	0.006	4.9	LOS A	0.0	0.1	0.21	0.53	0.21	31.3
12	R2	All MCs	1	0.0	1	0.0	0.006	6.5	LOS A	0.0	0.1	0.21	0.53	0.21	35.7
Approach			7	0.0	7	0.0	0.006	5.8	LOS A	0.0	0.1	0.21	0.53	0.21	40.8
All Vehicles			548	5.6	548	5.6	0.203	3.6	NA	0.7	5.4	0.16	0.38	0.16	43.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. SAT_Sloane-Braidwood (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	35	12.1	35	12.1	0.475	11.9	LOS A	2.6	19.4	0.67	1.08	0.99	36.2
5	T1	All MCs	51	4.2	51	4.2	0.475	15.0	LOS B	2.6	19.4	0.67	1.08	0.99	36.7
6	R2	All MCs	158	6.0	158	6.0	0.475	17.3	LOS B	2.6	19.4	0.67	1.08	0.99	36.5
Approach			243	6.5	243	6.5	0.475	16.0	LOS B	2.6	19.4	0.67	1.08	0.99	36.5
NorthEast: Sloane St															
7	L2	All MCs	179	4.7	179	4.7	0.261	6.0	LOS A	1.3	9.1	0.21	0.33	0.21	48.5
8	T1	All MCs	206	1.5	206	1.5	0.261	0.3	LOS A	1.3	9.1	0.21	0.33	0.21	52.2
9	R2	All MCs	44	0.0	44	0.0	0.261	6.2	LOS A	1.3	9.1	0.21	0.33	0.21	47.4
Approach			429	2.7	429	2.7	0.261	3.3	NA	1.3	9.1	0.21	0.33	0.21	50.0
NorthWest: Mundy St															
10	L2	All MCs	17	0.0	17	0.0	0.089	8.7	LOS A	0.3	2.3	0.45	0.93	0.45	40.7
11	T1	All MCs	45	4.7	45	4.7	0.089	11.0	LOS A	0.3	2.3	0.45	0.93	0.45	41.1
12	R2	All MCs	4	0.0	4	0.0	0.089	11.6	LOS A	0.3	2.3	0.45	0.93	0.45	39.9
Approach			66	3.2	66	3.2	0.089	10.5	LOS A	0.3	2.3	0.45	0.93	0.45	41.0
SouthWest: Sloane St															
1	L2	All MCs	4	0.0	4	0.0	0.126	6.2	LOS A	0.3	2.3	0.15	0.19	0.15	50.7
2	T1	All MCs	178	1.8	178	1.8	0.126	0.2	LOS A	0.3	2.3	0.15	0.19	0.15	55.9
3	R2	All MCs	44	2.4	44	2.4	0.126	6.2	LOS A	0.3	2.3	0.15	0.19	0.15	50.4
Approach			226	1.9	226	1.9	0.126	1.5	NA	0.3	2.3	0.15	0.19	0.15	54.6
All Vehicles			965	3.5	965	3.5	0.475	6.6	NA	2.6	19.4	0.33	0.53	0.41	45.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. SAT_Bungonia-Forbes (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	104	1.0	104	1.0	0.056	0.0	LOS A	0.0	0.1	0.02	0.02	0.02	59.7
6	R2	All MCs	3	0.0	3	0.0	0.056	5.6	LOS A	0.0	0.1	0.02	0.02	0.02	56.2
Approach			107	1.0	107	1.0	0.056	0.2	NA	0.0	0.1	0.02	0.02	0.02	59.6
North: Forbes St															
7	L2	All MCs	18	11.8	18	11.8	0.015	8.9	LOS A	0.1	0.4	0.21	0.89	0.21	47.1
9	R2	All MCs	24	0.0	24	0.0	0.026	8.4	LOS A	0.1	0.6	0.29	0.88	0.29	50.9
Approach			42	5.0	42	5.0	0.026	8.6	LOS A	0.1	0.6	0.26	0.88	0.26	49.5
West: Bungonia Rd															
10	L2	All MCs	18	5.9	18	5.9	0.064	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	56.5
11	T1	All MCs	102	4.1	102	4.1	0.064	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	58.9
Approach			120	4.4	120	4.4	0.064	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.4
All Vehicles			269	3.1	269	3.1	0.064	1.8	NA	0.1	0.6	0.05	0.19	0.05	57.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. SAT_Bungonia-Memorial (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	116	2.7	116	2.7	0.063	5.4	LOS A	0.0	0.1	0.00	0.59	0.00	48.0
3	R2	All MCs	2	0.0	2	0.0	0.063	5.4	LOS A	0.0	0.1	0.00	0.59	0.00	48.6
Approach			118	2.7	118	2.7	0.063	5.4	NA	0.0	0.1	0.00	0.59	0.00	48.0
East: Memorial Rd															
4	L2	All MCs	2	0.0	2	0.0	0.007	5.8	LOS A	0.0	0.2	0.24	0.54	0.24	48.2
6a	R1	All MCs	6	0.0	6	0.0	0.007	5.7	LOS A	0.0	0.2	0.24	0.54	0.24	46.3
Approach			8	0.0	8	0.0	0.007	5.7	LOS A	0.0	0.2	0.24	0.54	0.24	46.8
NorthWest: Bungonia Rd															
27a	L1	All MCs	5	0.0	5	0.0	0.061	5.3	LOS A	0.3	2.1	0.02	0.56	0.02	47.1
29a	R1	All MCs	103	3.1	103	3.1	0.061	5.0	LOS A	0.3	2.1	0.02	0.56	0.02	48.8
Approach			108	2.9	108	2.9	0.061	5.0	NA	0.3	2.1	0.02	0.56	0.02	48.8
All Vehicles			235	2.7	235	2.7	0.063	5.2	NA	0.3	2.1	0.02	0.58	0.02	48.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. SAT_Hume-Garoorigang (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	5	0.0	5	0.0	0.055	0.0	LOS A	0.3	1.9	0.07	0.54	0.07	55.1
6	R2	All MCs	92	3.4	92	3.4	0.055	5.5	LOS A	0.3	1.9	0.07	0.54	0.07	48.9
Approach			97	3.3	97	3.3	0.055	5.2	NA	0.3	1.9	0.07	0.54	0.07	49.4
North: Hume St															
7	L2	All MCs	83	2.5	83	2.5	0.053	5.6	LOS A	0.2	1.6	0.03	0.56	0.03	49.2
9	R2	All MCs	2	0.0	2	0.0	0.053	5.5	LOS A	0.2	1.6	0.03	0.56	0.03	49.0
Approach			85	2.5	85	2.5	0.053	5.6	LOS A	0.2	1.6	0.03	0.56	0.03	49.2
West: Mazamet Rd															
10	L2	All MCs	12	0.0	12	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.43	0.00	51.1
11	T1	All MCs	4	0.0	4	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.43	0.00	56.2
Approach			16	0.0	16	0.0	0.008	4.1	NA	0.0	0.0	0.00	0.43	0.00	52.8
All Vehicles			198	2.7	198	2.7	0.055	5.3	NA	0.3	1.9	0.05	0.54	0.05	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. SAT_Lagoon-Union (Site Folder: 2027 Base)]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 112 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	9	0.0	9	0.0	0.480	42.8	LOS D	11.4	81.0	0.89	0.75	0.89	28.8
2	T1	All MCs	238	1.8	238	1.8	* 0.480	37.2	LOS C	11.4	81.0	0.89	0.75	0.89	26.9
3	R2	All MCs	144	4.4	144	4.4	0.116	11.9	LOS A	2.6	19.0	0.36	0.66	0.36	47.2
Approach			392	2.7	392	2.7	0.480	28.0	LOS B	11.4	81.0	0.70	0.72	0.70	34.5
East: Sydney Rd															
4	L2	All MCs	133	4.0	133	4.0	0.240	17.7	LOS B	6.4	45.7	0.68	0.71	0.68	38.9
5	T1	All MCs	221	0.0	221	0.0	0.240	31.6	LOS C	6.4	45.7	0.72	0.63	0.72	37.5
6	R2	All MCs	135	3.1	135	3.1	* 0.328	35.6	LOS C	5.5	39.8	0.79	0.77	0.79	29.7
Approach			488	1.9	488	1.9	0.328	28.9	LOS C	6.4	45.7	0.73	0.69	0.73	35.7
North: Union St															
7	L2	All MCs	168	5.6	168	5.6	0.933	72.2	LOS F	23.8	171.3	1.00	1.12	1.37	20.5
8	T1	All MCs	188	1.1	188	1.1	* 0.933	66.7	LOS E	23.8	171.3	1.00	1.12	1.37	18.3
9	R2	All MCs	140	0.8	140	0.8	0.369	47.3	LOS D	6.7	46.9	0.91	0.79	0.91	17.5
Approach			497	2.5	497	2.5	0.933	63.1	LOS E	23.8	171.3	0.97	1.03	1.24	19.0
West: Lagoon St															
10	L2	All MCs	88	0.0	88	0.0	0.076	14.2	LOS A	1.9	13.0	0.42	0.67	0.42	32.7
11	T1	All MCs	179	1.2	179	1.2	0.126	25.1	LOS B	3.2	22.7	0.70	0.56	0.70	38.1
12	R2	All MCs	12	0.0	12	0.0	0.034	35.1	LOS C	0.4	3.1	0.73	0.68	0.73	29.6
Approach			279	0.8	279	0.8	0.126	22.1	LOS B	3.2	22.7	0.61	0.60	0.61	36.6
All Vehicles			1656	2.1	1656	2.1	0.933	37.8	LOS C	23.8	171.3	0.78	0.78	0.85	29.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. SAT_Sloane-Garoorigang (Site Folder: 2027 Base)]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	40	0.0	40	0.0	0.036	5.5	LOS A	0.0	0.0	0.00	0.35	0.00	54.1
2	T1	All MCs	27	3.8	27	3.8	0.036	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	56.4
Approach			67	1.6	67	1.6	0.036	3.3	NA	0.0	0.0	0.00	0.35	0.00	55.0
North: Sloane St															
8	T1	All MCs	23	0.0	23	0.0	0.047	0.2	LOS A	0.2	1.6	0.16	0.41	0.16	55.4
9	R2	All MCs	56	5.7	56	5.7	0.047	5.7	LOS A	0.2	1.6	0.16	0.41	0.16	53.1
Approach			79	4.0	79	4.0	0.047	4.1	NA	0.2	1.6	0.16	0.41	0.16	53.7
West: Garoorigang Rd															
10	L2	All MCs	22	9.5	22	9.5	0.067	5.7	LOS A	0.2	1.7	0.15	0.56	0.15	52.0
12	R2	All MCs	61	0.0	61	0.0	0.067	5.9	LOS A	0.2	1.7	0.15	0.56	0.15	51.5
Approach			83	2.5	83	2.5	0.067	5.9	LOS A	0.2	1.7	0.15	0.56	0.15	51.6
All Vehicles			229	2.8	229	2.8	0.067	4.5	NA	0.2	1.7	0.11	0.45	0.11	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. SAT_Windellama-Rifle (*) (Site Folder: 2027 Base)]

Weekday PM Flows Used
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	98	11.8	98	11.8	0.059	0.1	LOS A	0.0	0.4	0.04	0.05	0.04	59.6
3	R2	All MCs	5	40.0	5	40.0	0.059	6.6	LOS A	0.0	0.4	0.04	0.05	0.04	54.8
Approach			103	13.3	103	13.3	0.059	0.4	NA	0.0	0.4	0.04	0.05	0.04	59.4
East: Rifle Range Rd															
4	L2	All MCs	4	0.0	4	0.0	0.015	5.9	LOS A	0.0	0.4	0.28	0.57	0.28	52.1
6	R2	All MCs	11	20.0	11	20.0	0.015	6.8	LOS A	0.0	0.4	0.28	0.57	0.28	51.0
Approach			15	14.3	15	14.3	0.015	6.6	LOS A	0.0	0.4	0.28	0.57	0.28	51.3
North: Windellama Rd															
7	L2	All MCs	12	0.0	12	0.0	0.080	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	57.0
8	T1	All MCs	136	8.5	136	8.5	0.080	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			147	7.9	147	7.9	0.080	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles			265	10.3	265	10.3	0.080	0.8	NA	0.0	0.4	0.03	0.08	0.03	58.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. AM_Braidwood-Bungonia (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.051	6.0	LOS A	0.0	0.4	0.04	0.07	0.04	25.3
2	T1	All MCs	79	20.0	79	20.0	0.051	0.0	LOS A	0.0	0.4	0.04	0.07	0.04	58.2
3	R2	All MCs	6	16.7	6	16.7	0.051	6.1	LOS A	0.0	0.4	0.04	0.07	0.04	44.9
Approach			86	19.5	86	19.5	0.051	0.6	NA	0.0	0.4	0.04	0.07	0.04	57.0
East: Bungonia Rd															
4	L2	All MCs	11	10.0	11	10.0	0.008	4.5	LOS A	0.0	0.2	0.22	0.51	0.22	34.5
5	T1	All MCs	1	0.0	1	0.0	0.288	4.4	LOS A	1.1	8.4	0.45	0.68	0.45	32.5
6	R2	All MCs	220	8.1	220	8.1	0.288	6.3	LOS A	1.1	8.4	0.45	0.68	0.45	38.5
Approach			232	8.2	232	8.2	0.288	6.2	LOS A	1.1	8.4	0.44	0.67	0.44	38.4
North: Braidwood Rd															
7	L2	All MCs	151	9.8	151	9.8	0.167	5.7	LOS A	0.7	5.7	0.05	0.31	0.05	36.8
8	T1	All MCs	119	13.3	119	13.3	0.167	0.0	LOS A	0.7	5.7	0.05	0.31	0.05	52.2
9	R2	All MCs	3	33.3	3	33.3	0.167	6.0	LOS A	0.7	5.7	0.05	0.31	0.05	36.5
Approach			273	11.6	273	11.6	0.167	3.2	NA	0.7	5.7	0.05	0.31	0.05	42.8
West: Ottiwell St															
10	L2	All MCs	6	0.0	6	0.0	0.006	5.8	LOS A	0.0	0.2	0.19	0.53	0.19	42.8
11	T1	All MCs	1	0.0	1	0.0	0.006	4.9	LOS A	0.0	0.2	0.19	0.53	0.19	31.4
12	R2	All MCs	1	0.0	1	0.0	0.006	6.5	LOS A	0.0	0.2	0.19	0.53	0.19	35.8
Approach			8	0.0	8	0.0	0.006	5.8	LOS A	0.0	0.2	0.19	0.53	0.19	41.1
All Vehicles			599	11.2	599	11.2	0.288	4.0	NA	1.1	8.4	0.20	0.42	0.20	42.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. AM_Sloane-Braidwood (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	43	14.6	43	14.6	0.567	12.5	LOS A	4.0	30.5	0.69	1.09	1.15	35.5
5	T1	All MCs	58	5.5	58	5.5	0.567	15.3	LOS B	4.0	30.5	0.69	1.09	1.15	36.1
6	R2	All MCs	208	11.1	208	11.1	0.567	18.3	LOS B	4.0	30.5	0.69	1.09	1.15	35.5
Approach			309	10.5	309	10.5	0.567	16.9	LOS B	4.0	30.5	0.69	1.09	1.15	35.6
NorthEast: Sloane St															
7	L2	All MCs	166	11.4	166	11.4	0.210	6.2	LOS A	1.0	7.6	0.23	0.36	0.23	46.7
8	T1	All MCs	137	8.5	137	8.5	0.210	0.4	LOS A	1.0	7.6	0.23	0.36	0.23	51.5
9	R2	All MCs	21	5.0	21	5.0	0.210	6.3	LOS A	1.0	7.6	0.23	0.36	0.23	46.0
Approach			324	9.7	324	9.7	0.210	3.7	NA	1.0	7.6	0.23	0.36	0.23	48.4
NorthWest: Mundy St															
10	L2	All MCs	14	0.0	14	0.0	0.102	8.8	LOS A	0.4	2.8	0.44	0.96	0.44	40.9
11	T1	All MCs	59	10.7	59	10.7	0.102	10.9	LOS A	0.4	2.8	0.44	0.96	0.44	40.4
12	R2	All MCs	4	0.0	4	0.0	0.102	10.9	LOS A	0.4	2.8	0.44	0.96	0.44	40.1
Approach			77	8.2	77	8.2	0.102	10.5	LOS A	0.4	2.8	0.44	0.96	0.44	40.5
SouthWest: Sloane St															
1	L2	All MCs	5	0.0	5	0.0	0.130	6.0	LOS A	0.3	2.5	0.13	0.17	0.13	50.8
2	T1	All MCs	177	8.3	177	8.3	0.130	0.2	LOS A	0.3	2.5	0.13	0.17	0.13	56.1
3	R2	All MCs	45	9.3	45	9.3	0.130	6.1	LOS A	0.3	2.5	0.13	0.17	0.13	48.9
Approach			227	8.3	227	8.3	0.130	1.5	NA	0.3	2.5	0.13	0.17	0.13	54.2
All Vehicles			938	9.5	938	9.5	0.567	8.1	NA	4.0	30.5	0.37	0.60	0.53	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. AM_Bungonia-Forbes (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	229	8.3	229	8.3	0.135	0.0	LOS A	0.1	0.9	0.04	0.05	0.04	59.3
6	R2	All MCs	17	6.3	17	6.3	0.135	5.9	LOS A	0.1	0.9	0.04	0.05	0.04	55.4
Approach			246	8.1	246	8.1	0.135	0.4	NA	0.1	0.9	0.04	0.05	0.04	59.0
North: Forbes St															
7	L2	All MCs	5	0.0	5	0.0	0.004	8.3	LOS A	0.0	0.1	0.19	0.87	0.19	48.5
9	R2	All MCs	18	0.0	18	0.0	0.022	9.2	LOS A	0.1	0.5	0.38	0.88	0.38	50.4
Approach			23	0.0	23	0.0	0.022	9.0	LOS A	0.1	0.5	0.34	0.88	0.34	50.1
West: Bungonia Rd															
10	L2	All MCs	17	0.0	17	0.0	0.060	5.6	LOS A	0.0	0.0	0.00	0.09	0.00	56.7
11	T1	All MCs	94	9.0	94	9.0	0.060	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	58.8
Approach			111	7.6	111	7.6	0.060	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.4
All Vehicles			380	7.5	380	7.5	0.135	1.1	NA	0.1	0.9	0.05	0.11	0.05	58.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. AM_Bungonia-Memorial (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	233	6.8	233	6.8	0.128	5.4	LOS A	0.0	0.0	0.00	0.59	0.00	47.4
3	R2	All MCs	1	0.0	1	0.0	0.128	5.4	LOS A	0.0	0.0	0.00	0.59	0.00	48.6
Approach			234	6.8	234	6.8	0.128	5.4	NA	0.0	0.0	0.00	0.59	0.00	47.4
East: Memorial Rd															
4	L2	All MCs	1	0.0	1	0.0	0.021	5.9	LOS A	0.1	0.6	0.37	0.61	0.37	47.4
6a	R1	All MCs	16	26.7	16	26.7	0.021	7.2	LOS A	0.1	0.6	0.37	0.61	0.37	41.2
Approach			17	25.0	17	25.0	0.021	7.1	LOS A	0.1	0.6	0.37	0.61	0.37	41.6
NorthWest: Bungonia Rd															
27a	L1	All MCs	6	0.0	6	0.0	0.071	5.3	LOS A	0.3	2.6	0.01	0.57	0.01	47.2
29a	R1	All MCs	114	13.0	114	13.0	0.071	5.1	LOS A	0.3	2.6	0.01	0.57	0.01	48.3
Approach			120	12.3	120	12.3	0.071	5.1	NA	0.3	2.6	0.01	0.57	0.01	48.2
All Vehicles			371	9.4	371	9.4	0.128	5.4	NA	0.3	2.6	0.02	0.59	0.02	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. AM_Hume-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	5	20.0	5	20.0	0.057	0.1	LOS A	0.3	2.2	0.10	0.54	0.10	55.0
6	R2	All MCs	86	19.5	86	19.5	0.057	5.8	LOS A	0.3	2.2	0.10	0.54	0.10	47.7
Approach			92	19.5	92	19.5	0.057	5.5	NA	0.3	2.2	0.10	0.54	0.10	48.3
North: Hume St															
7	L2	All MCs	35	3.0	35	3.0	0.030	5.6	LOS A	0.1	0.8	0.04	0.56	0.04	49.1
9	R2	All MCs	8	25.0	8	25.0	0.030	5.9	LOS A	0.1	0.8	0.04	0.56	0.04	47.5
Approach			43	7.3	43	7.3	0.030	5.6	LOS A	0.1	0.8	0.04	0.56	0.04	48.8
West: Mazamet Rd															
10	L2	All MCs	21	30.0	21	30.0	0.016	5.9	LOS A	0.0	0.0	0.00	0.48	0.00	48.5
11	T1	All MCs	4	25.0	4	25.0	0.016	0.0	LOS A	0.0	0.0	0.00	0.48	0.00	55.8
Approach			25	29.2	25	29.2	0.016	4.9	NA	0.0	0.0	0.00	0.48	0.00	50.1
All Vehicles			160	17.8	160	17.8	0.057	5.4	NA	0.3	2.2	0.07	0.53	0.07	48.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. AM_Lagoon-Union (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 112 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	44	0.0	44	0.0	0.715	51.2	LOS D	14.6	111.1	0.99	0.86	1.02	25.7
2	T1	All MCs	235	11.7	235	11.7	* 0.715	45.7	LOS D	14.6	111.1	0.99	0.86	1.02	23.7
3	R2	All MCs	138	26.7	138	26.7	0.150	16.8	LOS B	3.3	28.7	0.48	0.69	0.48	43.5
Approach			417	15.4	417	15.4	0.715	36.7	LOS C	14.6	111.1	0.82	0.80	0.84	30.2
East: Sydney Rd															
4	L2	All MCs	142	28.1	142	28.1	0.293	23.9	LOS B	6.8	57.4	0.73	0.73	0.73	37.1
5	T1	All MCs	217	6.3	217	6.3	0.293	34.1	LOS C	7.2	57.4	0.78	0.67	0.78	35.5
6	R2	All MCs	179	12.4	179	12.4	* 0.471	40.4	LOS C	8.1	62.6	0.86	0.80	0.86	27.8
Approach			538	14.1	538	14.1	0.471	33.5	LOS C	8.1	62.6	0.79	0.73	0.79	33.3
North: Union St															
7	L2	All MCs	140	9.8	140	9.8	* 0.667	43.0	LOS D	17.5	130.9	0.93	0.82	0.93	28.3
8	T1	All MCs	224	7.0	224	7.0	0.667	36.5	LOS C	17.5	130.9	0.93	0.82	0.93	26.3
9	R2	All MCs	209	13.1	209	13.1	0.406	39.1	LOS C	9.1	71.1	0.84	0.79	0.84	19.3
Approach			574	9.9	574	9.9	0.667	39.1	LOS C	17.5	130.9	0.90	0.81	0.90	24.5
West: Lagoon St															
10	L2	All MCs	71	13.4	71	13.4	0.061	12.0	LOS A	1.3	9.8	0.35	0.65	0.35	34.3
11	T1	All MCs	99	4.3	99	4.3	0.081	28.2	LOS B	1.9	13.5	0.73	0.56	0.73	36.5
12	R2	All MCs	25	4.2	25	4.2	0.094	40.9	LOS C	1.1	7.8	0.80	0.71	0.80	27.4
Approach			195	7.6	195	7.6	0.094	24.0	LOS B	1.9	13.5	0.60	0.61	0.60	34.4
All Vehicles			1723	12.3	1723	12.3	0.715	35.1	LOS C	17.5	130.9	0.81	0.76	0.82	29.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. AM_Sloane-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	38	0.0	38	0.0	0.043	5.5	LOS A	0.0	0.0	0.00	0.28	0.00	54.7
2	T1	All MCs	43	0.0	43	0.0	0.043	0.0	LOS A	0.0	0.0	0.00	0.28	0.00	57.2
Approach			81	0.0	81	0.0	0.043	2.6	NA	0.0	0.0	0.00	0.28	0.00	56.0
North: Sloane St															
8	T1	All MCs	13	0.0	13	0.0	0.045	0.3	LOS A	0.2	1.8	0.20	0.47	0.20	55.0
9	R2	All MCs	54	31.4	54	31.4	0.045	6.2	LOS A	0.2	1.8	0.20	0.47	0.20	51.6
Approach			66	25.4	66	25.4	0.045	5.0	NA	0.2	1.8	0.20	0.47	0.20	52.2
West: Garoorigang Rd															
10	L2	All MCs	23	18.2	23	18.2	0.032	5.9	LOS A	0.1	0.9	0.14	0.55	0.14	51.6
12	R2	All MCs	18	0.0	18	0.0	0.032	5.9	LOS A	0.1	0.9	0.14	0.55	0.14	51.5
Approach			41	10.3	41	10.3	0.032	5.9	LOS A	0.1	0.9	0.14	0.55	0.14	51.5
All Vehicles			188	11.2	188	11.2	0.045	4.2	NA	0.2	1.8	0.10	0.40	0.10	53.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. AM_Windellama-Rifle (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	222	8.1	222	8.1	0.125	0.0	LOS A	0.1	0.4	0.02	0.02	0.02	59.7
3	R2	All MCs	8	0.0	8	0.0	0.125	5.6	LOS A	0.1	0.4	0.02	0.02	0.02	56.9
Approach			231	7.8	231	7.8	0.125	0.2	NA	0.1	0.4	0.02	0.02	0.02	59.6
East: Rifle Range Rd															
4	L2	All MCs	2	0.0	2	0.0	0.012	5.8	LOS A	0.0	0.3	0.30	0.58	0.30	52.1
6	R2	All MCs	11	0.0	11	0.0	0.012	6.7	LOS A	0.0	0.3	0.30	0.58	0.30	51.8
Approach			13	0.0	13	0.0	0.012	6.5	LOS A	0.0	0.3	0.30	0.58	0.30	51.9
North: Windellama Rd															
7	L2	All MCs	2	0.0	2	0.0	0.052	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.3
8	T1	All MCs	92	11.5	92	11.5	0.052	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			94	11.2	94	11.2	0.052	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			337	8.4	337	8.4	0.125	0.4	NA	0.1	0.4	0.02	0.04	0.02	59.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 9 [9. AM_Windellama-Site Access (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: NA
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama - S															
2	T1	All MCs	211	5.5	211	5.5	0.112	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	99.7
3	R2	All MCs	1	0.0	1	0.0	0.112	5.5	LOS A	0.0	0.1	0.00	0.00	0.00	70.7
Approach			212	5.5	212	5.5	0.112	0.0	NA	0.0	0.1	0.00	0.00	0.00	99.5
East: Future Site Access															
4	L2	All MCs	1	0.0	1	0.0	0.026	5.7	LOS A	0.1	0.7	0.33	0.60	0.33	59.8
6	R2	All MCs	20	31.6	20	31.6	0.026	7.4	LOS A	0.1	0.7	0.33	0.60	0.33	52.5
Approach			21	30.0	21	30.0	0.026	7.4	LOS A	0.1	0.7	0.33	0.60	0.33	52.8
North: Windellama - N															
7	L2	All MCs	64	19.7	64	19.7	0.066	6.8	LOS A	0.0	0.0	0.00	0.35	0.00	57.6
8	T1	All MCs	49	8.5	49	8.5	0.066	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	67.9
Approach			114	14.8	114	14.8	0.066	3.9	NA	0.0	0.0	0.00	0.35	0.00	61.7
All Vehicles			346	10.0	346	10.0	0.112	1.7	NA	0.1	0.7	0.02	0.15	0.02	79.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. PM_Braidwood-Bungonia (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.069	5.9	LOS A	0.1	0.9	0.08	0.11	0.08	24.9
2	T1	All MCs	104	8.1	104	8.1	0.069	0.1	LOS A	0.1	0.9	0.08	0.11	0.08	56.9
3	R2	All MCs	18	5.9	18	5.9	0.069	5.9	LOS A	0.1	0.9	0.08	0.11	0.08	43.9
Approach			123	7.7	123	7.7	0.069	1.0	NA	0.1	0.9	0.08	0.11	0.08	55.3
East: Bungonia Rd															
4	L2	All MCs	14	7.7	14	7.7	0.010	4.5	LOS A	0.0	0.3	0.21	0.51	0.21	34.8
5	T1	All MCs	1	0.0	1	0.0	0.333	5.2	LOS A	1.5	11.4	0.51	0.75	0.58	30.5
6	R2	All MCs	227	11.1	227	11.1	0.333	7.5	LOS A	1.5	11.4	0.51	0.75	0.58	36.4
Approach			242	10.9	242	10.9	0.333	7.3	LOS A	1.5	11.4	0.49	0.74	0.56	36.3
North: Braidwood Rd															
7	L2	All MCs	215	11.8	215	11.8	0.214	5.8	LOS A	1.0	7.9	0.09	0.35	0.09	36.2
8	T1	All MCs	120	5.3	120	5.3	0.214	0.1	LOS A	1.0	7.9	0.09	0.35	0.09	51.2
9	R2	All MCs	6	33.3	6	33.3	0.214	6.3	LOS A	1.0	7.9	0.09	0.35	0.09	36.0
Approach			341	9.9	341	9.9	0.214	3.8	NA	1.0	7.9	0.09	0.35	0.09	40.9
West: Ottiwell St															
10	L2	All MCs	11	20.0	11	20.0	0.010	6.0	LOS A	0.0	0.3	0.22	0.53	0.22	38.8
11	T1	All MCs	1	0.0	1	0.0	0.010	5.1	LOS A	0.0	0.3	0.22	0.53	0.22	31.2
12	R2	All MCs	1	0.0	1	0.0	0.010	6.7	LOS A	0.0	0.3	0.22	0.53	0.22	35.6
Approach			13	16.7	13	16.7	0.010	6.0	LOS A	0.0	0.3	0.22	0.53	0.22	38.2
All Vehicles			719	10.0	719	10.0	0.333	4.5	NA	1.5	11.4	0.22	0.44	0.25	41.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. PM_Sloane-Braidwood (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	55	23.1	55	23.1	0.805	20.4	LOS B	8.1	62.3	0.87	1.44	2.33	28.2
5	T1	All MCs	56	3.8	56	3.8	0.805	25.5	LOS B	8.1	62.3	0.87	1.44	2.33	29.2
6	R2	All MCs	232	10.5	232	10.5	0.805	31.0	LOS C	8.1	62.3	0.87	1.44	2.33	28.9
Approach			342	11.4	342	11.4	0.805	28.4	LOS B	8.1	62.3	0.87	1.44	2.33	28.8
NorthEast: Sloane St															
7	L2	All MCs	218	8.2	218	8.2	0.280	6.3	LOS A	1.4	10.7	0.28	0.39	0.28	46.9
8	T1	All MCs	169	5.0	169	5.0	0.280	0.6	LOS A	1.4	10.7	0.28	0.39	0.28	50.9
9	R2	All MCs	41	5.1	41	5.1	0.280	6.8	LOS A	1.4	10.7	0.28	0.39	0.28	45.5
Approach			428	6.6	428	6.6	0.280	4.1	NA	1.4	10.7	0.28	0.39	0.28	48.1
NorthWest: Mundy St															
10	L2	All MCs	18	5.9	18	5.9	0.177	9.5	LOS A	0.6	4.9	0.54	1.00	0.54	38.6
11	T1	All MCs	78	13.5	78	13.5	0.177	12.8	LOS A	0.6	4.9	0.54	1.00	0.54	38.6
12	R2	All MCs	11	10.0	11	10.0	0.177	13.9	LOS A	0.6	4.9	0.54	1.00	0.54	37.3
Approach			106	11.9	106	11.9	0.177	12.4	LOS A	0.6	4.9	0.54	1.00	0.54	38.5
SouthWest: Sloane St															
1	L2	All MCs	14	0.0	14	0.0	0.176	6.2	LOS A	0.4	2.8	0.12	0.16	0.12	51.3
2	T1	All MCs	254	6.6	254	6.6	0.176	0.2	LOS A	0.4	2.8	0.12	0.16	0.12	56.7
3	R2	All MCs	43	14.6	43	14.6	0.176	6.4	LOS A	0.4	2.8	0.12	0.16	0.12	48.1
Approach			311	7.5	311	7.5	0.176	1.3	NA	0.4	2.8	0.12	0.16	0.12	54.9
All Vehicles			1187	8.7	1187	8.7	0.805	11.1	NA	8.1	62.3	0.43	0.69	0.85	40.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. PM_Bungonia-Forbes (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	175	12.0	175	12.0	0.106	0.1	LOS A	0.1	0.7	0.05	0.07	0.05	59.1
6	R2	All MCs	14	0.0	14	0.0	0.106	6.2	LOS A	0.1	0.7	0.05	0.07	0.05	55.7
Approach			188	11.2	188	11.2	0.106	0.5	NA	0.1	0.7	0.05	0.07	0.05	58.8
North: Forbes St															
7	L2	All MCs	18	0.0	18	0.0	0.015	8.6	LOS A	0.1	0.4	0.27	0.86	0.27	48.5
9	R2	All MCs	17	12.5	17	12.5	0.024	10.1	LOS A	0.1	0.6	0.41	0.90	0.41	49.7
Approach			35	6.1	35	6.1	0.024	9.4	LOS A	0.1	0.6	0.34	0.88	0.34	49.1
West: Bungonia Rd															
10	L2	All MCs	26	4.0	26	4.0	0.104	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	56.5
11	T1	All MCs	162	11.0	162	11.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.9
Approach			188	10.1	188	10.1	0.104	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.4
All Vehicles			412	10.2	412	10.2	0.106	1.4	NA	0.1	0.7	0.05	0.14	0.05	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. PM_Bungonia-Memorial (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	148	13.5	148	13.5	0.087	5.5	LOS A	0.0	0.1	0.00	0.59	0.00	46.3
3	R2	All MCs	2	50.0	2	50.0	0.087	6.1	LOS A	0.0	0.1	0.00	0.59	0.00	41.3
Approach			151	14.0	151	14.0	0.087	5.5	NA	0.0	0.1	0.00	0.59	0.00	46.2
East: Memorial Rd															
4	L2	All MCs	2	0.0	2	0.0	0.046	6.2	LOS A	0.1	1.1	0.36	0.62	0.36	47.8
6a	R1	All MCs	40	2.6	40	2.6	0.046	6.5	LOS A	0.1	1.1	0.36	0.62	0.36	45.3
Approach			42	2.5	42	2.5	0.046	6.5	LOS A	0.1	1.1	0.36	0.62	0.36	45.5
NorthWest: Bungonia Rd															
27a	L1	All MCs	12	0.0	12	0.0	0.119	5.3	LOS A	0.6	4.6	0.03	0.56	0.03	47.1
29a	R1	All MCs	189	12.8	189	12.8	0.119	5.1	LOS A	0.6	4.6	0.03	0.56	0.03	48.2
Approach			201	12.0	201	12.0	0.119	5.1	NA	0.6	4.6	0.03	0.56	0.03	48.2
All Vehicles			394	11.8	394	11.8	0.119	5.4	NA	0.6	4.6	0.05	0.58	0.05	47.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. PM_Hume-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	3	0.0	3	0.0	0.063	0.4	LOS A	0.3	2.2	0.24	0.55	0.24	54.5
6	R2	All MCs	94	10.1	94	10.1	0.063	6.0	LOS A	0.3	2.2	0.24	0.55	0.24	47.7
Approach			97	9.8	97	9.8	0.063	5.8	NA	0.3	2.2	0.24	0.55	0.24	48.0
North: Hume St															
7	L2	All MCs	82	15.4	82	15.4	0.069	5.9	LOS A	0.3	2.2	0.15	0.54	0.15	48.0
9	R2	All MCs	13	16.7	13	16.7	0.069	6.5	LOS A	0.3	2.2	0.15	0.54	0.15	47.5
Approach			95	15.6	95	15.6	0.069	6.0	LOS A	0.3	2.2	0.15	0.54	0.15	47.9
West: Mazamet Rd															
10	L2	All MCs	68	12.3	68	12.3	0.067	5.7	LOS A	0.0	0.0	0.00	0.33	0.00	51.4
11	T1	All MCs	53	0.0	53	0.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.33	0.00	57.2
Approach			121	7.0	121	7.0	0.067	3.2	NA	0.0	0.0	0.00	0.33	0.00	54.4
All Vehicles			313	10.4	313	10.4	0.069	4.9	NA	0.3	2.2	0.12	0.46	0.12	50.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. PM_Lagoon-Union (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 173 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	38	2.8	38	2.8	0.703	70.5	LOS E	24.7	179.8	0.96	0.83	0.96	22.3
2	T1	All MCs	293	4.7	293	4.7	* 0.703	64.9	LOS E	24.7	179.8	0.96	0.83	0.96	20.3
3	R2	All MCs	198	19.7	198	19.7	0.193	25.6	LOS B	6.8	55.9	0.45	0.70	0.45	41.9
Approach			528	10.2	528	10.2	0.703	50.6	LOS D	24.7	179.8	0.77	0.78	0.77	26.0
East: Sydney Rd															
4	L2	All MCs	154	15.8	154	15.8	0.264	33.8	LOS C	9.8	76.9	0.71	0.75	0.71	32.6
5	T1	All MCs	182	1.2	182	1.2	0.264	53.4	LOS D	9.9	76.9	0.78	0.67	0.78	29.1
6	R2	All MCs	185	6.3	185	6.3	* 0.586	64.2	LOS E	13.6	100.3	0.92	0.83	0.92	21.5
Approach			521	7.3	521	7.3	0.586	51.4	LOS D	13.6	100.3	0.81	0.75	0.81	27.3
North: Union St															
7	L2	All MCs	153	17.2	153	17.2	0.743	72.4	LOS F	27.8	211.5	0.96	0.85	0.96	22.2
8	T1	All MCs	216	5.4	216	5.4	* 0.743	66.8	LOS E	27.8	211.5	0.96	0.85	0.96	20.1
9	R2	All MCs	159	11.9	159	11.9	0.309	63.9	LOS E	10.2	78.9	0.82	0.78	0.82	15.4
Approach			527	10.8	527	10.8	0.743	67.6	LOS E	27.8	211.5	0.92	0.83	0.92	17.8
West: Lagoon St															
10	L2	All MCs	109	1.0	109	1.0	0.092	17.4	LOS B	3.3	23.6	0.40	0.67	0.40	30.0
11	T1	All MCs	189	2.8	189	2.8	0.162	48.3	LOS D	5.8	41.6	0.76	0.61	0.76	29.4
12	R2	All MCs	18	0.0	18	0.0	0.067	65.4	LOS E	1.2	8.1	0.80	0.71	0.80	22.3
Approach			317	2.0	317	2.0	0.162	38.6	LOS C	5.8	41.6	0.64	0.64	0.64	28.2
All Vehicles			1894	8.2	1894	8.2	0.743	53.5	LOS D	27.8	211.5	0.80	0.76	0.80	24.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. PM_Sloane-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	35	3.0	35	3.0	0.050	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	55.1
2	T1	All MCs	60	0.0	60	0.0	0.050	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.8
Approach			95	1.1	95	1.1	0.050	2.1	NA	0.0	0.0	0.00	0.22	0.00	56.8
North: Sloane St															
8	T1	All MCs	15	14.3	15	14.3	0.046	0.3	LOS A	0.2	1.6	0.20	0.46	0.20	54.7
9	R2	All MCs	59	10.7	59	10.7	0.046	5.9	LOS A	0.2	1.6	0.20	0.46	0.20	52.3
Approach			74	11.4	74	11.4	0.046	4.8	NA	0.2	1.6	0.20	0.46	0.20	52.7
West: Garoorigang Rd															
10	L2	All MCs	85	13.6	85	13.6	0.101	5.9	LOS A	0.4	3.0	0.17	0.55	0.17	51.7
12	R2	All MCs	47	0.0	47	0.0	0.101	6.0	LOS A	0.4	3.0	0.17	0.55	0.17	51.4
Approach			133	8.7	133	8.7	0.101	6.0	LOS A	0.4	3.0	0.17	0.55	0.17	51.6
All Vehicles			301	7.0	301	7.0	0.101	4.4	NA	0.4	3.0	0.13	0.43	0.13	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. PM_Windellama-Rifle (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	142	12.6	142	12.6	0.084	0.0	LOS A	0.0	0.4	0.03	0.03	0.03	59.7
3	R2	All MCs	5	40.0	5	40.0	0.084	6.6	LOS A	0.0	0.4	0.03	0.03	0.03	54.9
Approach			147	13.6	147	13.6	0.084	0.3	NA	0.0	0.4	0.03	0.03	0.03	59.5
East: Rifle Range Rd															
4	L2	All MCs	4	0.0	4	0.0	0.016	6.0	LOS A	0.1	0.4	0.32	0.59	0.32	52.0
6	R2	All MCs	11	20.0	11	20.0	0.016	7.2	LOS A	0.1	0.4	0.32	0.59	0.32	50.9
Approach			15	14.3	15	14.3	0.016	6.9	LOS A	0.1	0.4	0.32	0.59	0.32	51.2
North: Windellama Rd															
7	L2	All MCs	12	0.0	12	0.0	0.092	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.1
8	T1	All MCs	156	11.5	156	11.5	0.092	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.5
Approach			167	10.7	167	10.7	0.092	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles			329	12.1	329	12.1	0.092	0.6	NA	0.1	0.4	0.03	0.06	0.03	59.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 9 [9. PM_Windellama-Site Access (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: NA
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama - S															
2	T1	All MCs	103	13.3	103	13.3	0.058	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	99.3
3	R2	All MCs	1	0.0	1	0.0	0.058	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	70.5
Approach			104	13.1	104	13.1	0.058	0.1	NA	0.0	0.1	0.01	0.01	0.01	98.9
East: Future Site Access															
4	L2	All MCs	1	0.0	1	0.0	0.025	6.0	LOS A	0.1	0.7	0.33	0.61	0.33	59.9
6	R2	All MCs	20	31.6	20	31.6	0.025	7.3	LOS A	0.1	0.7	0.33	0.61	0.33	52.6
Approach			21	30.0	21	30.0	0.025	7.2	LOS A	0.1	0.7	0.33	0.61	0.33	53.0
North: Windellama - N															
7	L2	All MCs	40	31.6	40	31.6	0.102	8.0	LOS A	0.0	0.0	0.00	0.15	0.00	64.6
8	T1	All MCs	140	8.3	140	8.3	0.102	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	84.4
Approach			180	13.5	180	13.5	0.102	1.8	NA	0.0	0.0	0.00	0.15	0.00	79.0
All Vehicles			305	14.5	305	14.5	0.102	1.6	NA	0.1	0.7	0.03	0.13	0.03	81.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. SAT_Braidwood-Bungonia (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.057	5.9	LOS A	0.1	0.4	0.04	0.06	0.04	25.4
2	T1	All MCs	96	6.6	96	6.6	0.057	0.0	LOS A	0.1	0.4	0.04	0.06	0.04	58.4
3	R2	All MCs	7	14.3	7	14.3	0.057	6.0	LOS A	0.1	0.4	0.04	0.06	0.04	45.3
Approach			104	7.1	104	7.1	0.057	0.5	NA	0.1	0.4	0.04	0.06	0.04	57.4
East: Bungonia Rd															
4	L2	All MCs	5	20.0	5	20.0	0.004	4.5	LOS A	0.0	0.1	0.21	0.50	0.21	33.7
5	T1	All MCs	1	0.0	1	0.0	0.255	4.5	LOS A	1.0	7.1	0.44	0.68	0.44	32.5
6	R2	All MCs	193	6.6	193	6.6	0.255	6.3	LOS A	1.0	7.1	0.44	0.68	0.44	38.8
Approach			199	6.9	199	6.9	0.255	6.3	LOS A	1.0	7.1	0.44	0.68	0.44	38.7
North: Braidwood Rd															
7	L2	All MCs	188	9.5	188	9.5	0.186	5.7	LOS A	0.9	6.5	0.05	0.34	0.05	36.5
8	T1	All MCs	112	3.8	112	3.8	0.186	0.0	LOS A	0.9	6.5	0.05	0.34	0.05	51.6
9	R2	All MCs	3	0.0	3	0.0	0.186	5.6	LOS A	0.9	6.5	0.05	0.34	0.05	37.5
Approach			303	7.3	303	7.3	0.186	3.6	NA	0.9	6.5	0.05	0.34	0.05	41.4
West: Ottiwell St															
10	L2	All MCs	5	0.0	5	0.0	0.006	5.8	LOS A	0.0	0.1	0.21	0.53	0.21	42.8
11	T1	All MCs	1	0.0	1	0.0	0.006	4.9	LOS A	0.0	0.1	0.21	0.53	0.21	31.3
12	R2	All MCs	1	0.0	1	0.0	0.006	6.5	LOS A	0.0	0.1	0.21	0.53	0.21	35.7
Approach			7	0.0	7	0.0	0.006	5.8	LOS A	0.0	0.1	0.21	0.53	0.21	40.8
All Vehicles			614	7.0	614	7.0	0.255	4.0	NA	1.0	7.1	0.18	0.41	0.18	42.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. SAT_Sloane-Braidwood (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	39	10.8	39	10.8	0.575	13.0	LOS A	3.6	27.2	0.72	1.15	1.24	34.7
5	T1	All MCs	51	4.2	51	4.2	0.575	16.8	LOS B	3.6	27.2	0.72	1.15	1.24	35.0
6	R2	All MCs	186	8.5	186	8.5	0.575	19.9	LOS B	3.6	27.2	0.72	1.15	1.24	34.7
Approach			276	8.0	276	8.0	0.575	18.4	LOS B	3.6	27.2	0.72	1.15	1.24	34.7
NorthEast: Sloane St															
7	L2	All MCs	203	7.3	203	7.3	0.281	6.1	LOS A	1.4	10.3	0.23	0.34	0.23	47.8
8	T1	All MCs	206	1.5	206	1.5	0.281	0.4	LOS A	1.4	10.3	0.23	0.34	0.23	51.8
9	R2	All MCs	44	0.0	44	0.0	0.281	6.2	LOS A	1.4	10.3	0.23	0.34	0.23	47.1
Approach			454	3.9	454	3.9	0.281	3.5	NA	1.4	10.3	0.23	0.34	0.23	49.4
NorthWest: Mundy St															
10	L2	All MCs	17	0.0	17	0.0	0.090	8.7	LOS A	0.3	2.3	0.45	0.93	0.45	40.7
11	T1	All MCs	45	4.7	45	4.7	0.090	11.1	LOS A	0.3	2.3	0.45	0.93	0.45	41.1
12	R2	All MCs	4	0.0	4	0.0	0.090	11.7	LOS A	0.3	2.3	0.45	0.93	0.45	39.8
Approach			66	3.2	66	3.2	0.090	10.5	LOS A	0.3	2.3	0.45	0.93	0.45	40.9
SouthWest: Sloane St															
1	L2	All MCs	4	0.0	4	0.0	0.131	6.3	LOS A	0.4	2.7	0.17	0.21	0.17	50.3
2	T1	All MCs	178	1.8	178	1.8	0.131	0.3	LOS A	0.4	2.7	0.17	0.21	0.17	55.5
3	R2	All MCs	53	2.0	53	2.0	0.131	6.2	LOS A	0.4	2.7	0.17	0.21	0.17	50.2
Approach			235	1.8	235	1.8	0.131	1.7	NA	0.4	2.7	0.17	0.21	0.17	54.0
All Vehicles			1031	4.5	1031	4.5	0.575	7.5	NA	3.6	27.2	0.36	0.57	0.50	44.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. SAT_Bungonia-Forbes (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	137	5.4	137	5.4	0.075	0.0	LOS A	0.0	0.2	0.01	0.02	0.01	59.7
6	R2	All MCs	3	0.0	3	0.0	0.075	5.7	LOS A	0.0	0.2	0.01	0.02	0.01	56.2
Approach			140	5.3	140	5.3	0.075	0.1	NA	0.0	0.2	0.01	0.02	0.01	59.7
North: Forbes St															
7	L2	All MCs	18	11.8	18	11.8	0.015	9.1	LOS A	0.1	0.5	0.25	0.88	0.25	47.0
9	R2	All MCs	24	0.0	24	0.0	0.028	8.8	LOS A	0.1	0.6	0.34	0.88	0.34	50.7
Approach			42	5.0	42	5.0	0.028	8.9	LOS A	0.1	0.6	0.30	0.88	0.30	49.3
West: Bungonia Rd															
10	L2	All MCs	18	5.9	18	5.9	0.083	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	56.6
11	T1	All MCs	135	7.8	135	7.8	0.083	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.1
Approach			153	7.6	153	7.6	0.083	0.7	NA	0.0	0.0	0.00	0.07	0.00	58.7
All Vehicles			335	6.3	335	6.3	0.083	1.5	NA	0.1	0.6	0.04	0.15	0.04	57.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. SAT_Bungonia-Memorial (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	148	6.4	148	6.4	0.082	5.4	LOS A	0.0	0.1	0.00	0.59	0.00	47.4
3	R2	All MCs	2	0.0	2	0.0	0.082	5.4	LOS A	0.0	0.1	0.00	0.59	0.00	48.6
Approach			151	6.3	151	6.3	0.082	5.4	NA	0.0	0.1	0.00	0.59	0.00	47.4
East: Memorial Rd															
4	L2	All MCs	2	0.0	2	0.0	0.008	6.0	LOS A	0.0	0.2	0.31	0.56	0.31	47.9
6a	R1	All MCs	6	0.0	6	0.0	0.008	6.1	LOS A	0.0	0.2	0.31	0.56	0.31	46.0
Approach			8	0.0	8	0.0	0.008	6.1	LOS A	0.0	0.2	0.31	0.56	0.31	46.5
NorthWest: Bungonia Rd															
27a	L1	All MCs	5	0.0	5	0.0	0.094	5.3	LOS A	0.5	3.5	0.02	0.56	0.02	47.1
29a	R1	All MCs	156	10.1	156	10.1	0.094	5.1	LOS A	0.5	3.5	0.02	0.56	0.02	48.4
Approach			161	9.8	161	9.8	0.094	5.1	NA	0.5	3.5	0.02	0.56	0.02	48.4
All Vehicles			320	7.9	320	7.9	0.094	5.3	NA	0.5	3.5	0.02	0.58	0.02	47.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. SAT_Hume-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	5	0.0	5	0.0	0.058	0.0	LOS A	0.3	1.9	0.07	0.55	0.07	55.1
6	R2	All MCs	96	3.3	96	3.3	0.058	5.5	LOS A	0.3	1.9	0.07	0.55	0.07	48.9
Approach			101	3.1	101	3.1	0.058	5.2	NA	0.3	1.9	0.07	0.55	0.07	49.4
North: Hume St															
7	L2	All MCs	87	2.4	87	2.4	0.056	5.6	LOS A	0.2	1.6	0.03	0.56	0.03	49.2
9	R2	All MCs	2	0.0	2	0.0	0.056	5.5	LOS A	0.2	1.6	0.03	0.56	0.03	49.0
Approach			89	2.4	89	2.4	0.056	5.6	LOS A	0.2	1.6	0.03	0.56	0.03	49.2
West: Mazamet Rd															
10	L2	All MCs	12	0.0	12	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.43	0.00	51.1
11	T1	All MCs	4	0.0	4	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.43	0.00	56.2
Approach			16	0.0	16	0.0	0.008	4.1	NA	0.0	0.0	0.00	0.43	0.00	52.8
All Vehicles			206	2.6	206	2.6	0.058	5.3	NA	0.3	1.9	0.05	0.54	0.05	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. SAT_Lagoon-Union (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 112 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	9	0.0	9	0.0	0.480	42.8	LOS D	11.4	81.0	0.89	0.75	0.89	28.8
2	T1	All MCs	238	1.8	238	1.8	* 0.480	37.2	LOS C	11.4	81.0	0.89	0.75	0.89	26.9
3	R2	All MCs	169	7.5	169	7.5	0.140	12.0	LOS A	3.1	23.3	0.37	0.67	0.37	47.0
Approach			417	4.0	417	4.0	0.480	27.1	LOS B	11.4	81.0	0.68	0.72	0.68	35.2
East: Sydney Rd															
4	L2	All MCs	158	7.3	158	7.3	0.253	18.6	LOS B	6.8	49.8	0.67	0.72	0.67	39.1
5	T1	All MCs	221	0.0	221	0.0	0.253	31.4	LOS C	6.8	49.8	0.73	0.63	0.73	37.5
6	R2	All MCs	135	3.1	135	3.1	* 0.328	35.6	LOS C	5.5	39.8	0.79	0.77	0.79	29.7
Approach			514	3.1	514	3.1	0.328	28.6	LOS C	6.8	49.8	0.73	0.70	0.73	36.0
North: Union St															
7	L2	All MCs	168	5.6	168	5.6	0.933	72.2	LOS F	23.8	171.3	1.00	1.12	1.37	20.5
8	T1	All MCs	188	1.1	188	1.1	* 0.933	66.7	LOS E	23.8	171.3	1.00	1.12	1.37	18.3
9	R2	All MCs	140	0.8	140	0.8	0.369	47.3	LOS D	6.7	46.9	0.91	0.79	0.91	17.5
Approach			497	2.5	497	2.5	0.933	63.1	LOS E	23.8	171.3	0.97	1.03	1.24	19.0
West: Lagoon St															
10	L2	All MCs	88	0.0	88	0.0	0.076	14.2	LOS A	1.9	13.0	0.42	0.67	0.42	32.7
11	T1	All MCs	179	1.2	179	1.2	0.126	25.1	LOS B	3.2	22.7	0.70	0.56	0.70	38.1
12	R2	All MCs	12	0.0	12	0.0	0.036	35.2	LOS C	0.4	3.1	0.73	0.68	0.73	29.6
Approach			279	0.8	279	0.8	0.126	22.1	LOS B	3.2	22.7	0.61	0.60	0.61	36.6
All Vehicles			1706	2.8	1706	2.8	0.933	37.2	LOS C	23.8	171.3	0.77	0.78	0.84	29.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. SAT_Sloane-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	40	0.0	40	0.0	0.036	5.5	LOS A	0.0	0.0	0.00	0.35	0.00	54.1
2	T1	All MCs	27	3.8	27	3.8	0.036	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	56.4
Approach			67	1.6	67	1.6	0.036	3.3	NA	0.0	0.0	0.00	0.35	0.00	55.0
North: Sloane St															
8	T1	All MCs	23	0.0	23	0.0	0.049	0.2	LOS A	0.2	1.6	0.16	0.42	0.16	55.3
9	R2	All MCs	60	5.3	60	5.3	0.049	5.7	LOS A	0.2	1.6	0.16	0.42	0.16	53.0
Approach			83	3.8	83	3.8	0.049	4.2	NA	0.2	1.6	0.16	0.42	0.16	53.6
West: Garoorigang Rd															
10	L2	All MCs	26	8.0	26	8.0	0.070	5.7	LOS A	0.2	1.8	0.14	0.56	0.14	52.0
12	R2	All MCs	61	0.0	61	0.0	0.070	5.9	LOS A	0.2	1.8	0.14	0.56	0.14	51.5
Approach			87	2.4	87	2.4	0.070	5.9	LOS A	0.2	1.8	0.14	0.56	0.14	51.7
All Vehicles			238	2.7	238	2.7	0.070	4.5	NA	0.2	1.8	0.11	0.45	0.11	53.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. SAT_Windellama-Rifle (*) (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

Weekday PM Flows Used
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	131	13.7	131	13.7	0.078	0.1	LOS A	0.0	0.4	0.03	0.04	0.03	59.7
3	R2	All MCs	5	40.0	5	40.0	0.078	6.8	LOS A	0.0	0.4	0.03	0.04	0.03	54.9
Approach			136	14.7	136	14.7	0.078	0.3	NA	0.0	0.4	0.03	0.04	0.03	59.5
East: Rifle Range Rd															
4	L2	All MCs	4	0.0	4	0.0	0.016	6.0	LOS A	0.1	0.4	0.33	0.59	0.33	52.0
6	R2	All MCs	11	20.0	11	20.0	0.016	7.2	LOS A	0.1	0.4	0.33	0.59	0.33	50.8
Approach			15	14.3	15	14.3	0.016	6.9	LOS A	0.1	0.4	0.33	0.59	0.33	51.2
North: Windellama Rd															
7	L2	All MCs	12	0.0	12	0.0	0.099	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.1
8	T1	All MCs	168	10.6	168	10.6	0.099	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.6
Approach			180	9.9	180	9.9	0.099	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles			331	12.1	331	12.1	0.099	0.6	NA	0.1	0.4	0.03	0.06	0.03	59.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 9 [9. SAT_Windellama-Site Access (Site Folder: 2027 Base + Gundary Traffic (Sydney Road Route))]

NA
Site Category: NA
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama - S															
2	T1	All MCs	103	13.3	103	13.3	0.058	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	99.3
3	R2	All MCs	1	0.0	1	0.0	0.058	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	70.5
Approach			104	13.1	104	13.1	0.058	0.1	NA	0.0	0.1	0.01	0.01	0.01	98.9
East: Future Site Access															
4	L2	All MCs	1	0.0	1	0.0	0.025	6.0	LOS A	0.1	0.7	0.33	0.61	0.33	59.9
6	R2	All MCs	20	31.6	20	31.6	0.025	7.3	LOS A	0.1	0.7	0.33	0.61	0.33	52.6
Approach			21	30.0	21	30.0	0.025	7.2	LOS A	0.1	0.7	0.33	0.61	0.33	53.0
North: Windellama - N															
7	L2	All MCs	40	31.6	40	31.6	0.102	8.0	LOS A	0.0	0.0	0.00	0.15	0.00	64.6
8	T1	All MCs	140	8.3	140	8.3	0.102	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	84.4
Approach			180	13.5	180	13.5	0.102	1.8	NA	0.0	0.0	0.00	0.15	0.00	79.0
All Vehicles			305	14.5	305	14.5	0.102	1.6	NA	0.1	0.7	0.03	0.13	0.03	81.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. AM_Braidwood-Bungonia (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.051	6.0	LOS A	0.0	0.4	0.04	0.07	0.04	25.3
2	T1	All MCs	79	20.0	79	20.0	0.051	0.0	LOS A	0.0	0.4	0.04	0.07	0.04	58.2
3	R2	All MCs	6	16.7	6	16.7	0.051	6.1	LOS A	0.0	0.4	0.04	0.07	0.04	44.9
Approach			86	19.5	86	19.5	0.051	0.6	NA	0.0	0.4	0.04	0.07	0.04	57.0
East: Bungonia Rd															
4	L2	All MCs	11	10.0	11	10.0	0.008	4.5	LOS A	0.0	0.2	0.22	0.51	0.22	34.5
5	T1	All MCs	1	0.0	1	0.0	0.261	4.4	LOS A	1.0	7.3	0.44	0.68	0.44	32.6
6	R2	All MCs	200	5.8	200	5.8	0.261	6.3	LOS A	1.0	7.3	0.44	0.68	0.44	39.0
Approach			212	6.0	212	6.0	0.261	6.2	LOS A	1.0	7.3	0.43	0.67	0.43	38.9
North: Braidwood Rd															
7	L2	All MCs	171	12.3	171	12.3	0.182	5.7	LOS A	0.8	6.5	0.05	0.32	0.05	36.6
8	T1	All MCs	119	13.3	119	13.3	0.182	0.0	LOS A	0.8	6.5	0.05	0.32	0.05	51.9
9	R2	All MCs	3	33.3	3	33.3	0.182	6.0	LOS A	0.8	6.5	0.05	0.32	0.05	36.3
Approach			293	12.9	293	12.9	0.182	3.4	NA	0.8	6.5	0.05	0.32	0.05	42.1
West: Ottiwell St															
10	L2	All MCs	6	0.0	6	0.0	0.006	5.8	LOS A	0.0	0.2	0.19	0.53	0.19	42.8
11	T1	All MCs	1	0.0	1	0.0	0.006	4.9	LOS A	0.0	0.2	0.19	0.53	0.19	31.4
12	R2	All MCs	1	0.0	1	0.0	0.006	6.5	LOS A	0.0	0.2	0.19	0.53	0.19	35.8
Approach			8	0.0	8	0.0	0.006	5.8	LOS A	0.0	0.2	0.19	0.53	0.19	41.1
All Vehicles			599	11.2	599	11.2	0.261	4.0	NA	1.0	7.3	0.18	0.41	0.18	42.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. AM_Sloane-Braidwood (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	43	14.6	43	14.6	0.542	12.3	LOS A	3.6	27.3	0.69	1.08	1.11	35.5
5	T1	All MCs	58	5.5	58	5.5	0.542	15.5	LOS B	3.6	27.3	0.69	1.08	1.11	36.1
6	R2	All MCs	188	8.9	188	8.9	0.542	18.3	LOS B	3.6	27.3	0.69	1.08	1.11	35.7
Approach			289	9.1	289	9.1	0.542	16.8	LOS B	3.6	27.3	0.69	1.08	1.11	35.8
NorthEast: Sloane St															
7	L2	All MCs	146	8.6	146	8.6	0.198	6.3	LOS A	0.9	6.9	0.27	0.37	0.27	47.2
8	T1	All MCs	137	8.5	137	8.5	0.198	0.5	LOS A	0.9	6.9	0.27	0.37	0.27	51.4
9	R2	All MCs	21	5.0	21	5.0	0.198	6.3	LOS A	0.9	6.9	0.27	0.37	0.27	45.9
Approach			304	8.3	304	8.3	0.198	3.7	NA	0.9	6.9	0.27	0.37	0.27	48.8
NorthWest: Mundy St															
10	L2	All MCs	14	0.0	14	0.0	0.108	8.8	LOS A	0.4	2.9	0.46	0.96	0.46	40.6
11	T1	All MCs	59	10.7	59	10.7	0.108	11.4	LOS A	0.4	2.9	0.46	0.96	0.46	40.1
12	R2	All MCs	4	0.0	4	0.0	0.108	11.4	LOS A	0.4	2.9	0.46	0.96	0.46	39.7
Approach			77	8.2	77	8.2	0.108	10.9	LOS A	0.4	2.9	0.46	0.96	0.46	40.1
SouthWest: Sloane St															
1	L2	All MCs	5	0.0	5	0.0	0.163	6.1	LOS A	0.6	4.8	0.20	0.26	0.20	49.5
2	T1	All MCs	177	8.3	177	8.3	0.163	0.3	LOS A	0.6	4.8	0.20	0.26	0.20	54.5
3	R2	All MCs	85	19.8	85	19.8	0.163	6.3	LOS A	0.6	4.8	0.20	0.26	0.20	45.6
Approach			267	11.8	267	11.8	0.163	2.3	NA	0.6	4.8	0.20	0.26	0.20	51.0
All Vehicles			938	9.5	938	9.5	0.542	8.0	NA	3.6	27.3	0.39	0.61	0.52	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. AM_Bungonia-Forbes (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	209	6.0	209	6.0	0.123	0.1	LOS A	0.1	0.9	0.05	0.06	0.05	59.2
6	R2	All MCs	17	6.3	17	6.3	0.123	6.1	LOS A	0.1	0.9	0.05	0.06	0.05	55.4
Approach			226	6.0	226	6.0	0.123	0.5	NA	0.1	0.9	0.05	0.06	0.05	58.9
North: Forbes St															
7	L2	All MCs	5	0.0	5	0.0	0.004	8.4	LOS A	0.0	0.1	0.22	0.86	0.22	48.5
9	R2	All MCs	18	0.0	18	0.0	0.022	9.2	LOS A	0.1	0.5	0.38	0.88	0.38	50.5
Approach			23	0.0	23	0.0	0.022	9.0	LOS A	0.1	0.5	0.35	0.88	0.35	50.1
West: Bungonia Rd															
10	L2	All MCs	17	0.0	17	0.0	0.072	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	56.8
11	T1	All MCs	114	13.0	114	13.0	0.072	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.9
Approach			131	11.3	131	11.3	0.072	0.7	NA	0.0	0.0	0.00	0.08	0.00	58.5
All Vehicles			380	7.5	380	7.5	0.123	1.1	NA	0.1	0.9	0.05	0.12	0.05	58.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. AM_Bungonia-Memorial (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	233	6.8	233	6.8	0.128	5.4	LOS A	0.0	0.0	0.00	0.59	0.00	47.4
3	R2	All MCs	1	0.0	1	0.0	0.128	5.4	LOS A	0.0	0.0	0.00	0.59	0.00	48.6
Approach			234	6.8	234	6.8	0.128	5.4	NA	0.0	0.0	0.00	0.59	0.00	47.4
East: Memorial Rd															
4	L2	All MCs	1	0.0	1	0.0	0.021	5.9	LOS A	0.1	0.6	0.37	0.61	0.37	47.4
6a	R1	All MCs	16	26.7	16	26.7	0.021	7.2	LOS A	0.1	0.6	0.37	0.61	0.37	41.2
Approach			17	25.0	17	25.0	0.021	7.1	LOS A	0.1	0.6	0.37	0.61	0.37	41.6
NorthWest: Bungonia Rd															
27a	L1	All MCs	6	0.0	6	0.0	0.071	5.3	LOS A	0.3	2.6	0.01	0.57	0.01	47.2
29a	R1	All MCs	114	13.0	114	13.0	0.071	5.1	LOS A	0.3	2.6	0.01	0.57	0.01	48.3
Approach			120	12.3	120	12.3	0.071	5.1	NA	0.3	2.6	0.01	0.57	0.01	48.2
All Vehicles			371	9.4	371	9.4	0.128	5.4	NA	0.3	2.6	0.02	0.59	0.02	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. AM_Hume-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	5	20.0	5	20.0	0.057	0.1	LOS A	0.3	2.2	0.10	0.54	0.10	55.0
6	R2	All MCs	86	19.5	86	19.5	0.057	5.8	LOS A	0.3	2.2	0.10	0.54	0.10	47.7
Approach			92	19.5	92	19.5	0.057	5.5	NA	0.3	2.2	0.10	0.54	0.10	48.3
North: Hume St															
7	L2	All MCs	75	18.3	75	18.3	0.058	5.8	LOS A	0.2	1.9	0.04	0.56	0.04	48.3
9	R2	All MCs	8	25.0	8	25.0	0.058	5.9	LOS A	0.2	1.9	0.04	0.56	0.04	47.5
Approach			83	19.0	83	19.0	0.058	5.8	LOS A	0.2	1.9	0.04	0.56	0.04	48.2
West: Mazamet Rd															
10	L2	All MCs	21	30.0	21	30.0	0.016	5.9	LOS A	0.0	0.0	0.00	0.48	0.00	48.5
11	T1	All MCs	4	25.0	4	25.0	0.016	0.0	LOS A	0.0	0.0	0.00	0.48	0.00	55.8
Approach			25	29.2	25	29.2	0.016	4.9	NA	0.0	0.0	0.00	0.48	0.00	50.1
All Vehicles			200	20.5	200	20.5	0.058	5.5	NA	0.3	2.2	0.06	0.54	0.06	48.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. AM_Lagoon-Union (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 112 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	44	0.0	44	0.0	0.715	51.2	LOS D	14.6	111.1	0.99	0.86	1.02	25.7
2	T1	All MCs	235	11.7	235	11.7	* 0.715	45.7	LOS D	14.6	111.1	0.99	0.86	1.02	23.7
3	R2	All MCs	118	25.9	118	25.9	0.128	16.7	LOS B	2.8	24.0	0.47	0.68	0.47	43.6
Approach			397	14.6	397	14.6	0.715	37.7	LOS C	14.6	111.1	0.83	0.81	0.86	29.6
East: Sydney Rd															
4	L2	All MCs	162	28.6	162	28.6	0.303	23.6	LOS B	7.1	60.4	0.71	0.74	0.71	37.7
5	T1	All MCs	217	6.3	217	6.3	0.303	33.5	LOS C	7.5	60.4	0.78	0.67	0.78	35.5
6	R2	All MCs	179	12.4	179	12.4	* 0.471	40.4	LOS C	8.1	62.6	0.86	0.80	0.86	27.8
Approach			558	14.7	558	14.7	0.471	32.9	LOS C	8.1	62.6	0.79	0.73	0.79	33.7
North: Union St															
7	L2	All MCs	140	9.8	140	9.8	* 0.667	43.0	LOS D	17.5	130.9	0.93	0.82	0.93	28.3
8	T1	All MCs	224	7.0	224	7.0	0.667	36.5	LOS C	17.5	130.9	0.93	0.82	0.93	26.3
9	R2	All MCs	209	13.1	209	13.1	0.406	39.1	LOS C	9.1	71.1	0.84	0.79	0.84	19.3
Approach			574	9.9	574	9.9	0.667	39.1	LOS C	17.5	130.9	0.90	0.81	0.90	24.5
West: Lagoon St															
10	L2	All MCs	71	13.4	71	13.4	0.061	12.0	LOS A	1.3	9.8	0.35	0.65	0.35	34.3
11	T1	All MCs	99	4.3	99	4.3	0.081	28.2	LOS B	1.9	13.5	0.73	0.56	0.73	36.5
12	R2	All MCs	25	4.2	25	4.2	0.098	41.8	LOS C	1.1	7.9	0.81	0.72	0.81	27.1
Approach			195	7.6	195	7.6	0.098	24.1	LOS B	1.9	13.5	0.60	0.61	0.60	34.4
All Vehicles			1723	12.3	1723	12.3	0.715	35.0	LOS C	17.5	130.9	0.81	0.76	0.82	29.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. AM_Sloane-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	38	0.0	38	0.0	0.043	5.5	LOS A	0.0	0.0	0.00	0.28	0.00	54.7
2	T1	All MCs	43	0.0	43	0.0	0.043	0.0	LOS A	0.0	0.0	0.00	0.28	0.00	57.2
Approach			81	0.0	81	0.0	0.043	2.6	NA	0.0	0.0	0.00	0.28	0.00	56.0
North: Sloane St															
8	T1	All MCs	13	0.0	13	0.0	0.045	0.3	LOS A	0.2	1.8	0.20	0.47	0.20	55.0
9	R2	All MCs	54	31.4	54	31.4	0.045	6.2	LOS A	0.2	1.8	0.20	0.47	0.20	51.6
Approach			66	25.4	66	25.4	0.045	5.0	NA	0.2	1.8	0.20	0.47	0.20	52.2
West: Garoorigang Rd															
10	L2	All MCs	63	26.7	63	26.7	0.061	6.0	LOS A	0.2	2.0	0.14	0.54	0.14	51.3
12	R2	All MCs	18	0.0	18	0.0	0.061	5.9	LOS A	0.2	2.0	0.14	0.54	0.14	51.5
Approach			81	20.8	81	20.8	0.061	6.0	LOS A	0.2	2.0	0.14	0.54	0.14	51.3
All Vehicles			228	14.7	228	14.7	0.061	4.5	NA	0.2	2.0	0.10	0.43	0.10	53.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. AM_Windellama-Rifle (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	202	5.7	202	5.7	0.113	0.0	LOS A	0.1	0.4	0.02	0.03	0.02	59.7
3	R2	All MCs	8	0.0	8	0.0	0.113	5.6	LOS A	0.1	0.4	0.02	0.03	0.02	56.9
Approach			211	5.5	211	5.5	0.113	0.2	NA	0.1	0.4	0.02	0.03	0.02	59.6
East: Rifle Range Rd															
4	L2	All MCs	2	0.0	2	0.0	0.012	5.9	LOS A	0.0	0.3	0.31	0.58	0.31	52.1
6	R2	All MCs	11	0.0	11	0.0	0.012	6.7	LOS A	0.0	0.3	0.31	0.58	0.31	51.8
Approach			13	0.0	13	0.0	0.012	6.5	LOS A	0.0	0.3	0.31	0.58	0.31	51.8
North: Windellama Rd															
7	L2	All MCs	2	0.0	2	0.0	0.064	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.4
8	T1	All MCs	112	15.1	112	15.1	0.064	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach			114	14.8	114	14.8	0.064	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			337	8.4	337	8.4	0.113	0.4	NA	0.1	0.4	0.03	0.04	0.03	59.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 9 [9. AM_Windellama-Site Access (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: NA
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama - S															
2	T1	All MCs	211	5.5	211	5.5	0.112	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	99.7
3	R2	All MCs	1	0.0	1	0.0	0.112	5.5	LOS A	0.0	0.1	0.00	0.00	0.00	70.7
Approach			212	5.5	212	5.5	0.112	0.0	NA	0.0	0.1	0.00	0.00	0.00	99.5
East: Future Site Access															
4	L2	All MCs	1	0.0	1	0.0	0.026	5.7	LOS A	0.1	0.7	0.33	0.60	0.33	59.8
6	R2	All MCs	20	31.6	20	31.6	0.026	7.4	LOS A	0.1	0.7	0.33	0.60	0.33	52.5
Approach			21	30.0	21	30.0	0.026	7.4	LOS A	0.1	0.7	0.33	0.60	0.33	52.8
North: Windellama - N															
7	L2	All MCs	64	19.7	64	19.7	0.066	6.8	LOS A	0.0	0.0	0.00	0.35	0.00	57.6
8	T1	All MCs	49	8.5	49	8.5	0.066	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	67.9
Approach			114	14.8	114	14.8	0.066	3.9	NA	0.0	0.0	0.00	0.35	0.00	61.7
All Vehicles			346	10.0	346	10.0	0.112	1.7	NA	0.1	0.7	0.02	0.15	0.02	79.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. PM_Braidwood-Bungonia (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.069	5.9	LOS A	0.1	0.9	0.08	0.11	0.08	24.9
2	T1	All MCs	104	8.1	104	8.1	0.069	0.1	LOS A	0.1	0.9	0.08	0.11	0.08	56.9
3	R2	All MCs	18	5.9	18	5.9	0.069	5.9	LOS A	0.1	0.9	0.08	0.11	0.08	43.9
Approach			123	7.7	123	7.7	0.069	1.0	NA	0.1	0.9	0.08	0.11	0.08	55.3
East: Bungonia Rd															
4	L2	All MCs	14	7.7	14	7.7	0.010	4.5	LOS A	0.0	0.3	0.21	0.51	0.21	34.8
5	T1	All MCs	1	0.0	1	0.0	0.365	5.6	LOS A	1.7	13.9	0.54	0.79	0.65	29.4
6	R2	All MCs	232	18.6	232	18.6	0.365	8.2	LOS A	1.7	13.9	0.54	0.79	0.65	34.3
Approach			246	17.9	246	17.9	0.365	8.0	LOS A	1.7	13.9	0.52	0.77	0.63	34.3
North: Braidwood Rd															
7	L2	All MCs	235	13.5	235	13.5	0.229	5.8	LOS A	1.1	8.7	0.09	0.36	0.09	36.1
8	T1	All MCs	120	5.3	120	5.3	0.229	0.1	LOS A	1.1	8.7	0.09	0.36	0.09	51.0
9	R2	All MCs	6	33.3	6	33.3	0.229	6.3	LOS A	1.1	8.7	0.09	0.36	0.09	35.9
Approach			361	11.1	361	11.1	0.229	3.9	NA	1.1	8.7	0.09	0.36	0.09	40.4
West: Ottiwell St															
10	L2	All MCs	11	20.0	11	20.0	0.010	6.0	LOS A	0.0	0.3	0.22	0.53	0.22	38.8
11	T1	All MCs	1	0.0	1	0.0	0.010	5.1	LOS A	0.0	0.3	0.22	0.53	0.22	31.2
12	R2	All MCs	1	0.0	1	0.0	0.010	6.7	LOS A	0.0	0.3	0.22	0.53	0.22	35.6
Approach			13	16.7	13	16.7	0.010	6.0	LOS A	0.0	0.3	0.22	0.53	0.22	38.2
All Vehicles			743	12.9	743	12.9	0.365	4.8	NA	1.7	13.9	0.23	0.46	0.27	40.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. PM_Sloane-Braidwood (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	62	32.2	62	32.2	0.896	30.0	LOS C	11.8	94.4	0.94	1.72	3.31	23.3
5	T1	All MCs	56	3.8	56	3.8	0.896	35.8	LOS C	11.8	94.4	0.94	1.72	3.31	24.4
6	R2	All MCs	228	15.2	228	15.2	0.896	43.5	LOS D	11.8	94.4	0.94	1.72	3.31	24.1
Approach			346	16.4	346	16.4	0.896	39.9	LOS C	11.8	94.4	0.94	1.72	3.31	24.0
NorthEast: Sloane St															
7	L2	All MCs	198	5.9	198	5.9	0.269	6.4	LOS A	1.4	10.0	0.32	0.41	0.32	47.2
8	T1	All MCs	169	5.0	169	5.0	0.269	0.7	LOS A	1.4	10.0	0.32	0.41	0.32	50.7
9	R2	All MCs	41	5.1	41	5.1	0.269	6.8	LOS A	1.4	10.0	0.32	0.41	0.32	45.3
Approach			408	5.4	408	5.4	0.269	4.1	NA	1.4	10.0	0.32	0.41	0.32	48.3
NorthWest: Mundy St															
10	L2	All MCs	18	5.9	18	5.9	0.189	9.6	LOS A	0.7	5.2	0.56	1.00	0.56	38.1
11	T1	All MCs	78	13.5	78	13.5	0.189	13.5	LOS A	0.7	5.2	0.56	1.00	0.56	38.2
12	R2	All MCs	11	10.0	11	10.0	0.189	14.8	LOS B	0.7	5.2	0.56	1.00	0.56	36.8
Approach			106	11.9	106	11.9	0.189	12.9	LOS A	0.7	5.2	0.56	1.00	0.56	38.0
SouthWest: Sloane St															
1	L2	All MCs	14	0.0	14	0.0	0.210	6.3	LOS A	0.7	5.5	0.19	0.24	0.19	50.1
2	T1	All MCs	254	6.6	254	6.6	0.210	0.3	LOS A	0.7	5.5	0.19	0.24	0.19	55.2
3	R2	All MCs	83	22.8	83	22.8	0.210	6.6	LOS A	0.7	5.5	0.19	0.24	0.19	45.4
Approach			351	10.2	351	10.2	0.210	2.0	NA	0.7	5.5	0.19	0.24	0.19	52.1
All Vehicles			1212	10.5	1212	10.5	0.896	14.5	NA	11.8	94.4	0.48	0.79	1.16	37.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. PM_Bungonia-Forbes (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	179	21.8	179	21.8	0.113	0.1	LOS A	0.1	0.8	0.05	0.07	0.05	59.0
6	R2	All MCs	14	0.0	14	0.0	0.113	6.3	LOS A	0.1	0.8	0.05	0.07	0.05	55.6
Approach			193	20.2	193	20.2	0.113	0.5	NA	0.1	0.8	0.05	0.07	0.05	58.8
North: Forbes St															
7	L2	All MCs	18	0.0	18	0.0	0.015	8.7	LOS A	0.1	0.4	0.29	0.85	0.29	48.4
9	R2	All MCs	17	12.5	17	12.5	0.025	10.4	LOS A	0.1	0.6	0.43	0.91	0.43	49.5
Approach			35	6.1	35	6.1	0.025	9.5	LOS A	0.1	0.6	0.36	0.88	0.36	49.0
West: Bungonia Rd															
10	L2	All MCs	26	4.0	26	4.0	0.116	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	56.6
11	T1	All MCs	182	13.3	182	13.3	0.116	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.9
Approach			208	12.1	208	12.1	0.116	0.7	NA	0.0	0.0	0.00	0.08	0.00	58.5
All Vehicles			436	15.2	436	15.2	0.116	1.3	NA	0.1	0.8	0.05	0.14	0.05	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. PM_Bungonia-Memorial (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	173	25.6	173	25.6	0.108	5.6	LOS A	0.0	0.1	0.00	0.60	0.00	44.6
3	R2	All MCs	2	50.0	2	50.0	0.108	6.1	LOS A	0.0	0.1	0.00	0.60	0.00	41.3
Approach			175	25.9	175	25.9	0.108	5.6	NA	0.0	0.1	0.00	0.60	0.00	44.5
East: Memorial Rd															
4	L2	All MCs	2	0.0	2	0.0	0.047	6.2	LOS A	0.2	1.1	0.38	0.63	0.38	47.6
6a	R1	All MCs	40	2.6	40	2.6	0.047	6.7	LOS A	0.2	1.1	0.38	0.63	0.38	45.1
Approach			42	2.5	42	2.5	0.047	6.6	LOS A	0.2	1.1	0.38	0.63	0.38	45.3
NorthWest: Bungonia Rd															
27a	L1	All MCs	12	0.0	12	0.0	0.119	5.3	LOS A	0.6	4.6	0.03	0.56	0.03	47.1
29a	R1	All MCs	189	12.8	189	12.8	0.119	5.1	LOS A	0.6	4.6	0.03	0.56	0.03	48.2
Approach			201	12.0	201	12.0	0.119	5.1	NA	0.6	4.6	0.03	0.56	0.03	48.2
All Vehicles			418	16.9	418	16.9	0.119	5.5	NA	0.6	4.6	0.05	0.58	0.05	46.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. PM_Hume-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	3	0.0	3	0.0	0.071	0.5	LOS A	0.3	2.6	0.25	0.55	0.25	54.5
6	R2	All MCs	101	16.7	101	16.7	0.071	6.1	LOS A	0.3	2.6	0.25	0.55	0.25	47.3
Approach			104	16.2	104	16.2	0.071	5.9	NA	0.3	2.6	0.25	0.55	0.25	47.6
North: Hume St															
7	L2	All MCs	122	20.7	122	20.7	0.099	6.0	LOS A	0.4	3.4	0.15	0.54	0.15	47.7
9	R2	All MCs	13	16.7	13	16.7	0.099	6.6	LOS A	0.4	3.4	0.15	0.54	0.15	47.5
Approach			135	20.3	135	20.3	0.099	6.0	LOS A	0.4	3.4	0.15	0.54	0.15	47.7
West: Mazamet Rd															
10	L2	All MCs	68	12.3	68	12.3	0.067	5.7	LOS A	0.0	0.0	0.00	0.33	0.00	51.4
11	T1	All MCs	53	0.0	53	0.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.33	0.00	57.2
Approach			121	7.0	121	7.0	0.067	3.2	NA	0.0	0.0	0.00	0.33	0.00	54.4
All Vehicles			360	14.6	360	14.6	0.099	5.1	NA	0.4	3.4	0.13	0.47	0.13	50.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. PM_Lagoon-Union (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 173 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	38	2.8	38	2.8	0.698	70.4	LOS E	24.7	179.5	0.95	0.83	0.95	22.3
2	T1	All MCs	293	4.7	293	4.7	* 0.698	64.8	LOS E	24.7	179.5	0.95	0.83	0.95	20.3
3	R2	All MCs	187	22.5	187	22.5	0.186	25.6	LOS B	6.4	53.8	0.45	0.69	0.45	41.9
Approach			518	11.0	518	11.0	0.698	51.0	LOS D	24.7	179.5	0.77	0.78	0.77	25.7
East: Sydney Rd															
4	L2	All MCs	174	17.6	174	17.6	0.272	33.2	LOS C	10.3	81.8	0.69	0.75	0.69	33.6
5	T1	All MCs	182	1.2	182	1.2	0.272	52.0	LOS D	10.3	81.8	0.79	0.67	0.79	29.1
6	R2	All MCs	185	6.3	185	6.3	* 0.586	64.2	LOS E	13.6	100.3	0.92	0.83	0.92	21.5
Approach			541	8.2	541	8.2	0.586	50.1	LOS D	13.6	100.3	0.80	0.75	0.80	27.7
North: Union St															
7	L2	All MCs	153	17.2	153	17.2	0.743	72.4	LOS F	27.8	211.5	0.96	0.85	0.96	22.2
8	T1	All MCs	216	5.4	216	5.4	* 0.743	66.8	LOS E	27.8	211.5	0.96	0.85	0.96	20.1
9	R2	All MCs	159	11.9	159	11.9	0.309	63.9	LOS E	10.2	78.9	0.82	0.78	0.82	15.4
Approach			527	10.8	527	10.8	0.743	67.6	LOS E	27.8	211.5	0.92	0.83	0.92	17.8
West: Lagoon St															
10	L2	All MCs	109	1.0	109	1.0	0.092	17.4	LOS B	3.3	23.6	0.40	0.67	0.40	30.0
11	T1	All MCs	189	2.8	189	2.8	0.162	48.3	LOS D	5.8	41.6	0.76	0.61	0.76	29.4
12	R2	All MCs	18	0.0	18	0.0	0.070	66.3	LOS E	1.2	8.2	0.81	0.71	0.81	22.1
Approach			317	2.0	317	2.0	0.162	38.6	LOS C	5.8	41.6	0.64	0.64	0.64	28.2
All Vehicles			1903	8.6	1903	8.6	0.743	53.3	LOS D	27.8	211.5	0.80	0.76	0.80	24.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. PM_Sloane-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	35	3.0	35	3.0	0.050	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	55.1
2	T1	All MCs	60	0.0	60	0.0	0.050	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	57.8
Approach			95	1.1	95	1.1	0.050	2.1	NA	0.0	0.0	0.00	0.22	0.00	56.8
North: Sloane St															
8	T1	All MCs	15	14.3	15	14.3	0.054	0.3	LOS A	0.2	2.0	0.21	0.47	0.21	54.7
9	R2	All MCs	66	20.6	66	20.6	0.054	6.0	LOS A	0.2	2.0	0.21	0.47	0.21	51.8
Approach			81	19.5	81	19.5	0.054	5.0	NA	0.2	2.0	0.21	0.47	0.21	52.3
West: Garoorigang Rd															
10	L2	All MCs	125	19.3	125	19.3	0.131	6.0	LOS A	0.5	4.2	0.17	0.55	0.17	51.5
12	R2	All MCs	47	0.0	47	0.0	0.131	6.1	LOS A	0.5	4.2	0.17	0.55	0.17	51.3
Approach			173	14.0	173	14.0	0.131	6.0	LOS A	0.5	4.2	0.17	0.55	0.17	51.4
All Vehicles			348	11.8	348	11.8	0.131	4.7	NA	0.5	4.2	0.14	0.44	0.14	52.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. PM_Windellama-Rifle (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	146	24.5	146	24.5	0.092	0.0	LOS A	0.0	0.4	0.03	0.04	0.03	59.7
3	R2	All MCs	5	40.0	5	40.0	0.092	6.8	LOS A	0.0	0.4	0.03	0.04	0.03	54.9
Approach			152	25.0	152	25.0	0.092	0.3	NA	0.0	0.4	0.03	0.04	0.03	59.5
East: Rifle Range Rd															
4	L2	All MCs	4	0.0	4	0.0	0.016	6.1	LOS A	0.1	0.4	0.34	0.59	0.34	51.9
6	R2	All MCs	11	20.0	11	20.0	0.016	7.4	LOS A	0.1	0.4	0.34	0.59	0.34	50.8
Approach			15	14.3	15	14.3	0.016	7.0	LOS A	0.1	0.4	0.34	0.59	0.34	51.1
North: Windellama Rd															
7	L2	All MCs	12	0.0	12	0.0	0.104	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.1
8	T1	All MCs	176	13.8	176	13.8	0.104	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.6
Approach			187	12.9	187	12.9	0.104	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles			354	18.2	354	18.2	0.104	0.6	NA	0.1	0.4	0.03	0.06	0.03	59.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 9 [9. PM_Windellama-Site Access (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: NA
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama - S															
2	T1	All MCs	103	13.3	103	13.3	0.058	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	99.3
3	R2	All MCs	1	0.0	1	0.0	0.058	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	70.5
Approach			104	13.1	104	13.1	0.058	0.1	NA	0.0	0.1	0.01	0.01	0.01	98.9
East: Future Site Access															
4	L2	All MCs	1	0.0	1	0.0	0.025	6.0	LOS A	0.1	0.7	0.33	0.61	0.33	59.9
6	R2	All MCs	20	31.6	20	31.6	0.025	7.3	LOS A	0.1	0.7	0.33	0.61	0.33	52.6
Approach			21	30.0	21	30.0	0.025	7.2	LOS A	0.1	0.7	0.33	0.61	0.33	53.0
North: Windellama - N															
7	L2	All MCs	40	31.6	40	31.6	0.102	8.0	LOS A	0.0	0.0	0.00	0.15	0.00	64.6
8	T1	All MCs	140	8.3	140	8.3	0.102	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	84.4
Approach			180	13.5	180	13.5	0.102	1.8	NA	0.0	0.0	0.00	0.15	0.00	79.0
All Vehicles			305	14.5	305	14.5	0.102	1.6	NA	0.1	0.7	0.03	0.13	0.03	81.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 1 [1. SAT_Braidwood-Bungonia (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Braidwood Rd															
1	L2	All MCs	1	0.0	1	0.0	0.057	5.9	LOS A	0.1	0.4	0.04	0.06	0.04	25.4
2	T1	All MCs	96	6.6	96	6.6	0.057	0.0	LOS A	0.1	0.4	0.04	0.06	0.04	58.4
3	R2	All MCs	7	14.3	7	14.3	0.057	6.0	LOS A	0.1	0.4	0.04	0.06	0.04	45.3
Approach			104	7.1	104	7.1	0.057	0.5	NA	0.1	0.4	0.04	0.06	0.04	57.4
East: Bungonia Rd															
4	L2	All MCs	5	20.0	5	20.0	0.004	4.5	LOS A	0.0	0.1	0.21	0.50	0.21	33.7
5	T1	All MCs	1	0.0	1	0.0	0.294	4.7	LOS A	1.2	9.4	0.47	0.70	0.49	31.6
6	R2	All MCs	208	14.6	208	14.6	0.294	6.8	LOS A	1.2	9.4	0.47	0.70	0.49	36.6
Approach			215	14.7	215	14.7	0.294	6.7	LOS A	1.2	9.4	0.46	0.70	0.48	36.5
North: Braidwood Rd															
7	L2	All MCs	196	12.4	196	12.4	0.193	5.8	LOS A	0.9	6.9	0.05	0.35	0.05	36.5
8	T1	All MCs	112	3.8	112	3.8	0.193	0.0	LOS A	0.9	6.9	0.05	0.35	0.05	51.6
9	R2	All MCs	3	0.0	3	0.0	0.193	5.6	LOS A	0.9	6.9	0.05	0.35	0.05	37.5
Approach			311	9.2	311	9.2	0.193	3.7	NA	0.9	6.9	0.05	0.35	0.05	41.3
West: Ottiwell St															
10	L2	All MCs	5	0.0	5	0.0	0.006	5.8	LOS A	0.0	0.1	0.21	0.53	0.21	42.8
11	T1	All MCs	1	0.0	1	0.0	0.006	4.9	LOS A	0.0	0.1	0.21	0.53	0.21	31.3
12	R2	All MCs	1	0.0	1	0.0	0.006	6.5	LOS A	0.0	0.1	0.21	0.53	0.21	35.7
Approach			7	0.0	7	0.0	0.006	5.8	LOS A	0.0	0.1	0.21	0.53	0.21	40.8
All Vehicles			637	10.6	637	10.6	0.294	4.2	NA	1.2	9.4	0.19	0.42	0.20	41.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 2 [2. SAT_Sloane-Braidwood (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Braidwood Rd															
4	L2	All MCs	49	23.4	49	23.4	0.649	15.1	LOS B	4.6	36.1	0.77	1.21	1.49	32.1
5	T1	All MCs	51	4.2	51	4.2	0.649	18.8	LOS B	4.6	36.1	0.77	1.21	1.49	33.3
6	R2	All MCs	192	13.7	192	13.7	0.649	23.4	LOS B	4.6	36.1	0.77	1.21	1.49	32.6
Approach			292	13.7	292	13.7	0.649	21.2	LOS B	4.6	36.1	0.77	1.21	1.49	32.6
NorthEast: Sloane St															
7	L2	All MCs	179	4.7	179	4.7	0.266	6.2	LOS A	1.3	9.4	0.26	0.35	0.26	48.3
8	T1	All MCs	206	1.5	206	1.5	0.266	0.5	LOS A	1.3	9.4	0.26	0.35	0.26	51.8
9	R2	All MCs	44	0.0	44	0.0	0.266	6.2	LOS A	1.3	9.4	0.26	0.35	0.26	47.1
Approach			429	2.7	429	2.7	0.266	3.5	NA	1.3	9.4	0.26	0.35	0.26	49.7
NorthWest: Mundy St															
10	L2	All MCs	17	0.0	17	0.0	0.094	8.7	LOS A	0.3	2.4	0.47	0.94	0.47	40.4
11	T1	All MCs	45	4.7	45	4.7	0.094	11.5	LOS A	0.3	2.4	0.47	0.94	0.47	40.8
12	R2	All MCs	4	0.0	4	0.0	0.094	12.1	LOS A	0.3	2.4	0.47	0.94	0.47	39.5
Approach			66	3.2	66	3.2	0.094	10.8	LOS A	0.3	2.4	0.47	0.94	0.47	40.7
SouthWest: Sloane St															
1	L2	All MCs	4	0.0	4	0.0	0.162	6.4	LOS A	0.6	4.7	0.24	0.29	0.24	49.3
2	T1	All MCs	178	1.8	178	1.8	0.162	0.5	LOS A	0.6	4.7	0.24	0.29	0.24	54.2
3	R2	All MCs	84	16.3	84	16.3	0.162	6.5	LOS A	0.6	4.7	0.24	0.29	0.24	46.1
Approach			266	6.3	266	6.3	0.162	2.5	NA	0.6	4.7	0.24	0.29	0.24	51.1
All Vehicles			1054	6.7	1054	6.7	0.649	8.6	NA	4.6	36.1	0.41	0.61	0.61	42.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 3 [3. SAT_Bungonia-Forbes (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Bungonia Rd															
5	T1	All MCs	153	16.6	153	16.6	0.089	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.7
6	R2	All MCs	3	0.0	3	0.0	0.089	5.7	LOS A	0.0	0.2	0.01	0.01	0.01	56.3
Approach			156	16.2	156	16.2	0.089	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.7
North: Forbes St															
7	L2	All MCs	18	11.8	18	11.8	0.015	9.1	LOS A	0.1	0.5	0.26	0.87	0.26	47.0
9	R2	All MCs	24	0.0	24	0.0	0.029	9.0	LOS A	0.1	0.6	0.36	0.88	0.36	50.6
Approach			42	5.0	42	5.0	0.029	9.0	LOS A	0.1	0.6	0.32	0.88	0.32	49.3
West: Bungonia Rd															
10	L2	All MCs	18	5.9	18	5.9	0.089	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	56.6
11	T1	All MCs	142	11.9	142	11.9	0.089	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.1
Approach			160	11.2	160	11.2	0.089	0.6	NA	0.0	0.0	0.00	0.07	0.00	58.7
All Vehicles			358	12.6	358	12.6	0.089	1.4	NA	0.1	0.6	0.04	0.14	0.04	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 4 [4. SAT_Bungonia-Memorial (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bungonia Rd															
1a	L1	All MCs	184	18.3	184	18.3	0.110	5.5	LOS A	0.0	0.1	0.00	0.60	0.00	45.6
3	R2	All MCs	2	0.0	2	0.0	0.110	5.4	LOS A	0.0	0.1	0.00	0.60	0.00	48.6
Approach			186	18.1	186	18.1	0.110	5.5	NA	0.0	0.1	0.00	0.60	0.00	45.6
East: Memorial Rd															
4	L2	All MCs	2	0.0	2	0.0	0.008	6.0	LOS A	0.0	0.2	0.32	0.56	0.32	47.9
6a	R1	All MCs	6	0.0	6	0.0	0.008	6.2	LOS A	0.0	0.2	0.32	0.56	0.32	45.9
Approach			8	0.0	8	0.0	0.008	6.2	LOS A	0.0	0.2	0.32	0.56	0.32	46.5
NorthWest: Bungonia Rd															
27a	L1	All MCs	5	0.0	5	0.0	0.087	5.3	LOS A	0.4	3.2	0.02	0.56	0.02	47.1
29a	R1	All MCs	143	11.0	143	11.0	0.087	5.1	LOS A	0.4	3.2	0.02	0.56	0.02	48.3
Approach			148	10.6	148	10.6	0.087	5.1	NA	0.4	3.2	0.02	0.56	0.02	48.3
All Vehicles			343	14.4	343	14.4	0.110	5.4	NA	0.4	3.2	0.02	0.58	0.02	46.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 5 [5. SAT_Hume-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Garoorigang Rd															
5	T1	All MCs	5	0.0	5	0.0	0.066	0.0	LOS A	0.3	2.4	0.07	0.55	0.07	55.1
6	R2	All MCs	106	9.9	106	9.9	0.066	5.6	LOS A	0.3	2.4	0.07	0.55	0.07	48.4
Approach			112	9.4	112	9.4	0.066	5.3	NA	0.3	2.4	0.07	0.55	0.07	48.9
North: Hume St															
7	L2	All MCs	123	12.0	123	12.0	0.082	5.7	LOS A	0.3	2.7	0.03	0.56	0.03	48.7
9	R2	All MCs	2	0.0	2	0.0	0.082	5.6	LOS A	0.3	2.7	0.03	0.56	0.03	49.0
Approach			125	11.8	125	11.8	0.082	5.7	LOS A	0.3	2.7	0.03	0.56	0.03	48.7
West: Mazamet Rd															
10	L2	All MCs	12	0.0	12	0.0	0.008	5.5	LOS A	0.0	0.0	0.00	0.43	0.00	51.1
11	T1	All MCs	4	0.0	4	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.43	0.00	56.2
Approach			16	0.0	16	0.0	0.008	4.1	NA	0.0	0.0	0.00	0.43	0.00	52.8
All Vehicles			253	10.0	253	10.0	0.082	5.4	NA	0.3	2.7	0.05	0.55	0.05	49.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 6.1512 [6. SAT_Lagoon-Union (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 112 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: 0815-0915
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Union St															
1	L2	All MCs	9	0.0	9	0.0	0.480	42.8	LOS D	11.4	81.0	0.89	0.75	0.89	28.8
2	T1	All MCs	238	1.8	238	1.8	* 0.480	37.2	LOS C	11.4	81.0	0.89	0.75	0.89	26.9
3	R2	All MCs	163	9.7	163	9.7	0.137	12.0	LOS A	3.0	22.8	0.37	0.67	0.37	47.0
Approach			411	4.9	411	4.9	0.480	27.4	LOS B	11.4	81.0	0.68	0.72	0.68	35.0
East: Sydney Rd															
4	L2	All MCs	173	10.4	173	10.4	0.261	18.8	LOS B	6.9	52.2	0.66	0.72	0.66	39.5
5	T1	All MCs	221	0.0	221	0.0	0.261	30.9	LOS C	7.1	52.2	0.73	0.63	0.73	37.5
6	R2	All MCs	135	3.1	135	3.1	* 0.328	35.6	LOS C	5.5	39.8	0.79	0.77	0.79	29.7
Approach			528	4.2	528	4.2	0.328	28.2	LOS B	7.1	52.2	0.72	0.70	0.72	36.2
North: Union St															
7	L2	All MCs	168	5.6	168	5.6	0.933	72.2	LOS F	23.8	171.3	1.00	1.12	1.37	20.5
8	T1	All MCs	188	1.1	188	1.1	* 0.933	66.7	LOS E	23.8	171.3	1.00	1.12	1.37	18.3
9	R2	All MCs	140	0.8	140	0.8	0.369	47.3	LOS D	6.7	46.9	0.91	0.79	0.91	17.5
Approach			497	2.5	497	2.5	0.933	63.1	LOS E	23.8	171.3	0.97	1.03	1.24	19.0
West: Lagoon St															
10	L2	All MCs	88	0.0	88	0.0	0.076	14.2	LOS A	1.9	13.0	0.42	0.67	0.42	32.7
11	T1	All MCs	179	1.2	179	1.2	0.126	25.1	LOS B	3.2	22.7	0.70	0.56	0.70	38.1
12	R2	All MCs	12	0.0	12	0.0	0.036	36.0	LOS C	0.5	3.2	0.74	0.68	0.74	29.3
Approach			279	0.8	279	0.8	0.126	22.1	LOS B	3.2	22.7	0.61	0.60	0.61	36.6
All Vehicles			1715	3.3	1715	3.3	0.933	37.1	LOS C	23.8	171.3	0.77	0.78	0.84	29.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Site: 7 [7. SAT_Sloane-Garoorigang (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Garoorigang St															
1	L2	All MCs	40	0.0	40	0.0	0.036	5.5	LOS A	0.0	0.0	0.00	0.35	0.00	54.1
2	T1	All MCs	27	3.8	27	3.8	0.036	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	56.4
Approach			67	1.6	67	1.6	0.036	3.3	NA	0.0	0.0	0.00	0.35	0.00	55.0
North: Sloane St															
8	T1	All MCs	23	0.0	23	0.0	0.058	0.2	LOS A	0.3	2.1	0.17	0.44	0.17	55.2
9	R2	All MCs	71	14.9	71	14.9	0.058	5.9	LOS A	0.3	2.1	0.17	0.44	0.17	52.5
Approach			94	11.2	94	11.2	0.058	4.5	NA	0.3	2.1	0.17	0.44	0.17	53.1
West: Garoorigang Rd															
10	L2	All MCs	62	23.7	62	23.7	0.097	5.9	LOS A	0.4	2.8	0.13	0.55	0.13	51.4
12	R2	All MCs	61	0.0	61	0.0	0.097	6.0	LOS A	0.4	2.8	0.13	0.55	0.13	51.5
Approach			123	12.0	123	12.0	0.097	6.0	LOS A	0.4	2.8	0.13	0.55	0.13	51.5
All Vehicles			284	9.3	284	9.3	0.097	4.8	NA	0.4	2.8	0.11	0.47	0.11	52.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 8 [8. SAT_Windellama-Rifle (*) (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

Weekday PM Flows Used
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama Rd															
2	T1	All MCs	146	24.5	146	24.5	0.092	0.0	LOS A	0.0	0.4	0.03	0.04	0.03	59.7
3	R2	All MCs	5	40.0	5	40.0	0.092	6.8	LOS A	0.0	0.4	0.03	0.04	0.03	54.9
Approach			152	25.0	152	25.0	0.092	0.3	NA	0.0	0.4	0.03	0.04	0.03	59.5
East: Rifle Range Rd															
4	L2	All MCs	4	0.0	4	0.0	0.016	6.1	LOS A	0.1	0.4	0.34	0.59	0.34	51.9
6	R2	All MCs	11	20.0	11	20.0	0.016	7.4	LOS A	0.1	0.4	0.34	0.59	0.34	50.8
Approach			15	14.3	15	14.3	0.016	7.0	LOS A	0.1	0.4	0.34	0.59	0.34	51.1
North: Windellama Rd															
7	L2	All MCs	12	0.0	12	0.0	0.104	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.1
8	T1	All MCs	176	13.8	176	13.8	0.104	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.6
Approach			187	12.9	187	12.9	0.104	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles			354	18.2	354	18.2	0.104	0.6	NA	0.1	0.4	0.03	0.06	0.03	59.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Site: 9 [9. SAT_Windellama-Site Access (Site Folder: 2027 Base + Gundary Traffic (Hume Street Route))]

NA
Site Category: NA
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Windellama - S															
2	T1	All MCs	103	13.3	103	13.3	0.058	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	99.3
3	R2	All MCs	1	0.0	1	0.0	0.058	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	70.5
Approach			104	13.1	104	13.1	0.058	0.1	NA	0.0	0.1	0.01	0.01	0.01	98.9
East: Future Site Access															
4	L2	All MCs	1	0.0	1	0.0	0.025	6.0	LOS A	0.1	0.7	0.33	0.61	0.33	59.9
6	R2	All MCs	20	31.6	20	31.6	0.025	7.3	LOS A	0.1	0.7	0.33	0.61	0.33	52.6
Approach			21	30.0	21	30.0	0.025	7.2	LOS A	0.1	0.7	0.33	0.61	0.33	53.0
North: Windellama - N															
7	L2	All MCs	40	31.6	40	31.6	0.102	8.0	LOS A	0.0	0.0	0.00	0.15	0.00	64.6
8	T1	All MCs	140	8.3	140	8.3	0.102	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	84.4
Approach			180	13.5	180	13.5	0.102	1.8	NA	0.0	0.0	0.00	0.15	0.00	79.0
All Vehicles			305	14.5	305	14.5	0.102	1.6	NA	0.1	0.7	0.03	0.13	0.03	81.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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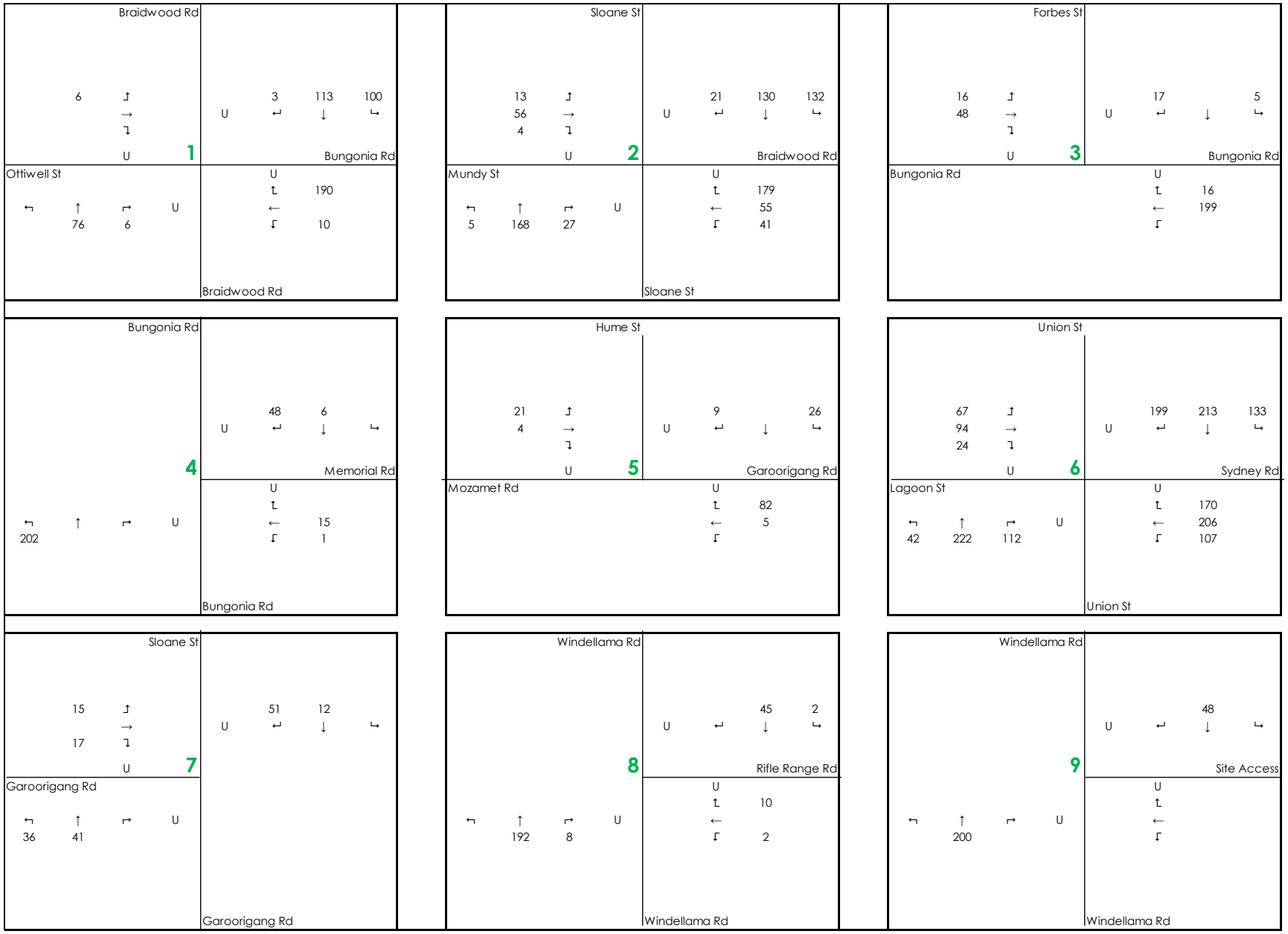
Appendix C

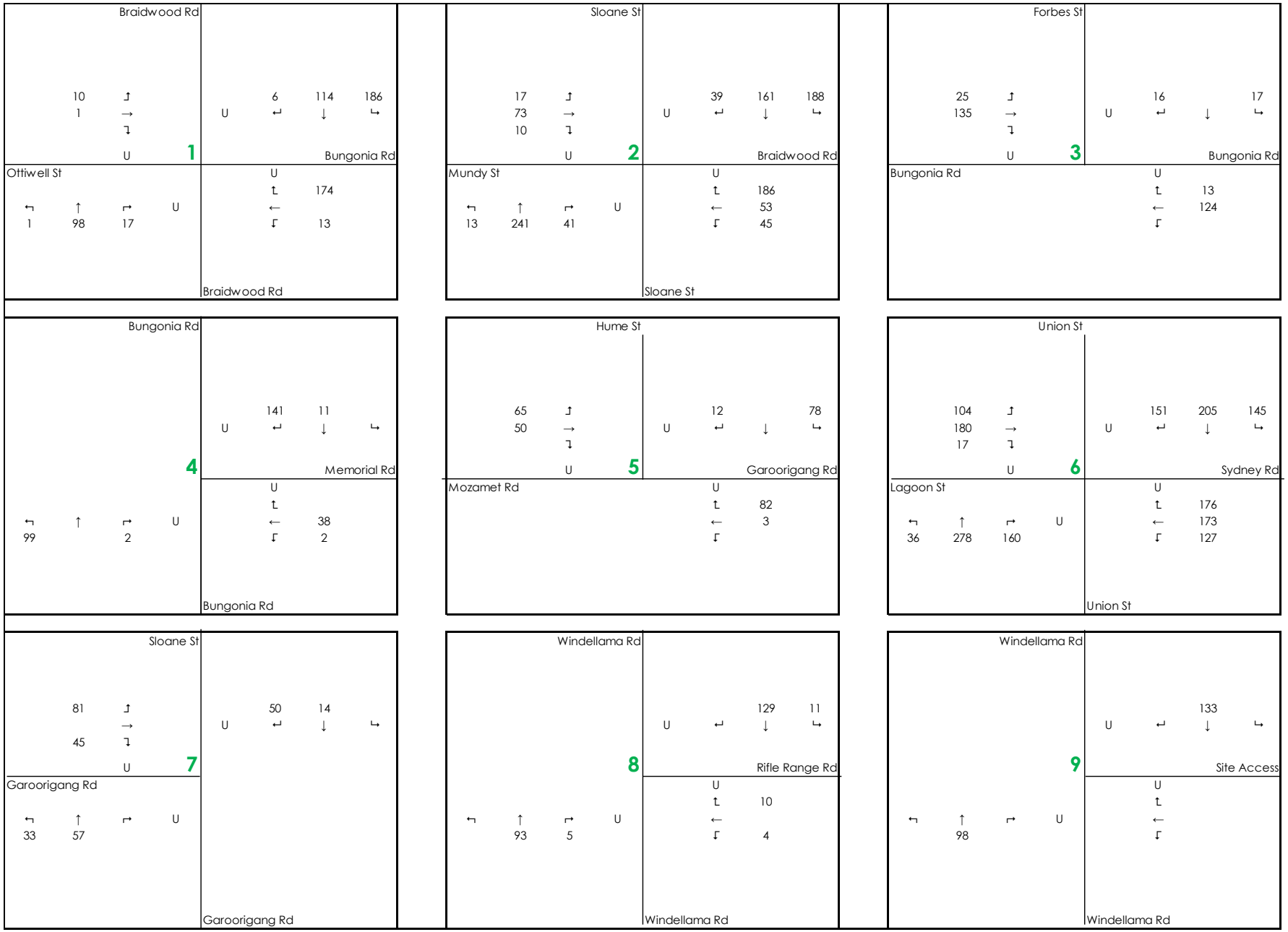
Project Related Traffic Distribution

2027 – Intersection Locations (as modelled in SIDRA)

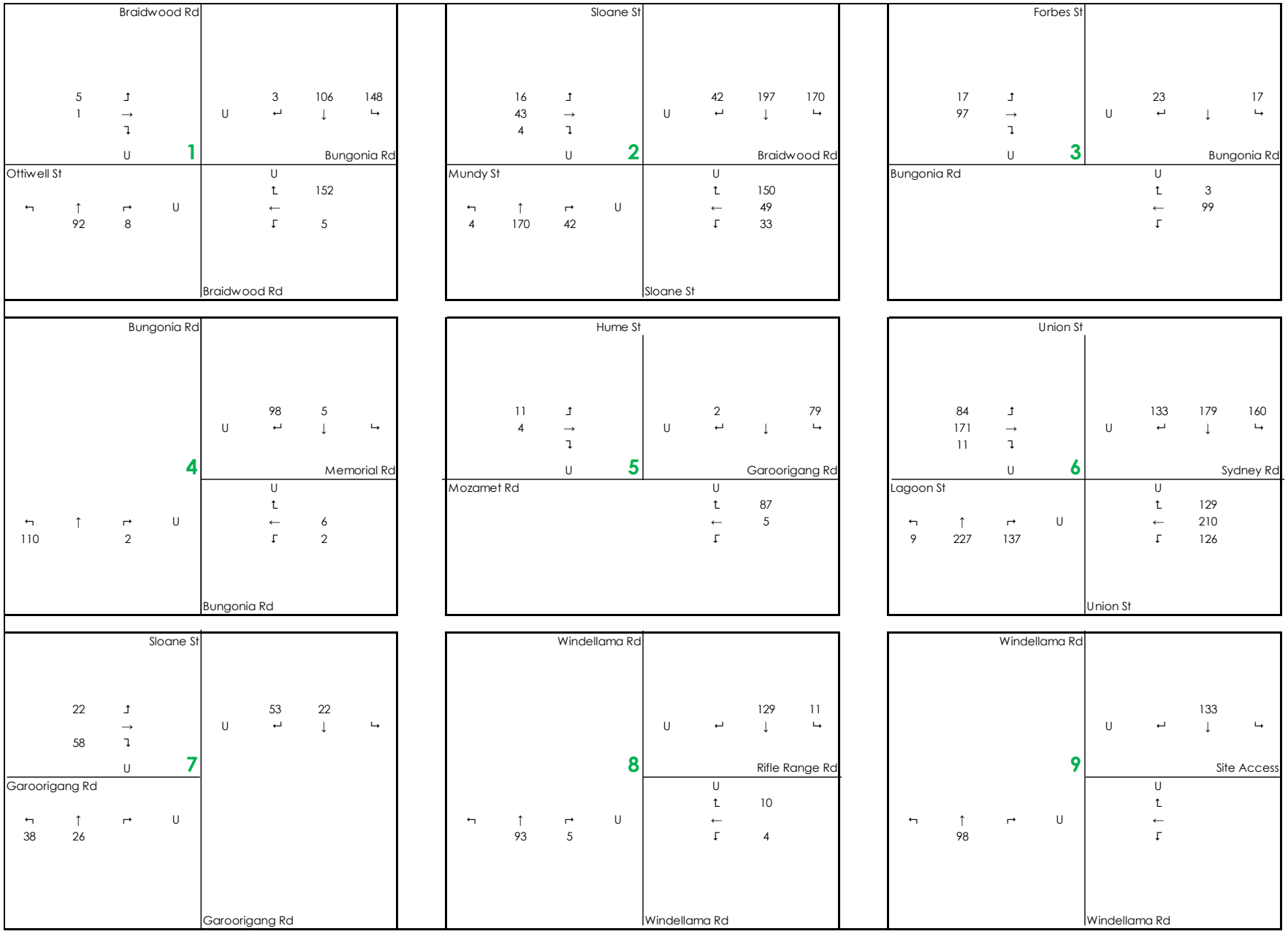
2027 Base – Weekday AM Peak Hour – Total Traffic distributions (vehicles / hour)



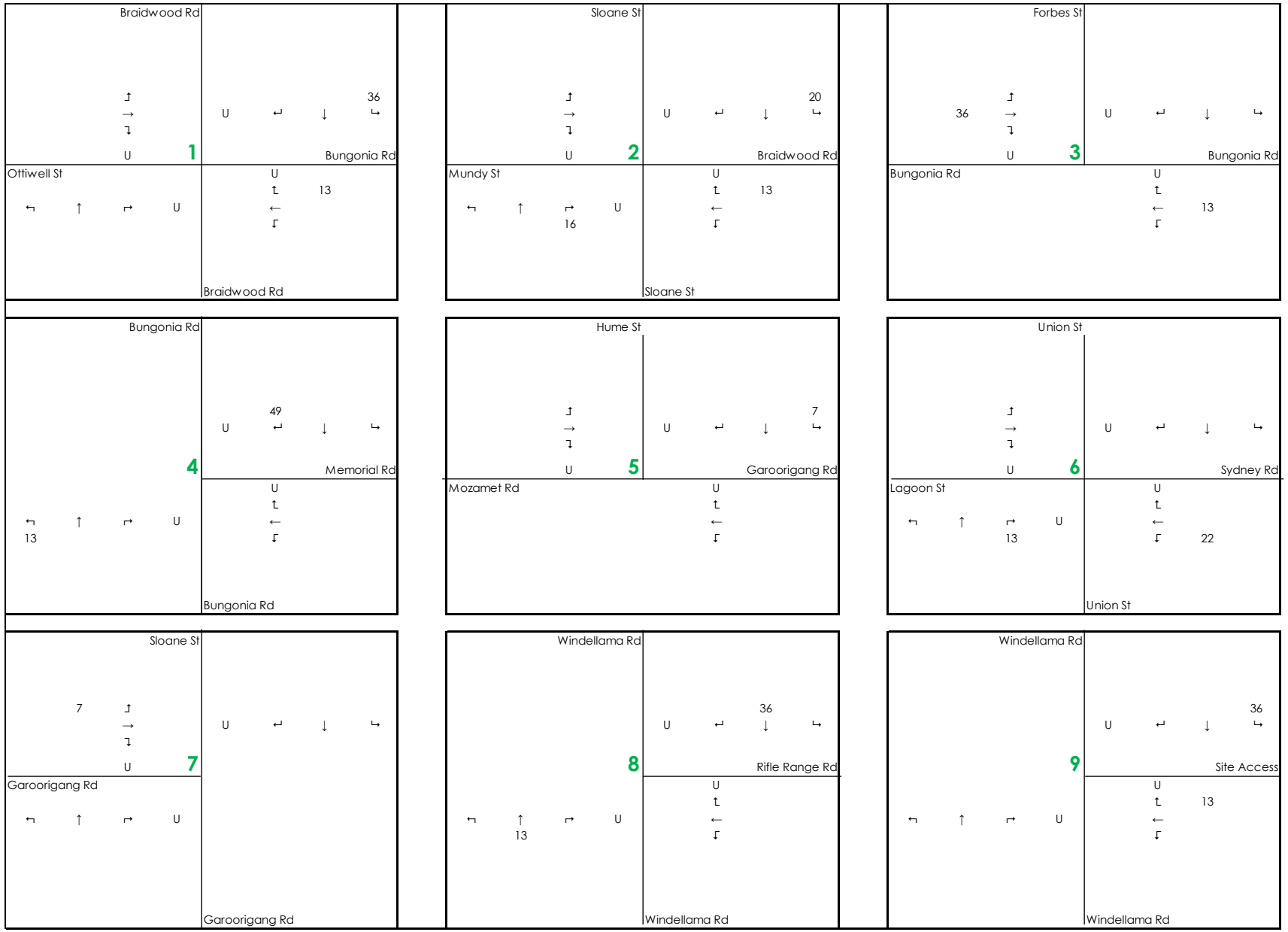
2027 Base – Weekday PM Peak Hour – Total Traffic distributions (vehicles / hour)



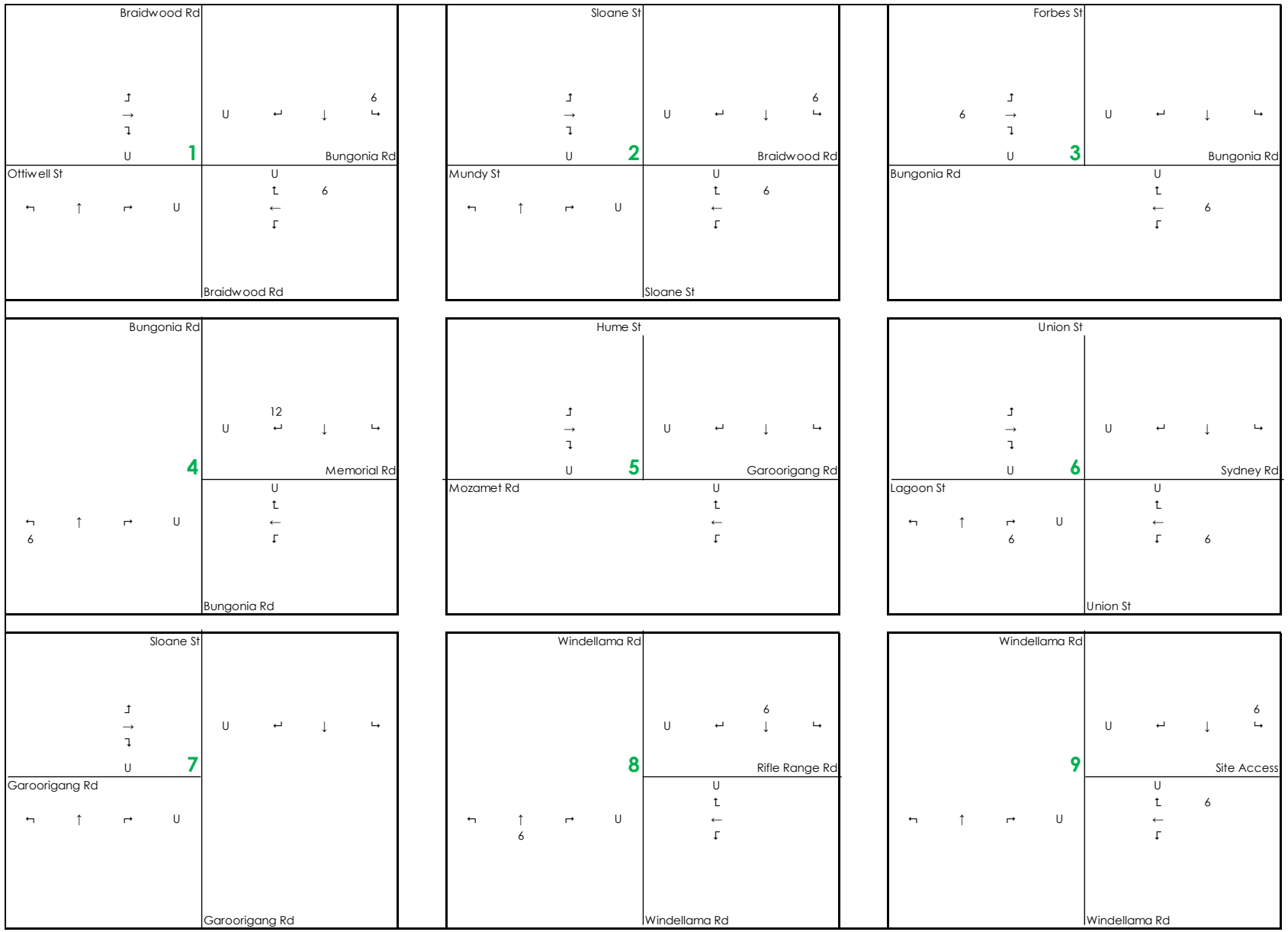
2027 Base – Saturday Midday Peak Hour – Total Traffic distributions (vehicles / hour)



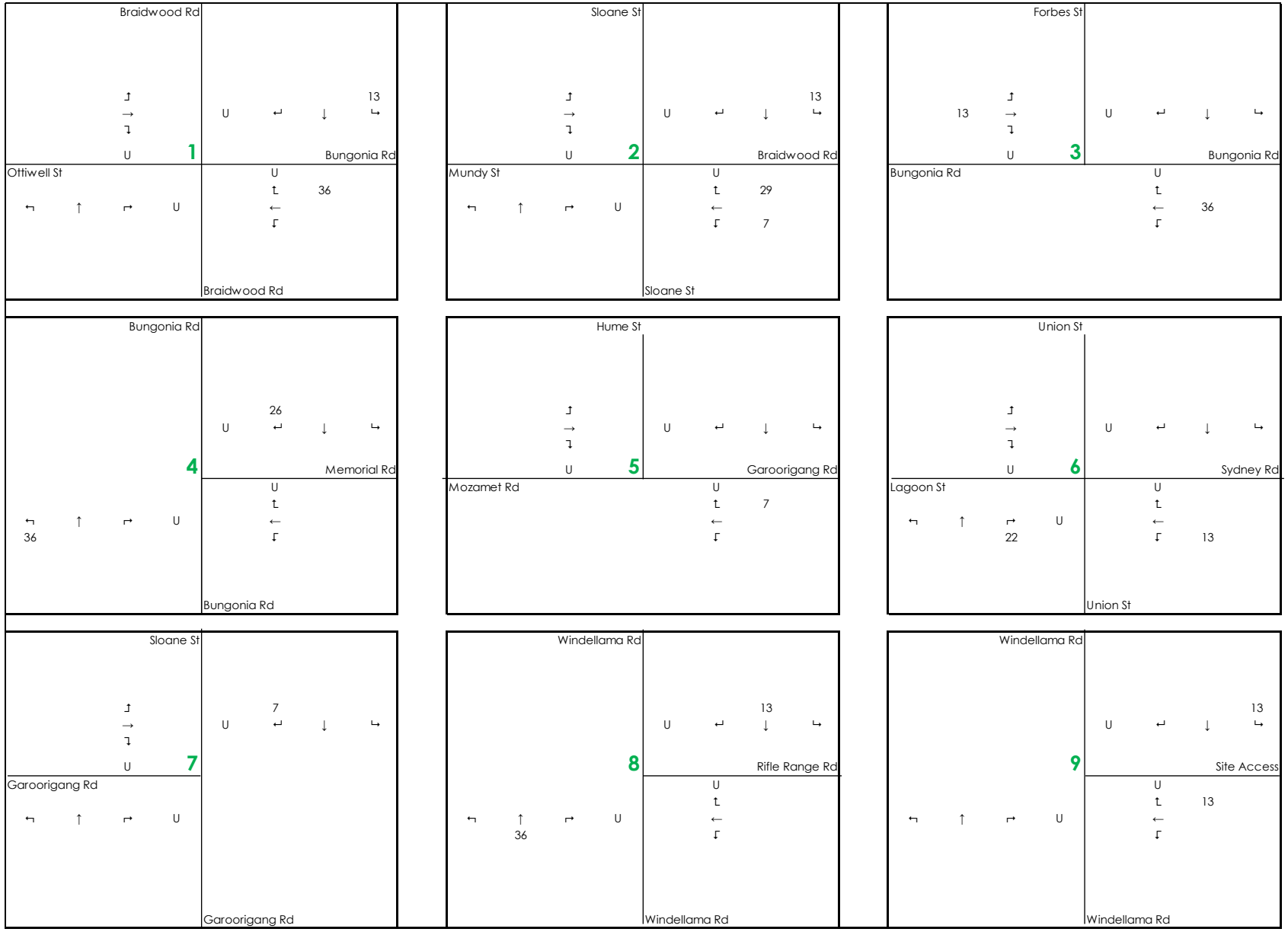
2027 – Weekday AM Peak Hour – Gundary Solar Farm Project Traffic Light Vehicles (vehicles / hour)
Option 1 – Sydney Road Route (north)



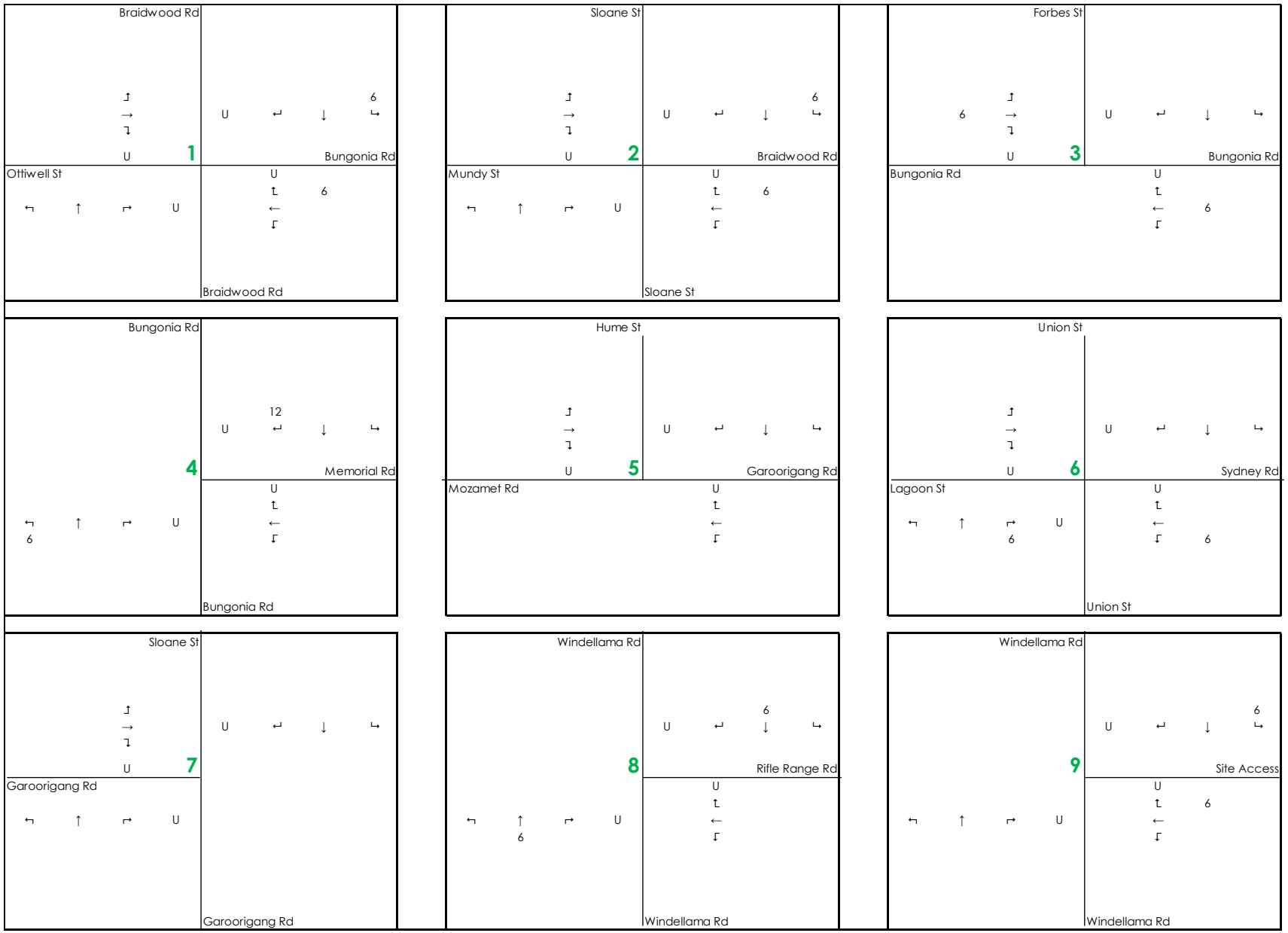
2027 – Weekday AM Peak Hour – Gundary Solar Farm Project Traffic Heavy Vehicles (vehicles / hour)
Option 1 – Sydney Road Route (north)



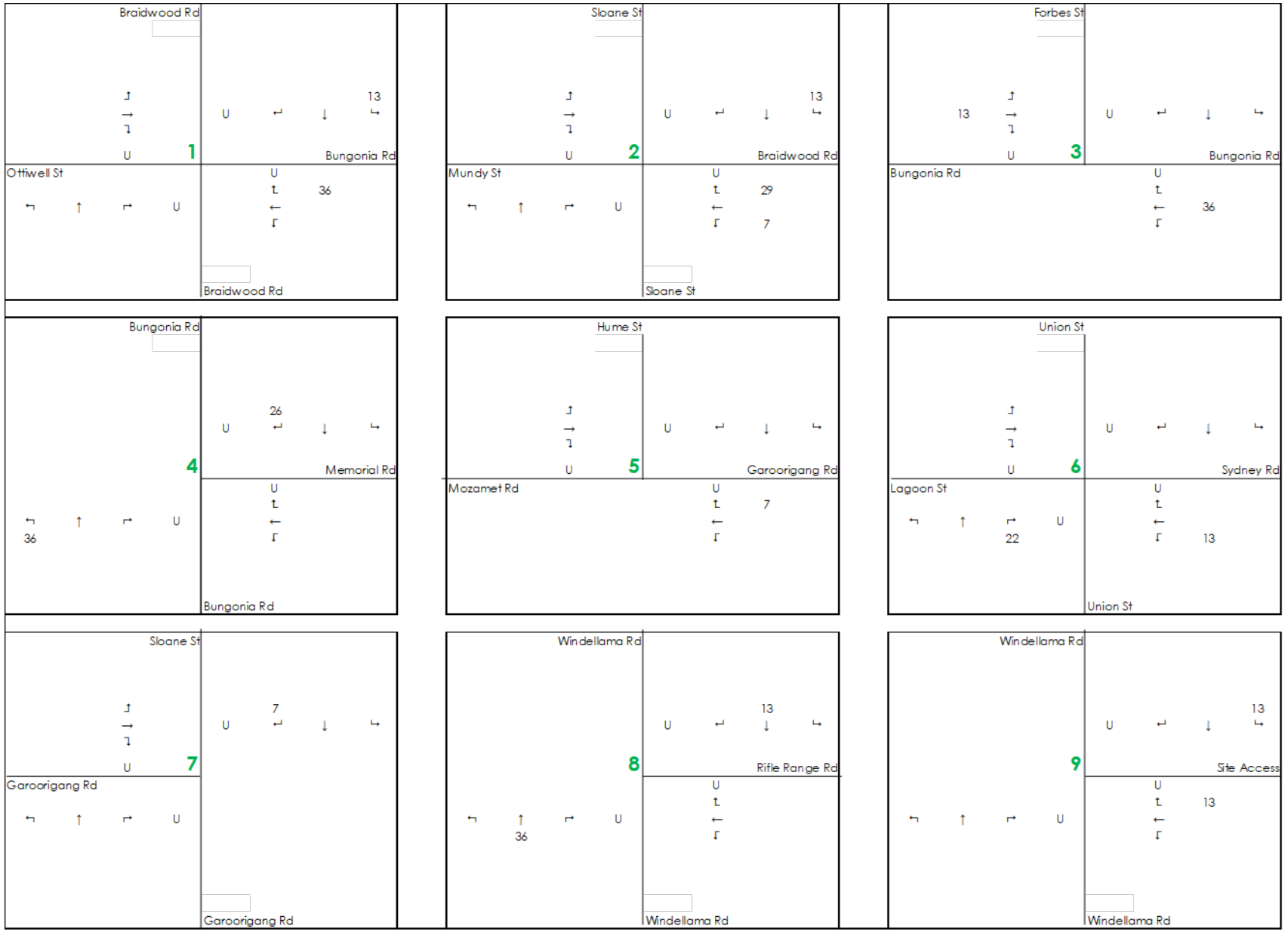
2027 – Weekday PM Peak Hour – Gundary Solar Farm Project Traffic Light Vehicles (vehicles / hour)
Option 1 – Sydney Road Route (north)



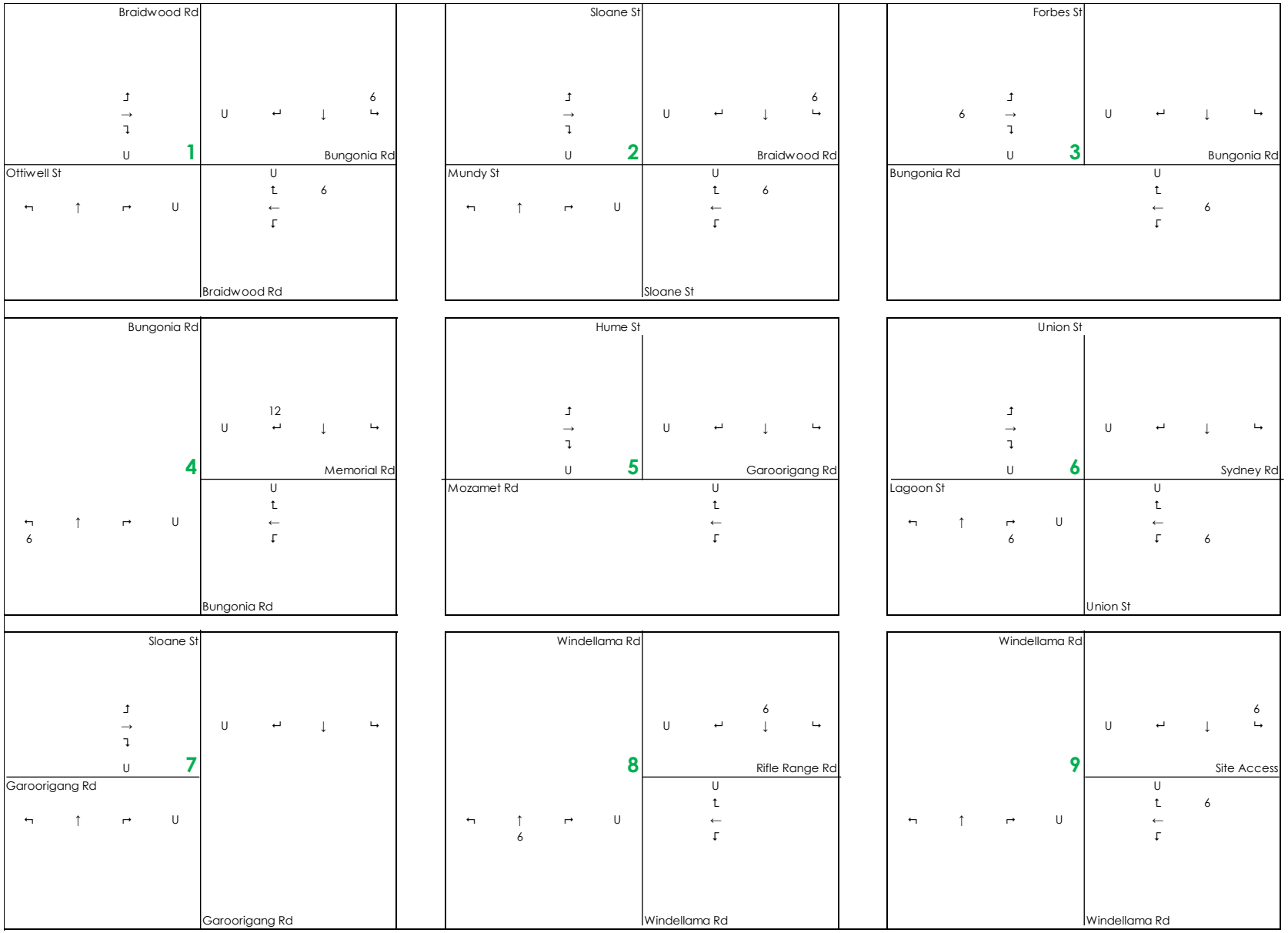
2027 – Weekday PM Peak Hour – Gundary Solar Farm Project Traffic Heavy Vehicles (vehicles / hour)
Option 1 – Sydney Road Route (north)



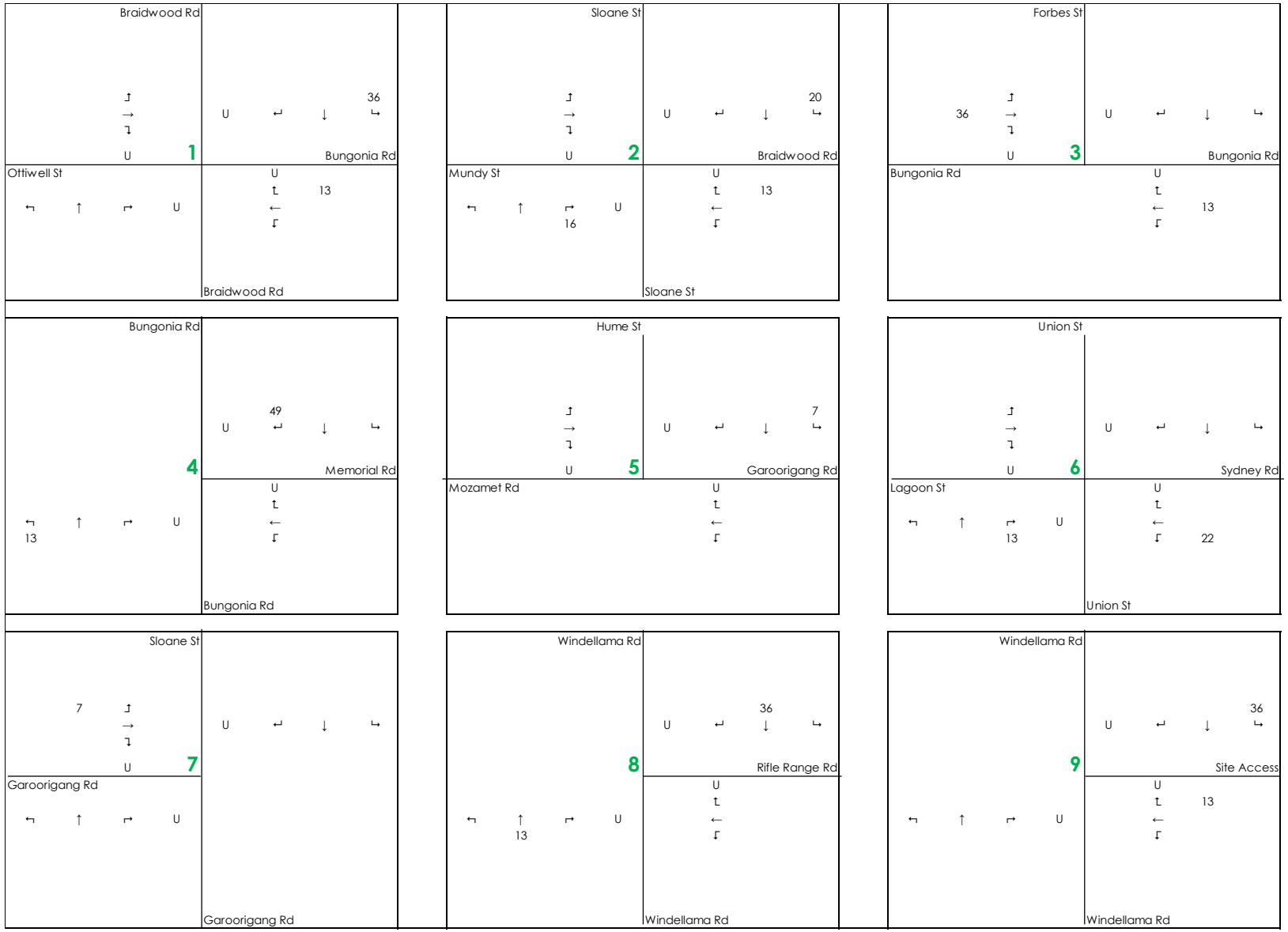
2027 – Saturday Midday Peak Hour – Gundary Solar Farm Project Traffic Light Vehicles (vehicles / hour)
Option 1 – Sydney Road Route (north)



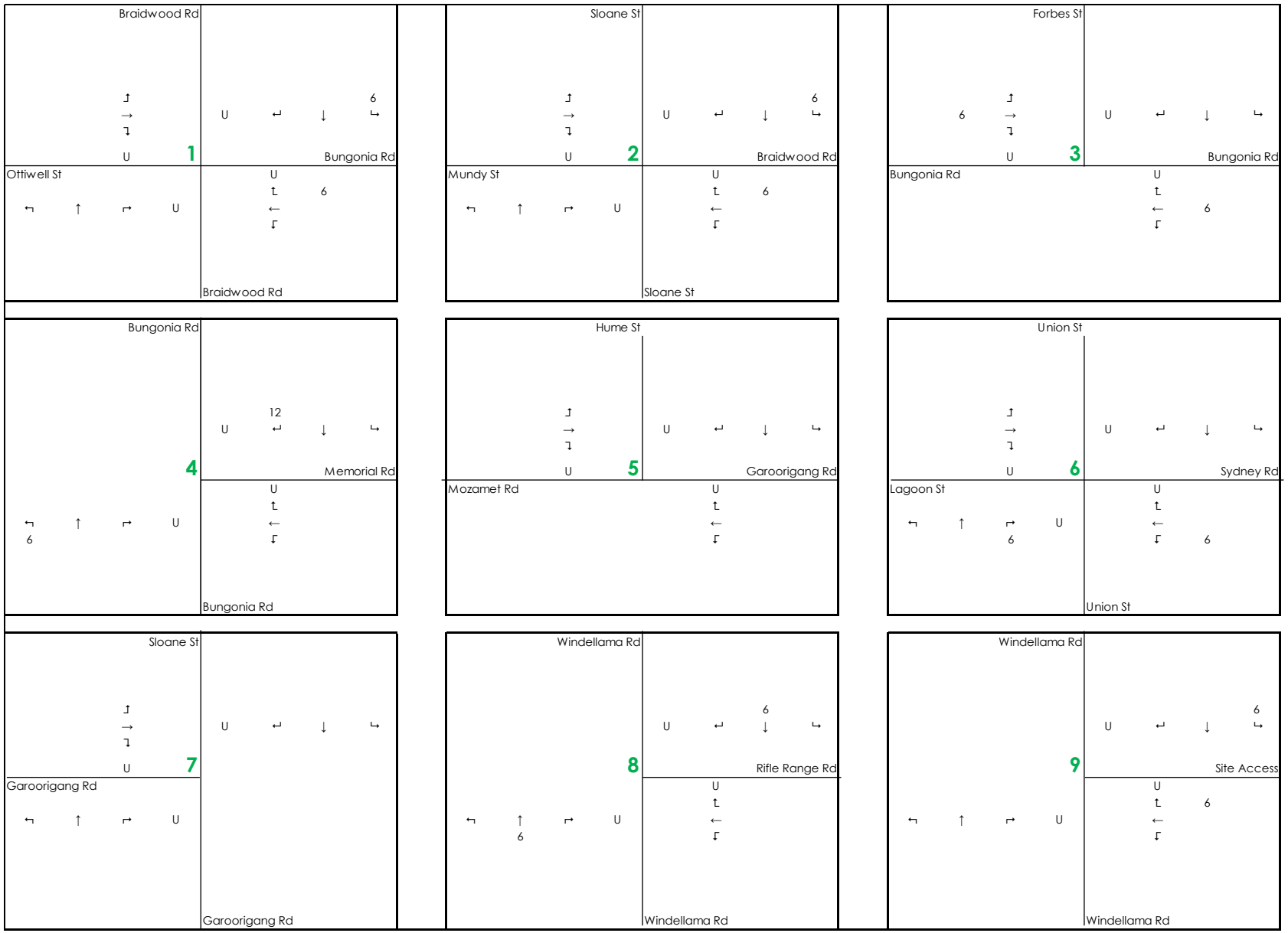
2027 – Saturday Midday Peak Hour – Gundary Solar Farm Project Traffic Heavy Vehicles (vehicles / hour)
Option 1 – Sydney Road Route (north)



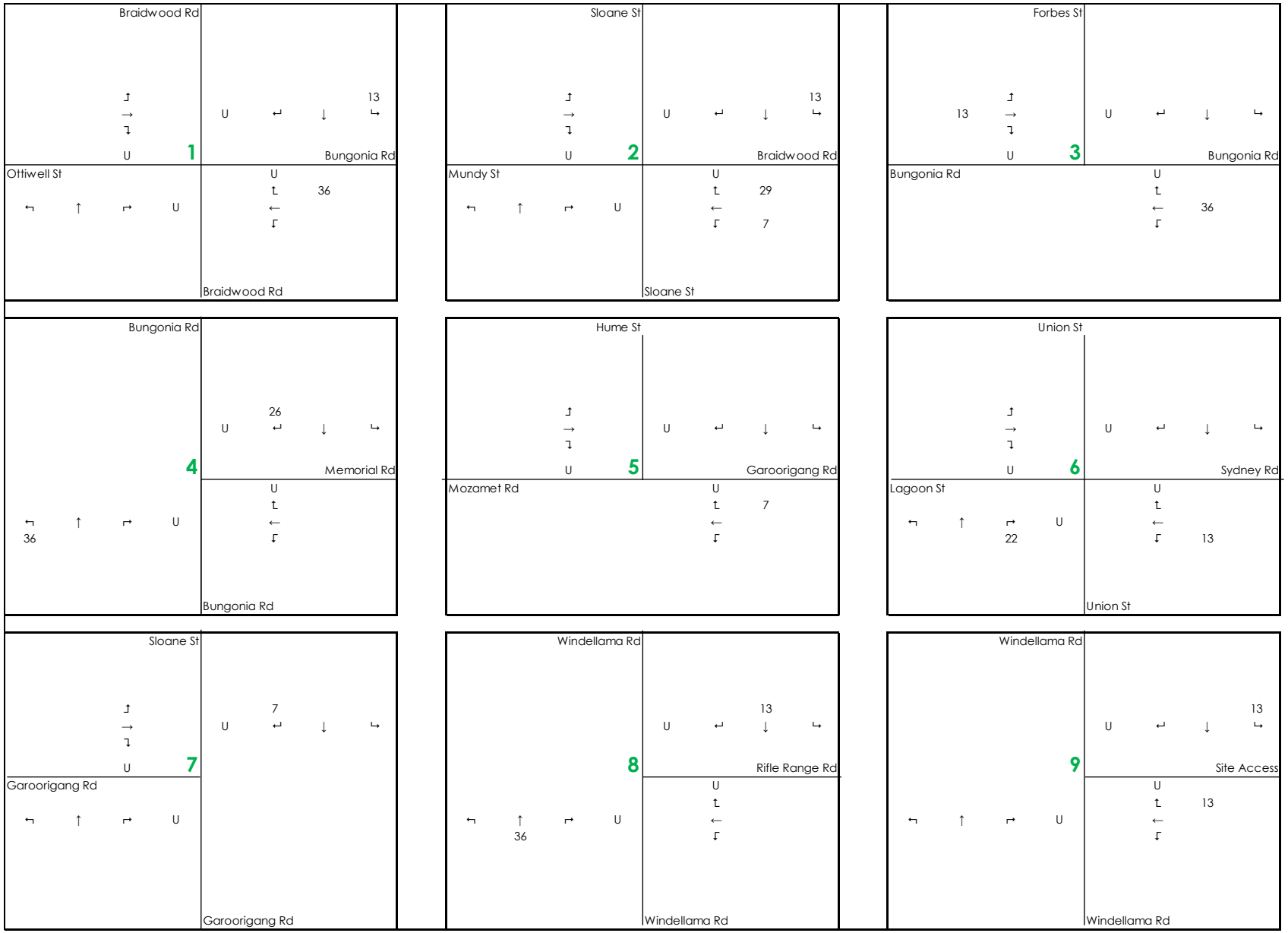
2027 – Weekday AM Peak Hour – Gundary Solar Farm Project Traffic Light Vehicles (vehicles / hour)
Option 2 – Hume St Route (south)



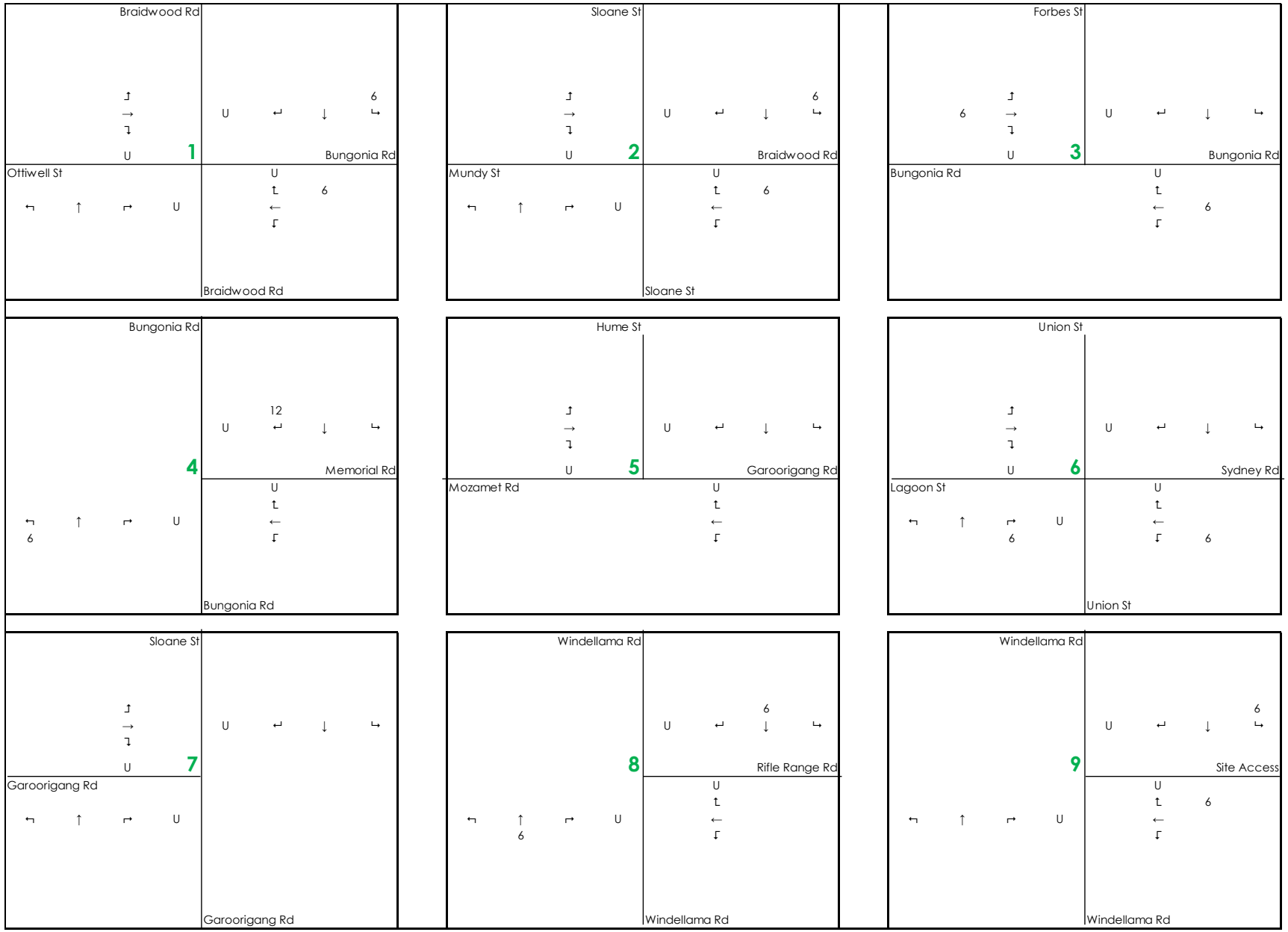
2027 – Weekday AM Peak Hour – Gundary Solar Farm Project Traffic Heavy Vehicles (vehicles / hour)
Option 2 – Hume St Route (south)



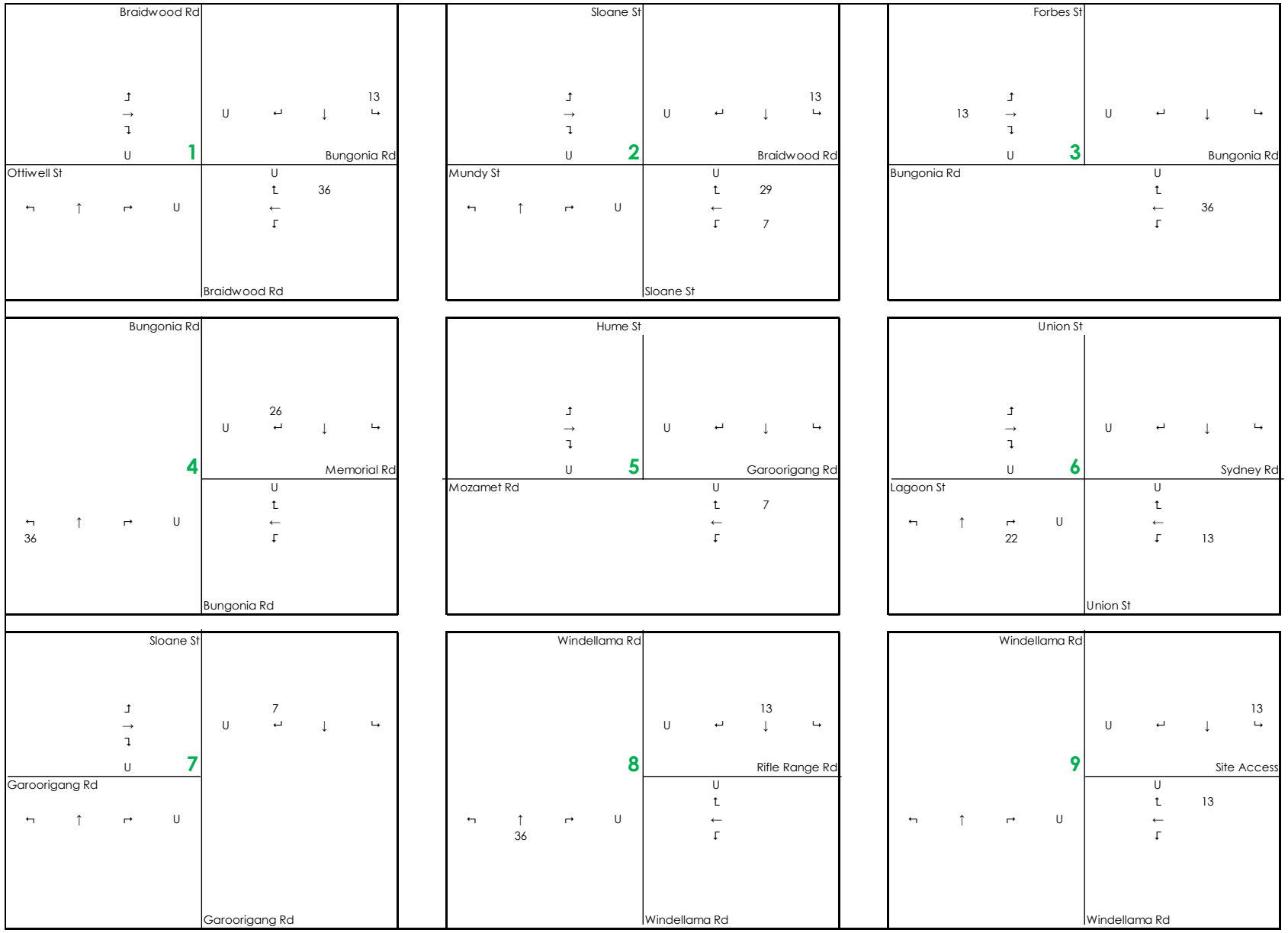
2027 – Weekday PM Peak Hour – Gundary Solar Farm Project Traffic Light Vehicles (vehicles / hour)
Option 2 – Hume St Route (south)



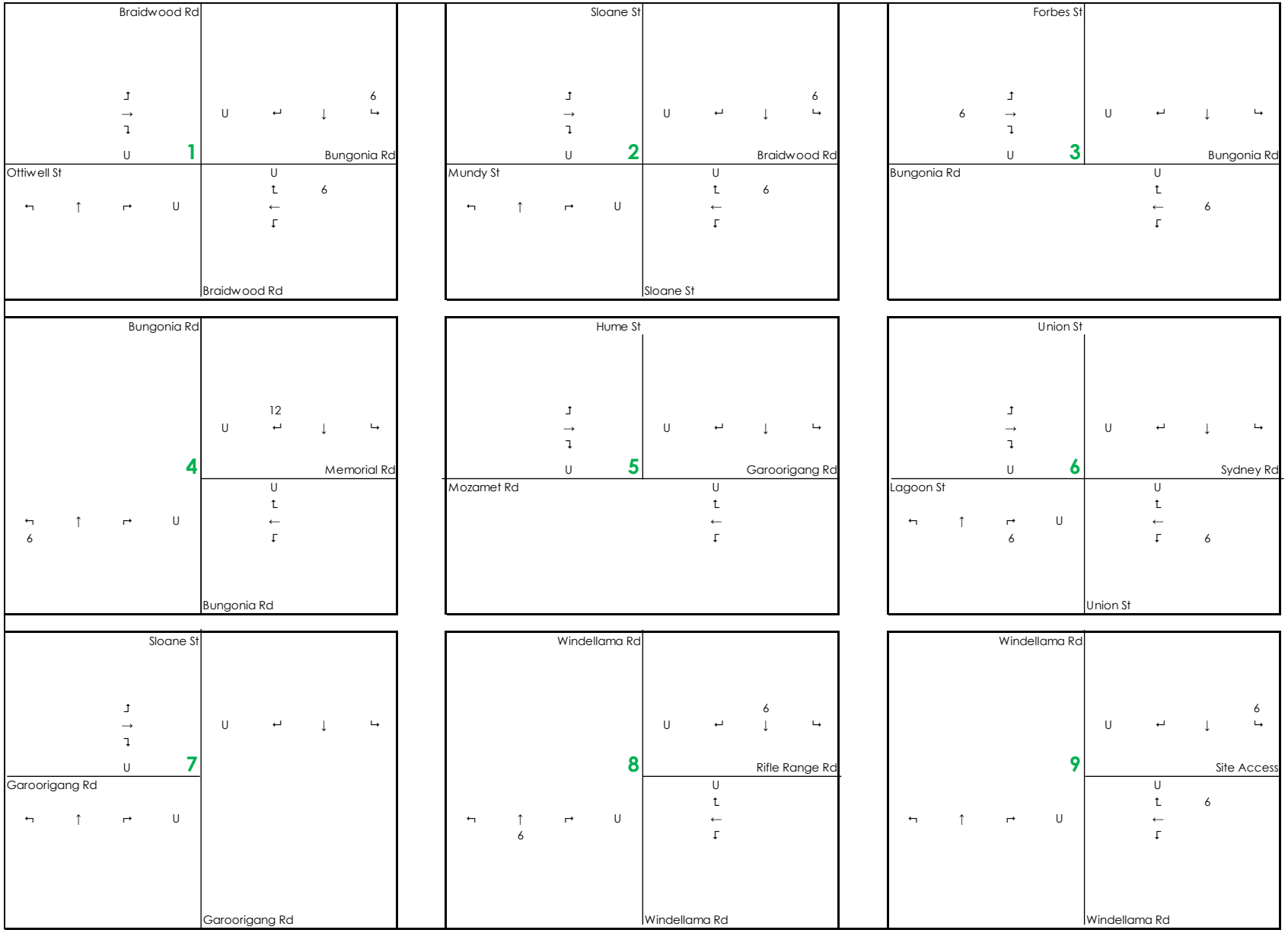
2027 – Weekday PM Peak Hour – Gundary Solar Farm Project Traffic Heavy Vehicles (vehicles / hour)
Option 2 – Hume St Route (south)



2027 – Saturday Midday Peak Hour – Gundary Solar Farm Project Traffic Light Vehicles (vehicles / hour)
Option 2 – Hume St Route (south)



2027 – Saturday Midday Peak Hour – Gundary Solar Farm Project Traffic Heavy Vehicles (vehicles / hour)
Option 2 – Hume St Route (south)



Appendix D

Transport Route Swept Path Analysis

Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM

TITLE: SWEPT PATH ANALYSIS - SOUTHERN ROUTE - HUME STREET/GARROORIGANG ROAD
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001 FIGURE 1

DATE STAMP: 17 AUGUST 2023

PROJECT No.	SCALE	REV.
23042	1:400 @A3	A

Filename: 23042CAD001-230817-SWEPT PATH.dwg
Date: 17 August 2023

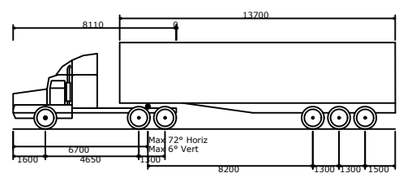
GARROORIGANG ROAD

SLOANE STREET

GARROORIGANG STREET

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT

GUNDARY SOLAR FARM

TITLE

SWEPT PATH ANALYSIS - SOUTHERN ROUTE - GARROORIGANG ROAD/SLOANE STREET
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001
FIGURE 2

DATE STAMP 17 AUGUST 2023

PROJECT No. 23042 | SCALE 1:400 @A3 | REV. A

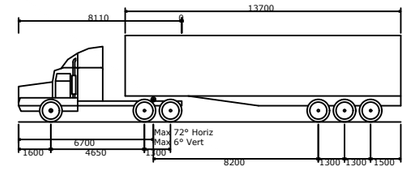
Filename: 23042CAD001-230817-SWEPT PATH.dwg

Date: 17 August 2023

MUNDY STREET

SLOANE STREET

BRAIDWOOD ROAD



Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM

TITLE: SWEPT PATH ANALYSIS - SOUTHERN ROUTE - SLOANE STREET/BRAIDWOOD ROAD
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001
FIGURE 3

DATE STAMP: 17 AUGUST 2023

PROJECT No.	SCALE	REV.
23042	1:400 @A3	A

Filename: 23042CAD001-230817-SWEPT PATH.dwg
Date: 17 August 2023

LAGOON STREET

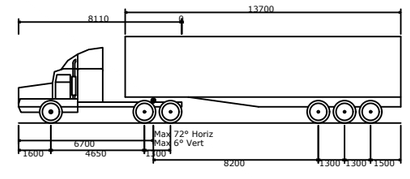
SYDNEY ROAD

UNION STREET

40

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT

GUNDARY SOLAR FARM

TITLE

SWEPT PATH ANALYSIS - NORTHERN ROUTE - SYDNEY ROAD/UNION STREET
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001 FIGURE 4

DATE STAMP 17 AUGUST 2023

PROJECT No.	SCALE	REV.
23042	1:500 @A3	A

Filename: 23042CAD001-230817-SWEPT PATH.dwg

Date: 17 August 2023

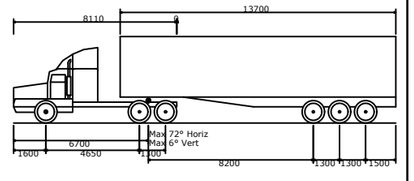
MUNDY STREET

SLOANE STREET

BRAIDWOOD ROAD

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT

GUNDARY SOLAR FARM

TITLE

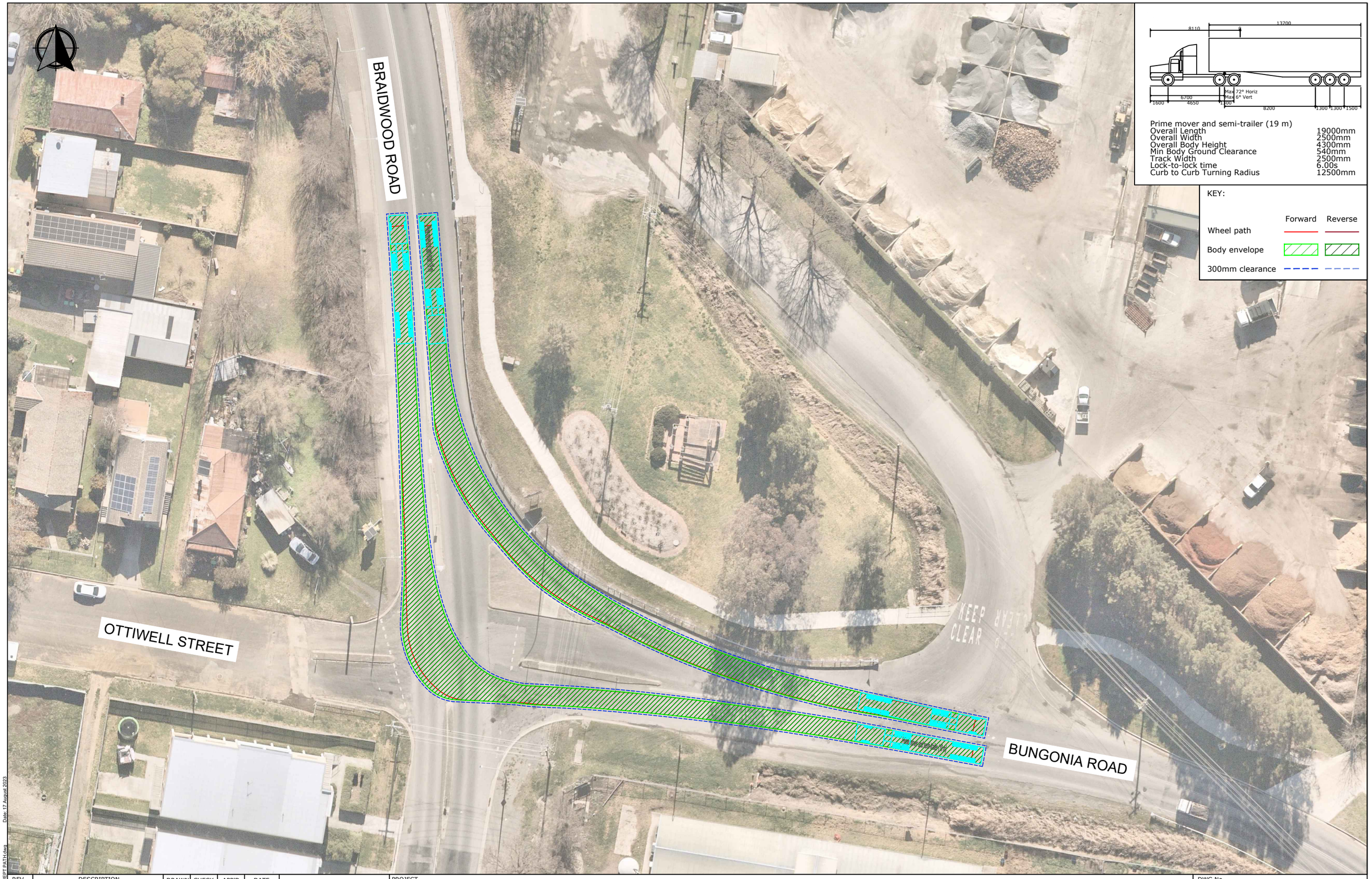
SWEPT PATH ANALYSIS - NORTHERN ROUTE - SLOANE STREET/BRAIDWOOD ROAD
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001
FIGURE 5

DATE STAMP 17 AUGUST 2023

PROJECT No.	SCALE	REV.
23042	1:500 @A3	A

Filename: 23042CAD001-230817-SWEPT PATH.dwg
Date: 17 August 2023



Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM

TITLE: SWEPT PATH ANALYSIS - BRAIDWOOD ROAD/BUNGONIA ROAD
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001 FIGURE 6		
DATE STAMP 17 AUGUST 2023		
PROJECT No. 23042	SCALE 1:500 @A3	REV. A

Filename: 23042CAD001-230817-SWEPT PATH.dwg
Date: 17 August 2023

Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT

GUNDARY SOLAR FARM

TITLE

SWEPT PATH ANALYSIS - BUNGONIA ROAD
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001 FIGURE 7

DATE STAMP 17 AUGUST 2023

PROJECT No. 23042 | SCALE 1:1000 @A3 | REV. A

Filename: 23042CAD001-230817-SWEPT PATH.dwg Date: 17 August 2023

Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JG	JR	JR	17/08/23

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM

TITLE: SWEPT PATH ANALYSIS - WINDELLEMA ROAD
AUSTROADS (2013) 19m PRIME MOVER AND SEMI-TRAILER

DWG No. 23042CAD001 FIGURE 8

DATE STAMP: 17 AUGUST 2023

PROJECT No.	SCALE	REV.
23042	1:1000 @A3	A

Filename: 23042CAD001-230817-SWEPT PATH.dwg Date: 17 August 2023

Appendix E

Project Site Access Concept Layout

LEGEND:

- INDICATIVE EXISTING FEATURES
- PROPOSED FEATURES
- NEW SEALED PAVEMENT AREA

INDICATIVE EXISTING LANE WIDTH

TIE INTO EXISTING PAVEMENT

PROPOSED BAL ROAD WIDENING GENERALLY IN ACCORDANCE WITH AUSTROADS GUIDE TO ROAD DESIGN PART 4A FIGURE 8.2 AND TABLE 8.1 BASED ON DESIGN SPEED OF 110km/h

R=15m

PROVIDE MINIMUM 10m SEALED ROAD AS SHOWN

HARDSTAND FOR OSOM VEHICLES

R=15m

TIE INTO EXISTING PAVEMENT

WINDELLAMA ROAD

WINDELLAMA ROAD

SITE ACCESS ROAD

SITE ACCESS ROAD

3.5m
3.5m
13.5m
35m
3.5m
3.5m
6m
10m
E1
EDGE OF PAVEMENT
C1
TB1
TF
7.5m
E1
E1
EDGE OF PAVEMENT
7m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KR	JR	JR	06/06/25

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM (GOULBURN) -WINDELLAMA ROAD INTERSECTION

TITLE: CONCEPT PLAN

DWG No. 23042CAD02-FIGURE 1

DATE STAMP: 6 June 2025

PROJECT No. 23042

SCALE 1:500 @A3

REV. A

Filename: 23042CAD02-250606-Windellama Design Review

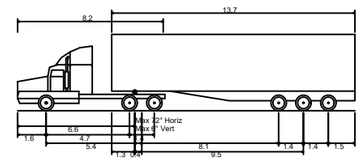
VEHICLE LEFT-IN

WINDELLAMA ROAD

SITE ACCESS ROAD

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KR	JR	JR	06/06/25

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM (GOULBURN) -WINDELLAMA ROAD INTERSECTION

TITLE: SWEPT PATH ASSESSMENT

DWG No. 23042CAD02-FIGURE 2

DATE STAMP: 6 June 2025

PROJECT No. 23042 | SCALE 1:500 @A3 | REV. A

Filename: 23042CAD02-250606-Windellama Design Review

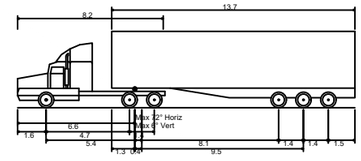
VEHICLE LEFT-IN

WINDELLAMA ROAD

SITE ACCESS ROAD

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KR	JR	JR	06/06/25

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM (GOULBURN) -WINDELLAMA ROAD INTERSECTION

TITLE: SWEPT PATH ASSESSMENT

DWG No. 23042CAD02-FIGURE 3

DATE STAMP: 6 June 2025

PROJECT No.	SCALE	REV.
23042	1:500 @A3	A

Filename: 23042CAD02-250606-Windellama Design Review

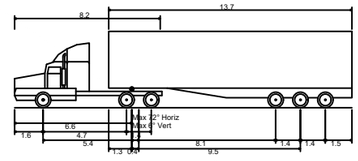
VEHICLE RIGHT-OUT

WINDELLAMA ROAD

SITE ACCESS ROAD

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
500mm clearance		



AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KR	JR	JR	06/06/25

ttpp transport planning

PROJECT: GUNDARY SOLAR FARM (GOULBURN) -WINDELLAMA ROAD INTERSECTION

TITLE: SWEPT PATH ASSESSMENT-RIGHT-OUT MOVEMENT

DWG No. 23042CAD02-FIGURE 4

DATE STAMP: 6 June 2025

PROJECT No.	SCALE	REV.
23042	1:500 @A3	A

Filename: 23042CAD02-250606-Windellama Design Review

Appendix F

OSOM Route Study

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GUNDARY SOLAR FARM

OSOM Route Study

Date: November 2025
Client: Umwelt
Type: Desktop Survey
Rev: 2

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Revision History

Revision	Date	Details	Prepared	Checked	Approved
0	24/04/2025	First issue	ICW	JW	JJM
1	20/05/2025	Updated with client comments	ICW	JW	JJM
2	28/10/2025	Updated with TfNSW feedback	ICW	AC	JJM

Disclaimer

This report has been prepared for advisory purposes only. Information provided within the report is based on data provided by the Client as well as publicly available information and, to the best of ARES Group's knowledge and experience, is accurate at the time of publication. All proposed routes, methodologies and schedules described in this report are subject to approval and issue of permits from the relevant stakeholders. Transport equipment is based on ARES Group vehicles and trailers, and swept path analysis results may differ if using equipment by third parties.

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Introduction

Gundary SF (or Solar Farm) is a renewable energy development located near Goulburn in New South Wales. The facility has a proposed capacity of 400MW (DC) with a supporting BESS (or Battery Energy Storage System) also part of the development.

The project is located approximately 10km south-east of Goulburn, in the Goulburn Mulwaree region. It is ideally located adjacent to transmission infrastructure as well as a regional load centre (the town of Goulburn).

ARES have been tasked by our customer Umwelt to undertake a Route Survey from the Ports of Botany and Port Kembla to site. The purpose of the study is to determine the pinch points along the routes and give best estimates of modifications and works required to enable oversize overmass (OSOM) cargo to be brought to site.

The study is designed for those involved in the project that have a limited knowledge of transportation, including a comprehensive outline of the routes and actions required to achieve delivery.

01

Overview

Project Overview

The Gundary SF is a renewable energy development near Goulburn in New South Wales currently in the planning and approvals stage.

Scope of Survey

Gundary SF is located just south of the regional town of Goulburn in New South Wales, within the Goulburn Mulwaree Local Government Area.

ARES has been tasked with surveying the route from the proposed Ports of Import (**Botany** and **Port Kembla**) to the project site. The survey will include everything up to the site entrance. The turn into the site entry point will be assessed for swept path requirements for input into civil design.

This is a desktop survey, relying on existing aerial imagery from sources such as Google and Nearmaps. ARES has also previously driven the transport route up to Goulburn from both Ports as part of other assessments and has included data gathered from those trips in this assessment.

We recommend that a physical survey of the entire route is completed at a later stage, once the route is confirmed and final OSOM component dimensions are known, to verify the results of this desktop survey.

Ports of Import

There are two proposed Ports of Import (POI) for the Project: Port of Botany (Sydney) and Port Kembla (Wollongong).

Port Botany is the main container port in NSW and also processes break bulk cargoes. The route out of the port is constrained by overhead structures in Sydney metro, but is otherwise a well developed and established oversize route.

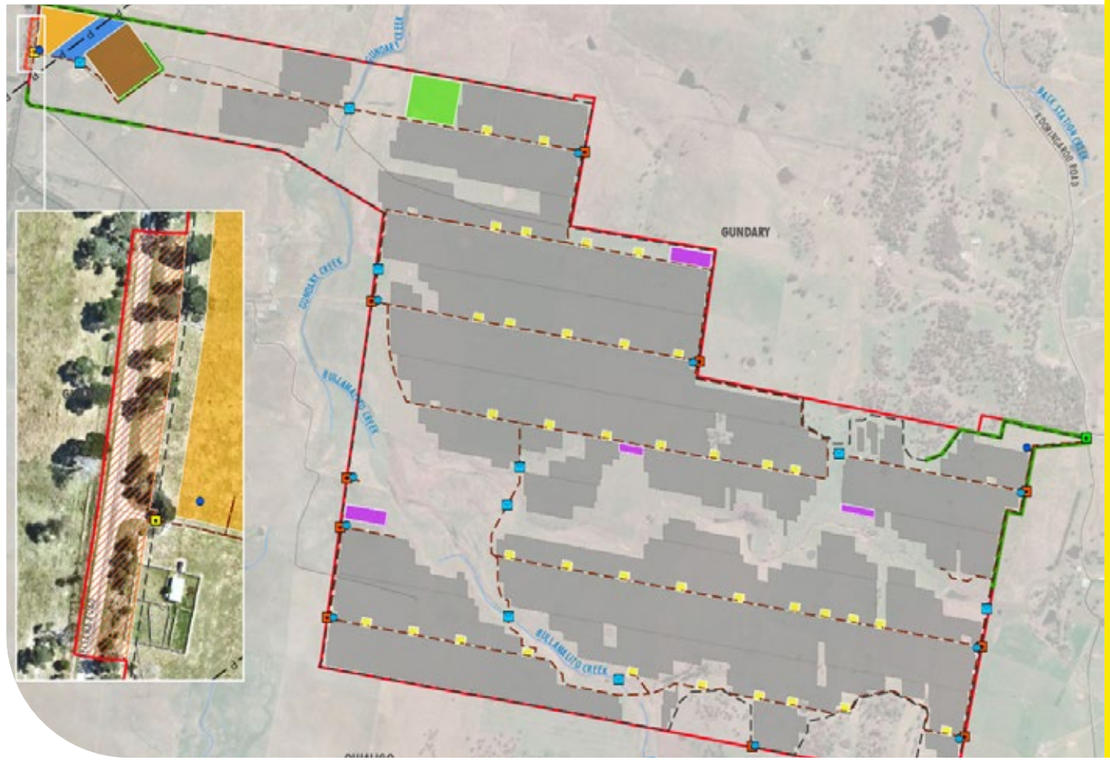
Situated close to Wollongong, Port Kembla has seen numerous large infrastructure projects over the last five years. ARES has worked out of Port Kembla on multiple projects, including several wind farms with hundreds of oversize components requiring transport.

Port Kembla has excellent break bulk cargo offloading capacity through the AAT berths. AAT also has a large concreted storage area where cargo can be stored and staged for deliveries to site, with additional options for off-site storage should they be required.

Site

The project is accessed via Windellama Rd to the south of Goulburn. There is a single access point turning left (east) into the project area. A preliminary civil design for the site access point was provided by the client for reference.

ARES have assessed the turn into the site access track for swept path as part of our scope of works.



Above: Aerial view of Port Kembla, showing AAT terminal and storage areas on right. **Below:** Site overview of the Gundary SF facility.

Transport Methodology

Specialized cargo requires specialized transport solutions.

Cargo Dimensions

The majority of deliveries to the project will be in gauge and able to be delivered under gazette. The largest oversize, overmass (OSOM) component of the project is the delivery of the one-off main transformer. The exact weights and dimensions of this load is yet to be finalised but the following has been assumed for the purposes of this route assessment:

- Length: 9.95m
- Width: 3.33m
- Height: 4.2m
- Weight: 170 tons

Equipment

Due to the height of the load, it will need to be transported on a custom platform trailer with drop frame. The drop frame ensures the transformer sits as low as possible to clear overhead obstructions along the route.

Refer to the equipment schematic shown below for a mock-up of the proposed transport arrangement. Overall dimensions are:

- Length: 47.5m (excluding rear block truck)
- Width: 4.3m
- Height: 4.8m
- Gross Combination Mass: 295 tons
- Mass per Axle: 17.0 tons

Note: axle weights are approximate as the proposed length of the transformer would require a longer drop frame than what is shown below, which can only accommodate 7.5m components.

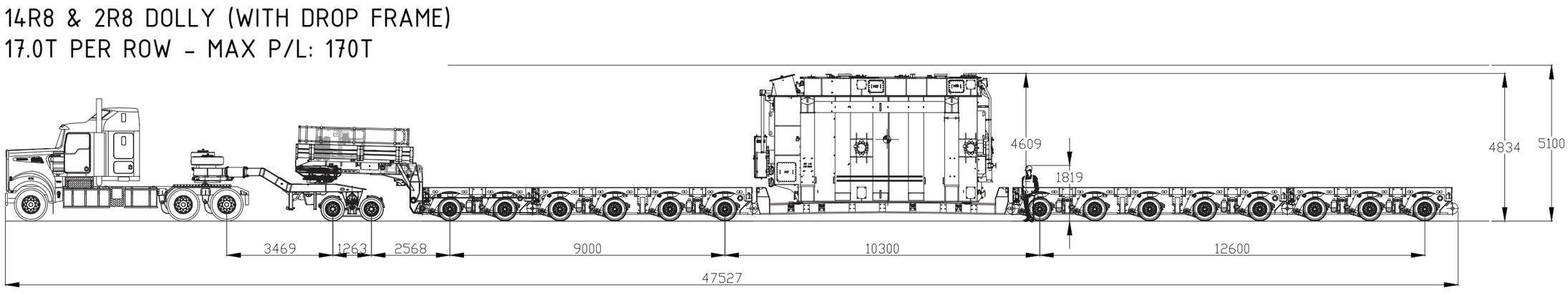
The transformer is classified as a 'High Risk' OSOM Load" by Transport for NSW due to its weight. An OSOM Transport Management Plan (TMP) will be required and approved by TfNSW prior to transport.

Pilots & Escorts

The load will be accompanied by both NSW police escort vehicles and oversize pilot vehicles. NSW police will carry out all required traffic management and control at pinch points, whilst the pilot vehicles will provide advanced warning (front and rear) of the OSOM load's approach and assist the police escorts as directed.

If any street furniture such as signs need to be removed for the load to pass, the pilots will perform this task and replace the items once the load is through.

Above: ARES transporting a 170-ton transformer on a custom drop frame trailer. **Below**: Schematic of proposed trailer for Gundary SF.



General Route Notes

Port Botany/Port Kembla to Gundary SF (all routes)

Road Quality

The transport routes will be primarily along the NSW state highway and motorway network, which is generally designed to a higher specification and able to handle heavier and higher volumes of traffic. The route is fully paved up to the site access road.

The routes follow roads on the approved NSW OSOM Load Carrying Vehicle Network, deviating only when exiting the Hume Hwy (Route 2) and upon reaching Bungonia Rd/Windellama Rd on the final section into site.

Overhead Structures

There are numerous low structures down to around 5.1m clearance when exiting Sydney and along the Hume Hwy. The route taken out of Sydney is a common OSOM corridor and height constraints are well documented.

The oversize overmass route out of Port Kembla involves taking the M1 Princes Motorway and Picton Rd to the Hume Hwy. There are a number of low bridges over the motorway when departing Port Kembla. The lowest of these is the University Avenue Bridge, which has a listed clearance of 4.9m but has been measured by ARES to have a clearance of **5.2m** in the left hand lane. There are also several other bridges with between 5.3-5.4m clearance. These are all non-bypassable.

The ARES transport solution allows the 4.2m high transformer to be transported at a height of 4.84m, allowing the load to pass under all bridges with no issues. In the case of the University Ave bridge, ARES will hydraulically lower the trailer by an additional 100mm for additional clearance to the bridge.

Overhead Power Lines

In general, a travel height below around 5.5m is not an issue with respect to power lines. Loads above 4.6m travel height will require a high load permit from the power authorities prior to travel.

We recommend that an overhead power line survey is conducted closer to the date of transport to confirm that no lines need to be lifted or modified to accommodate the OSOM loads for this project.

The route traverses through the Endeavour Energy and Essential Energy distribution networks.

Bridges and Culverts

Structures on state highways and roads are generally not a concern as they will be designed to handle heavy vehicle loads. Bridge assessments will still be required from the state road authority (Transport for NSW) or relevant asset owners to confirm that bridges along the route can be crossed. These have been submitted to TfNSW's Special Permits Unit (SPU) and are currently in progress.

Rail Crossings

There are no rail level crossings along the route.

Approvals may be required when travelling over railway lines on bridges.

Road Works

There are planned roadworks and road upgrade projects along the route which will need to be considered when planning for transport of OSOM components to the Project. These include:

- Mount Ousley interchange project - there will be a new overpass of the M1 Princes Motorway as part of these works which may cause disruptions for OSOM traffic on the route.

Close co-ordination with Transport for NSW will be required once dates firm up for the project to ascertain which road upgrade projects are active at the time of transport, and whether there are special conditions or access restrictions for OSOM loads (e.g. detours, speed restrictions, width restrictions etc).

Approvals

Transport permits will need to be obtained from the National Heavy Vehicle Regulator (NHVR) prior to travel. The permit process includes getting feedback from state transport authorities as well as any local councils along the route.

Third party approvals include electricity authorities, rail authorities, toll road and tunnel operators.

Above: Artist's impression of Mt Ousley Interchange (Source: TfNSW)

Above:

University Avenue overpass of M1 Motorway - 5.2m clearance in left hand lane

Below:

Princes Hwy overpass of M1 Motorway - 5.3m clearance in right hand lane

02

Route 1 - Port Botany to Gundary SF

Route 1 Overview

ROUTE 1	
	START - Port Botany
0.0 KM	Bumborah Point Rd
0.6 KM	Botany Rd
1.2 KM	Bunnerong Rd
6.2 KM	Gardeners Rd
10.2 KM	Kent Rd
10.4 KM	Ricketty St
11.1 KM	Canal Rd
11.7 KM	Princes Hwy
15.3 KM	Forest Rd
17.9 KM	Stoney Creek Rd
21.9 KM	King Georges Rd
23.0 KM	M5 Mwy
42.7 KM	S Western Fwy
44.4 KM	M31 Hume Mwy
190.7 KM	Sydney Rd
194.1 KM	Union St/Sloane St
196.8 KM	Braidwood Rd
197.0 KM	Bungonia Rd
198.5 KM	Windellama Rd
206.5 KM	**FINISH - Gundary SF**

NHVR Route ID: 20JJ7-2 v1

Note 1: The return journey is expected to be the reverse of the above.

Note 2: Components may also take this option - refer to Route 2 and Pinch Points 17-20. However this is a non-preferred option and has only been assessed for completeness.

INTERACTIVE MAP LINK

Pinch Point

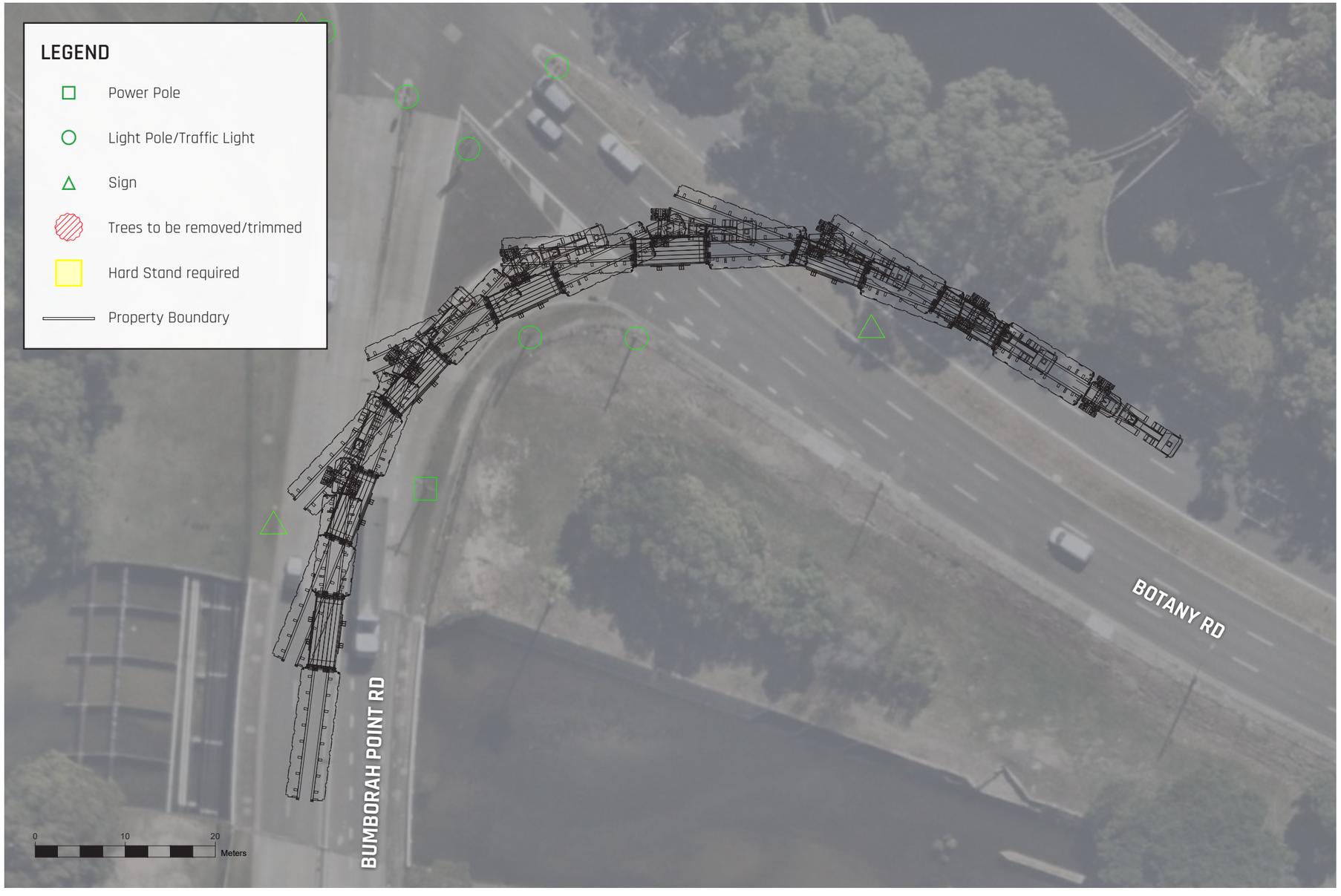
01

RIGHT TURN
Bumborah Point Rd
& Botany Rd

ROUTE 1

No modifications are required to turn onto Botany Rd, although the trailer will need to use the opposing slip lane and mount both the concrete traffic island on Bumborah Point Rd and the median strip on Botany Rd.

Police escorts will need to control traffic on Botany Rd in both directions whilst the contraflow manoeuvre is being completed.



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DRAWING TITLE:	SWEPT PATH DRAWING	SHEET NO:
DRAWING NAME:	Route Survey	REV

ARES GROUP - L1.05, 480 ST KILDA RD, MELBOURNE VIC 3004

Pinch Point

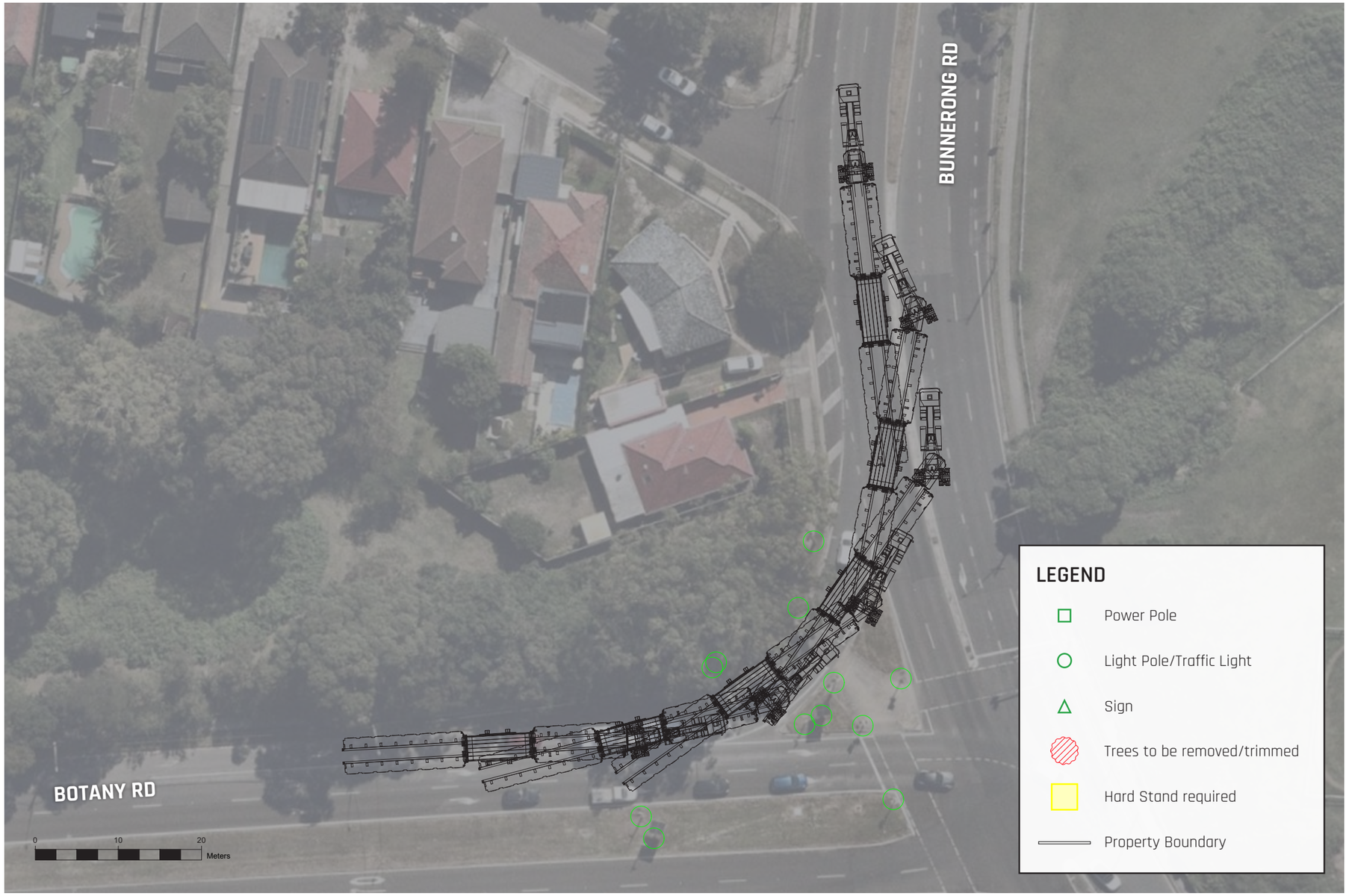
02

LEFT TURN
Botany Rd &
Bunnerong Rd

ROUTE 1

The transport combination can take this turn conventionally using the existing slip lane. Clearance to traffic lights is very tight and will require careful steering of the trailer around the corner.

The truck and trailer will need to mount the initial traffic island as well as cross the median onto the opposite side of Bunnerong Rd temporarily before returning to the correct side. Police escorts will need to control southbound traffic on Bunnerong Rd while this takes place.



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DRAWING NAME:	Route Survey	REV	

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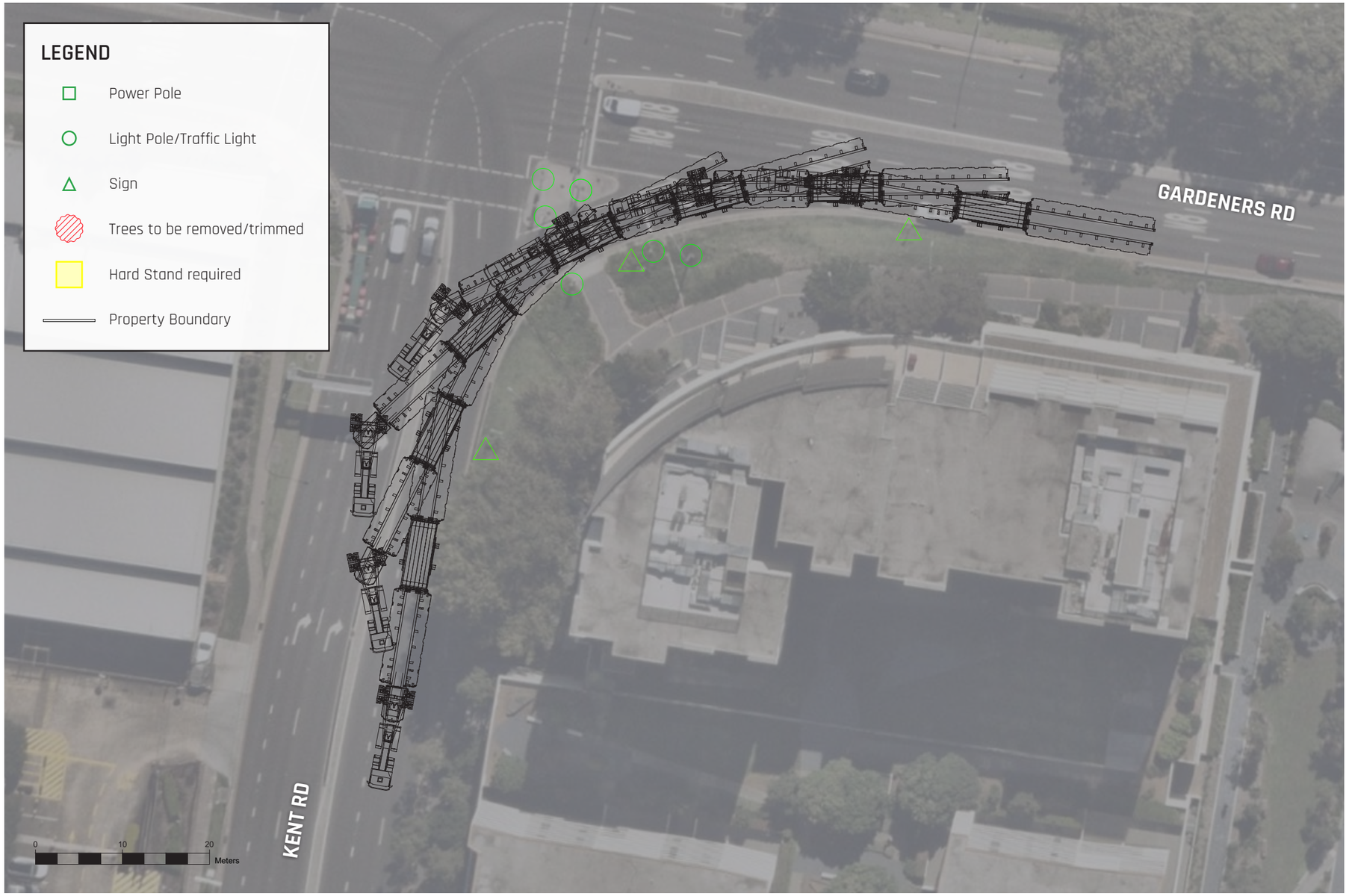
Pinch Point

03

LEFT TURN
Gardeners Rd
& Kent Rd

ROUTE 1

The transformer trailer will need to cross over onto the opposite side of Kent Rd when making this turn, requiring police escorts to control traffic. Otherwise, no modifications are required.



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Pinch Point

04

RIGHT TURN
Kent Rd &
Ricketty St

ROUTE 1

The transport combination can make this right hand turn conventionally with no modifications.

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	DRAWN DATE:	PROJECT: Gundary SF	SCALE NTS
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		DRAWING NAME: Route Survey	REV

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Pinch Point

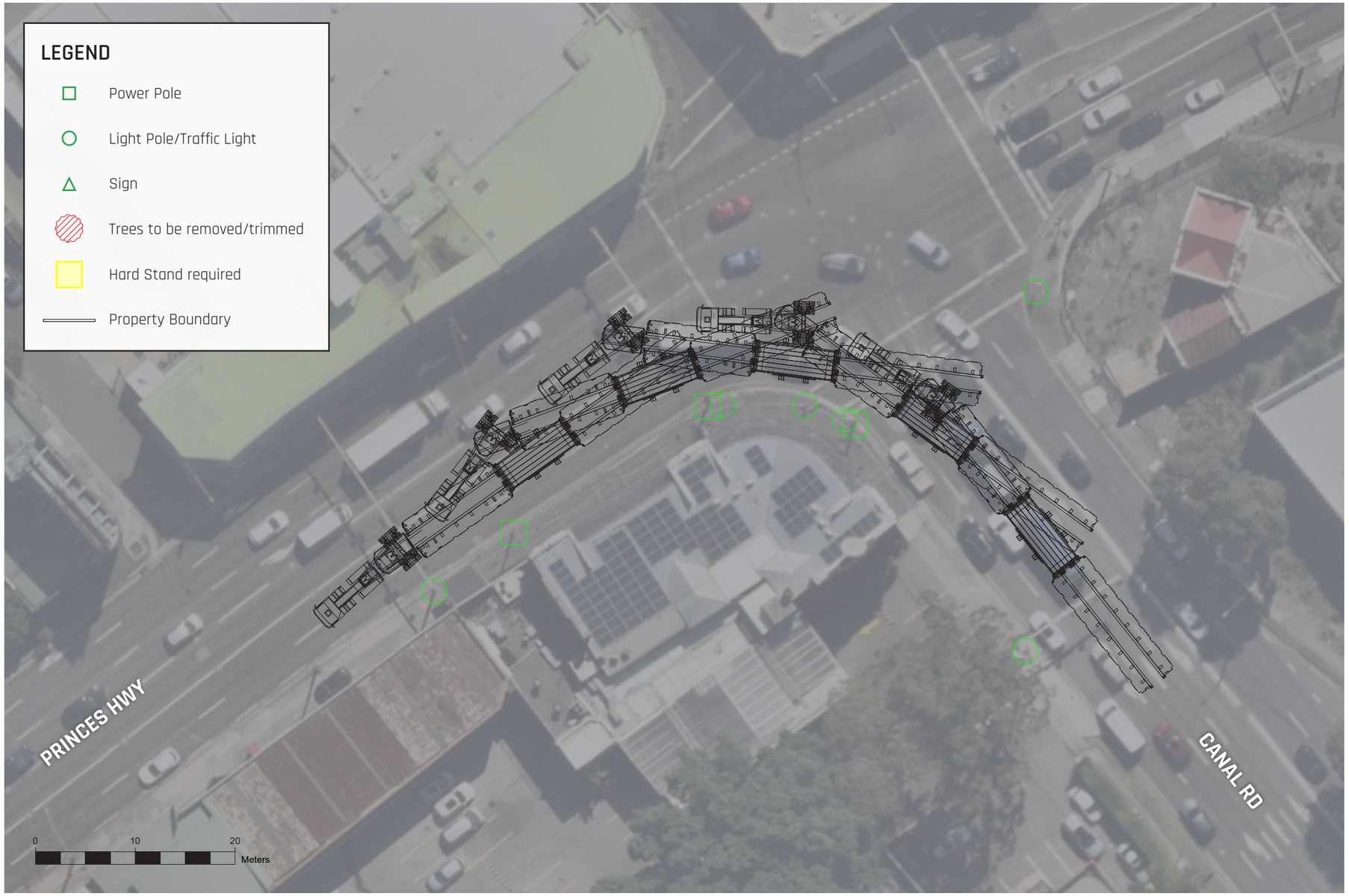
05

LEFT TURN
Canal Rd &
Princes Hwy

ROUTE 1

The left turn onto Princes Hwy at St Peters will require the transport combination to turn into the opposing lanes temporarily. The rear of the trailer will also swing into the opposite lanes on Canal Rd when turning.

Police escorts will need to control traffic during the turn. No modifications are required.



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DRAWING NAME:	Route Survey	REV

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Pinch Point

06

RIGHT TURN

Forest Rd & Stoney Creek Rd

ROUTE 1

The right turn onto Stoney Creek Rd is relatively shallow and will not require any modifications.

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Pinch Point

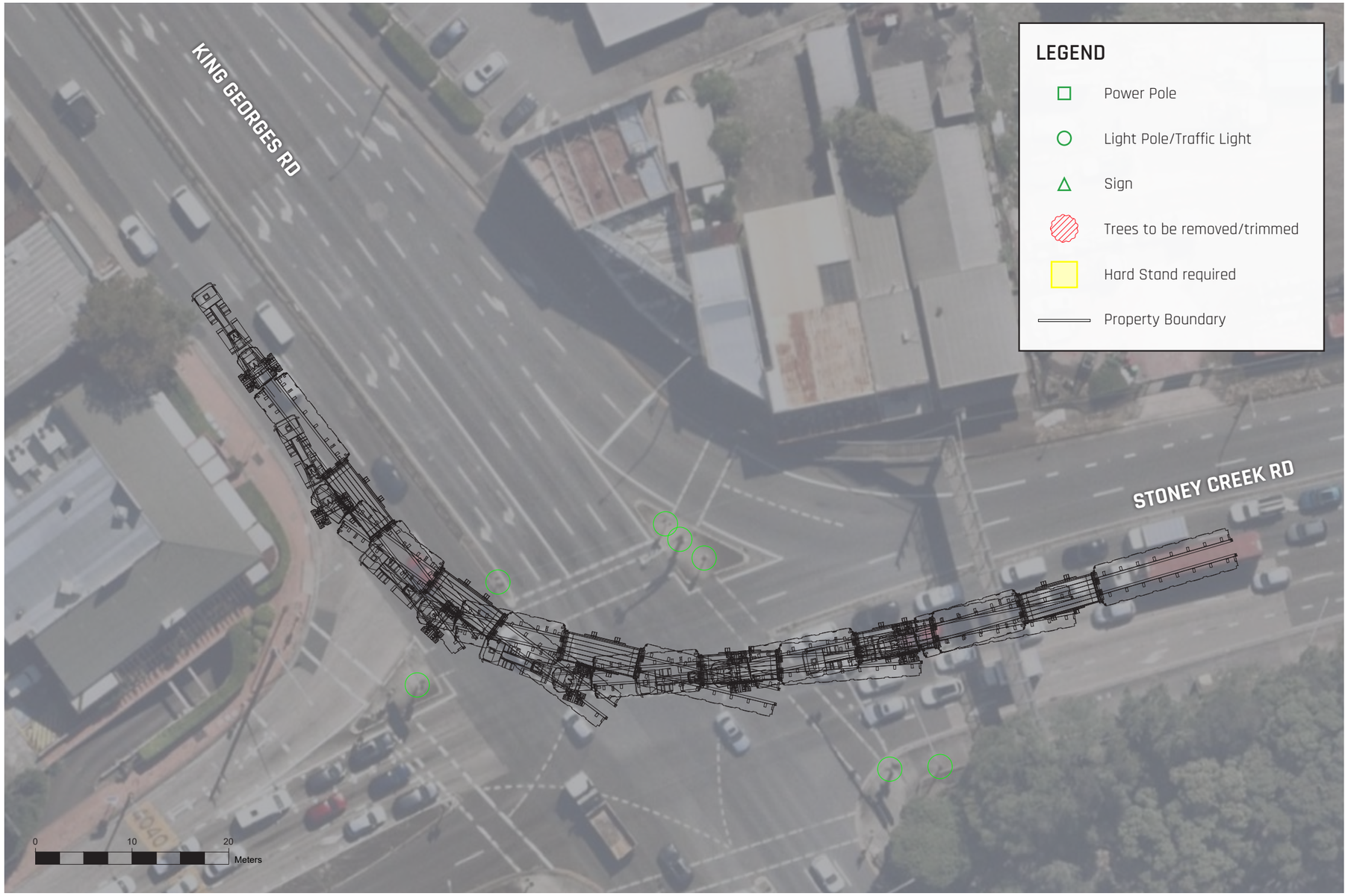
07

RIGHT TURN

Stoney Creek Rd & King Georges Rd

ROUTE 1

This turn is very wide with multiple lanes and can be taken with no modifications.



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Pinch Point

08

LEFT TURN
King Georges Rd
& M5 Mwy

ROUTE 1

The trailer can use the existing slip lane to turn onto the M5 onramp. The rear of the trailer will mount the concrete traffic island. No modifications are required.

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ARES GROUP - L1.05, 480 ST KILDA RD, MELBOURNE VIC 3004

Pinch Point

09

LEFT TURN
Sydney Rd
& Union St

ROUTE 1

In east Goulburn, the load will need to take a left turn into Union St. A traffic light in the central median will need to be relocated, along with a road sign. The trailer will need to use the full width of the road when turning to avoid traffic lights and light poles on the inside of the corner. Police escorts will need to control traffic on Union St while the load turns.

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Pinch Point

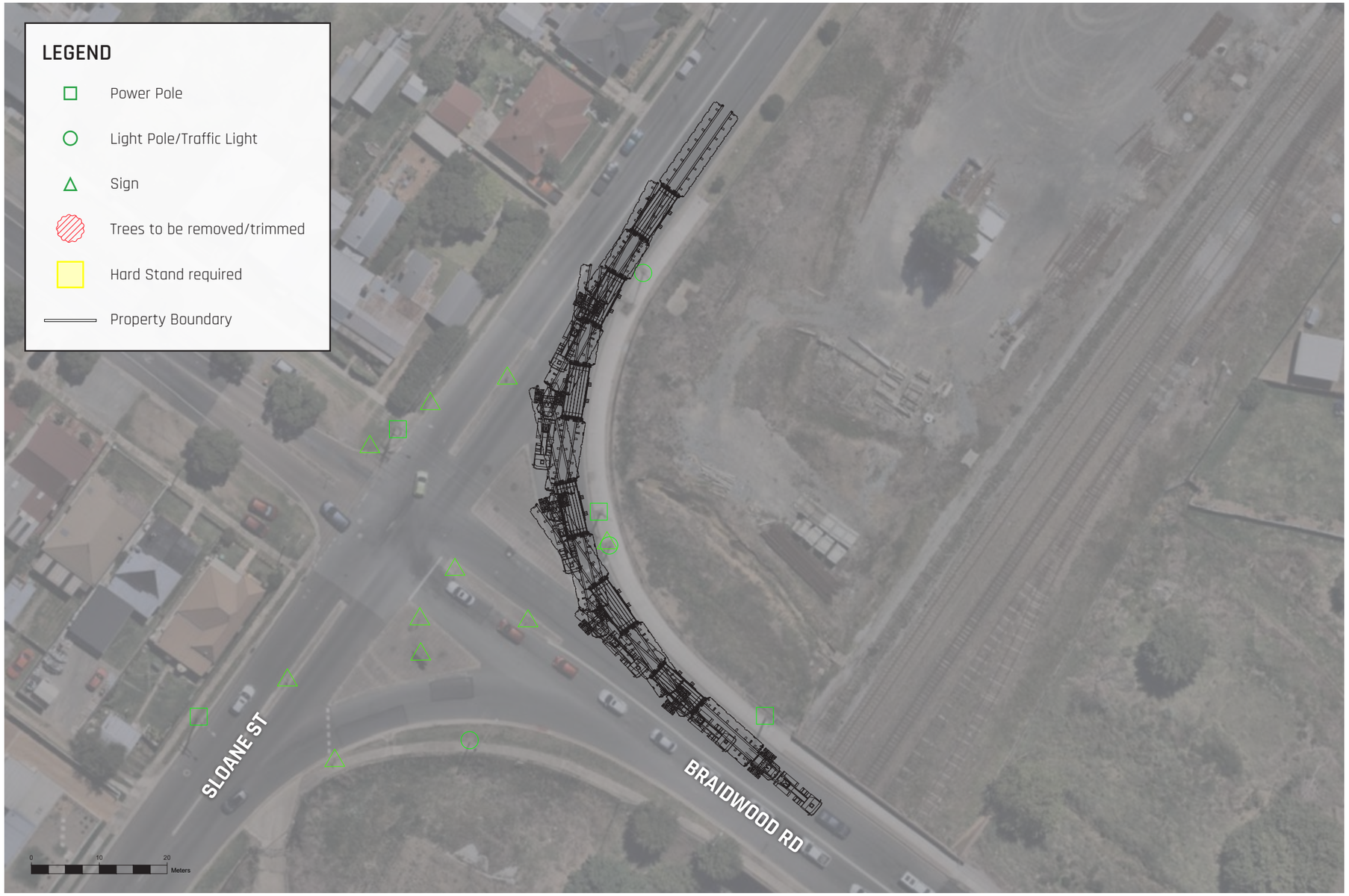
10

LEFT TURN

Sloane St &
Braidwood Rd

ROUTE 1

This turn onto Braidwood Rd poses no issues for the transformer load. The rear of the trailer will mount the concrete traffic island but no modifications are required.



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Pinch Point

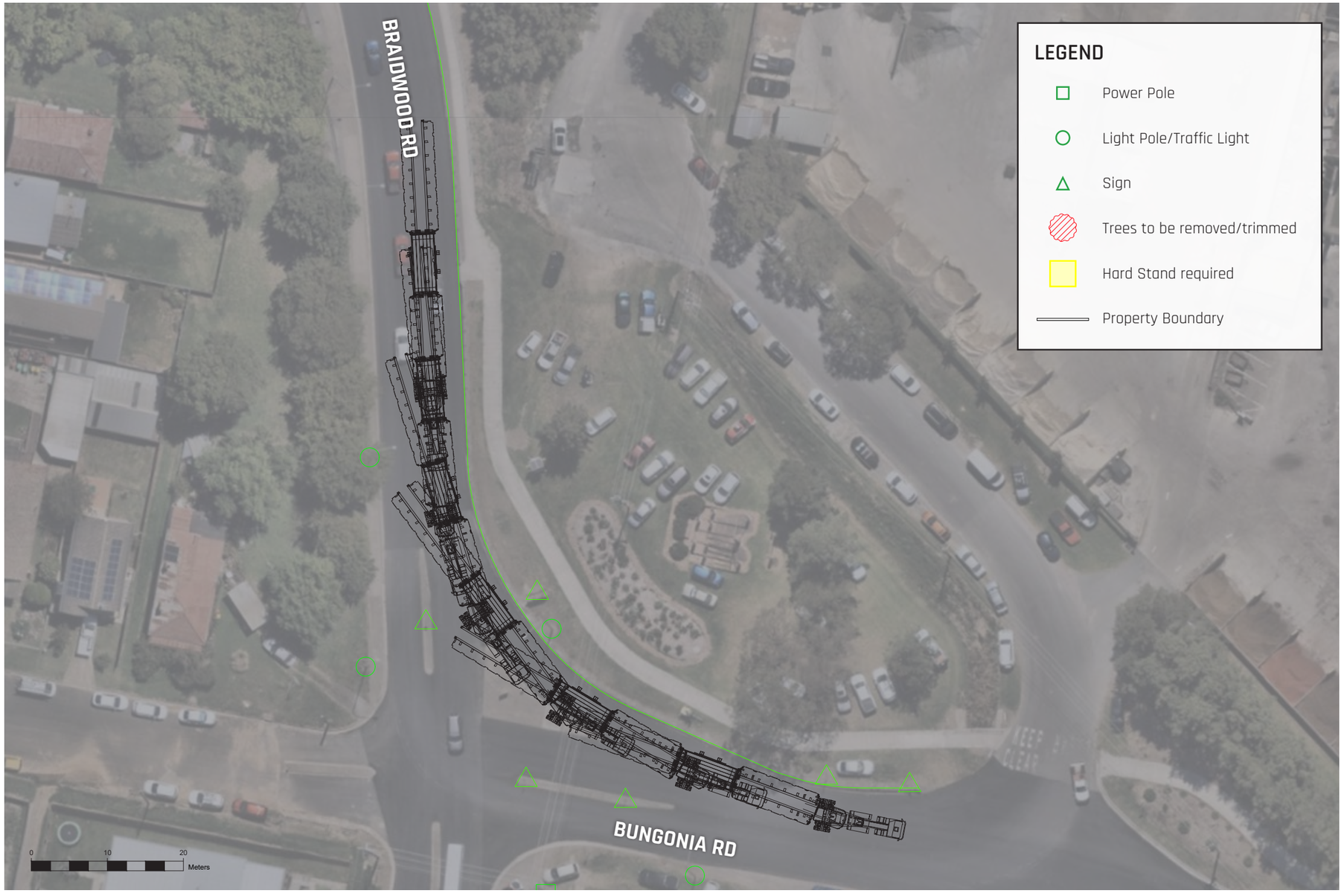
11

LEFT TURN

Braidwood Rd
& Bungonia Rd

ROUTE 1

The transformer can turn into Bungonia Rd with no modifications required. The rear of the trailer will swing into the opposite lane on Braidwood Rd and also mount the traffic island, which will require police escorts to control northbound traffic.



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ARES GROUP - L1.05, 480 ST KILDA RD, MELBOURNE VIC 3004

Pinch Point

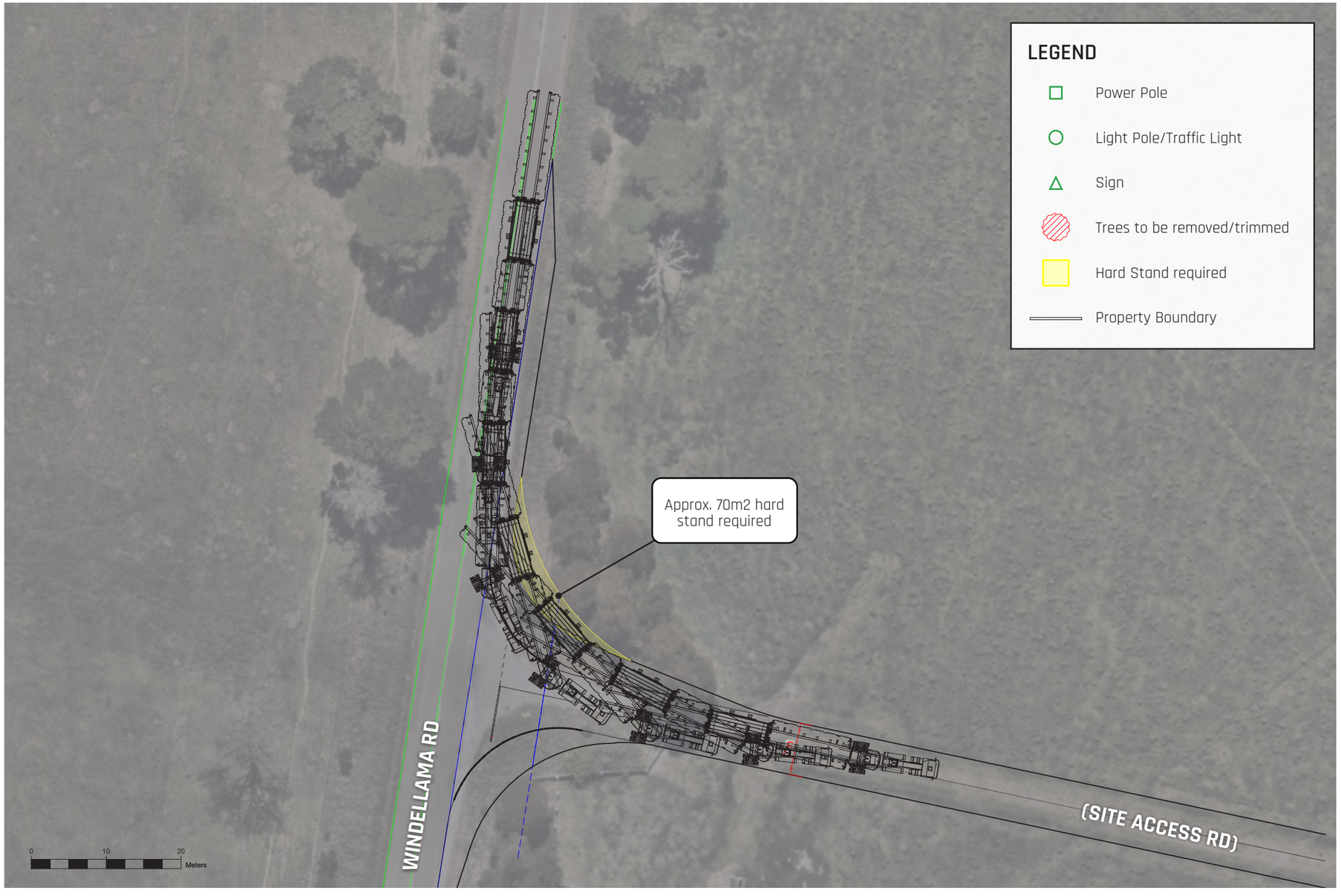
12

LEFT TURN
Windellama Rd
& Site Entrance

ROUTE 1 **ROUTE 2**

The turn into the site access road for the project will be upgraded for general heavy vehicle traffic. The current design has been overlaid on the aerial imagery to the right and assessed for swept path requirements for the OSOM transformer trailer.

As shown, some additional widening of the inside of the corner is required to accommodate the transformer delivery. We understand that the trees on the inside of the corner will be removed as part of the site entrance design so they should not cause any issues.



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03

Route 2 - Port Kembla to Gundary SF

Route 2 Overview

ROUTE 2

	START - Port Kembla
0.0 KM	Tom Thumb Rd
0.3 KM	Springhill Rd
1.4 KM	Masters Rd
2.2 KM	M2 Princes Mwy
13.7 KM	Picton Rd
40.5 KM	M31 Hume Mwy
161.4 KM	Hume St
161.6 KM	Garroorigang Rd
163.4 KM	Sloane St
165.0 KM	Braidwood Rd
165.3 KM	Bungonia Rd
166.8 KM	Windellama Rd
174.8 KM	**FINISH - Gundary SF**

NHVR Route ID: 20JJ7-2 v2

Note 1: The return journey is expected to be the reverse of the above.

Note 2: Components may also take this option - refer to Route 1 and Pinch Points 09-11. This is the preferred option to take components through Goulburn and Pinch Points 17-20 have only been assessed for completeness.

INTERACTIVE MAP LINK

Pinch Point

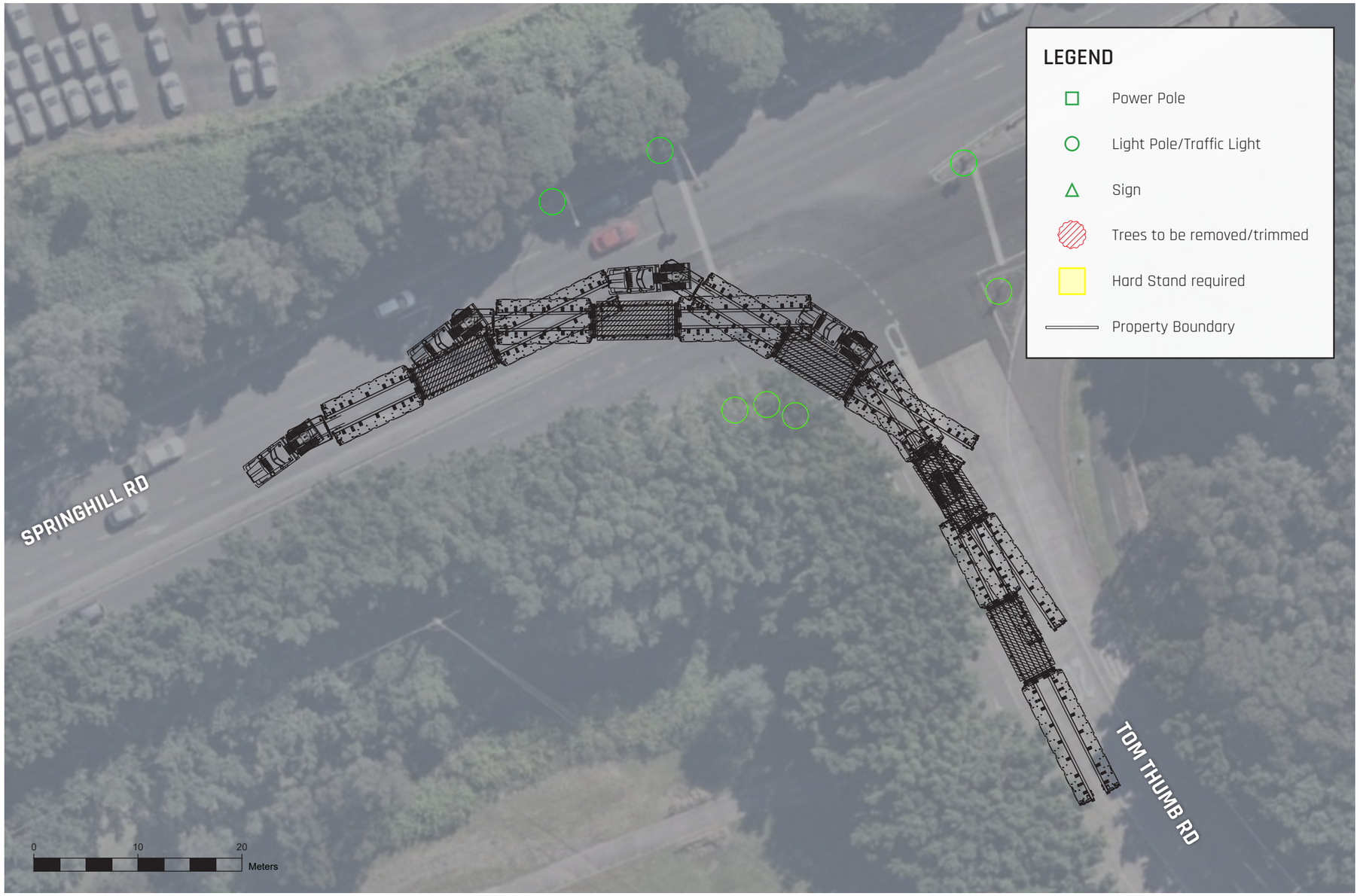
13

LEFT TURN

Tom Thumb Rd
& Springhill Rd

ROUTE 2

The OSOM load will exit the Port of Port Kembla via Tom Thumb Rd then turn onto Springhill Rd. The turn is wide and can be done with no modifications, although the length and width of the combination means that the load will need to use the opposing lanes to make the turn. Police escorts will need to control and manage traffic whilst the turn is being taken.



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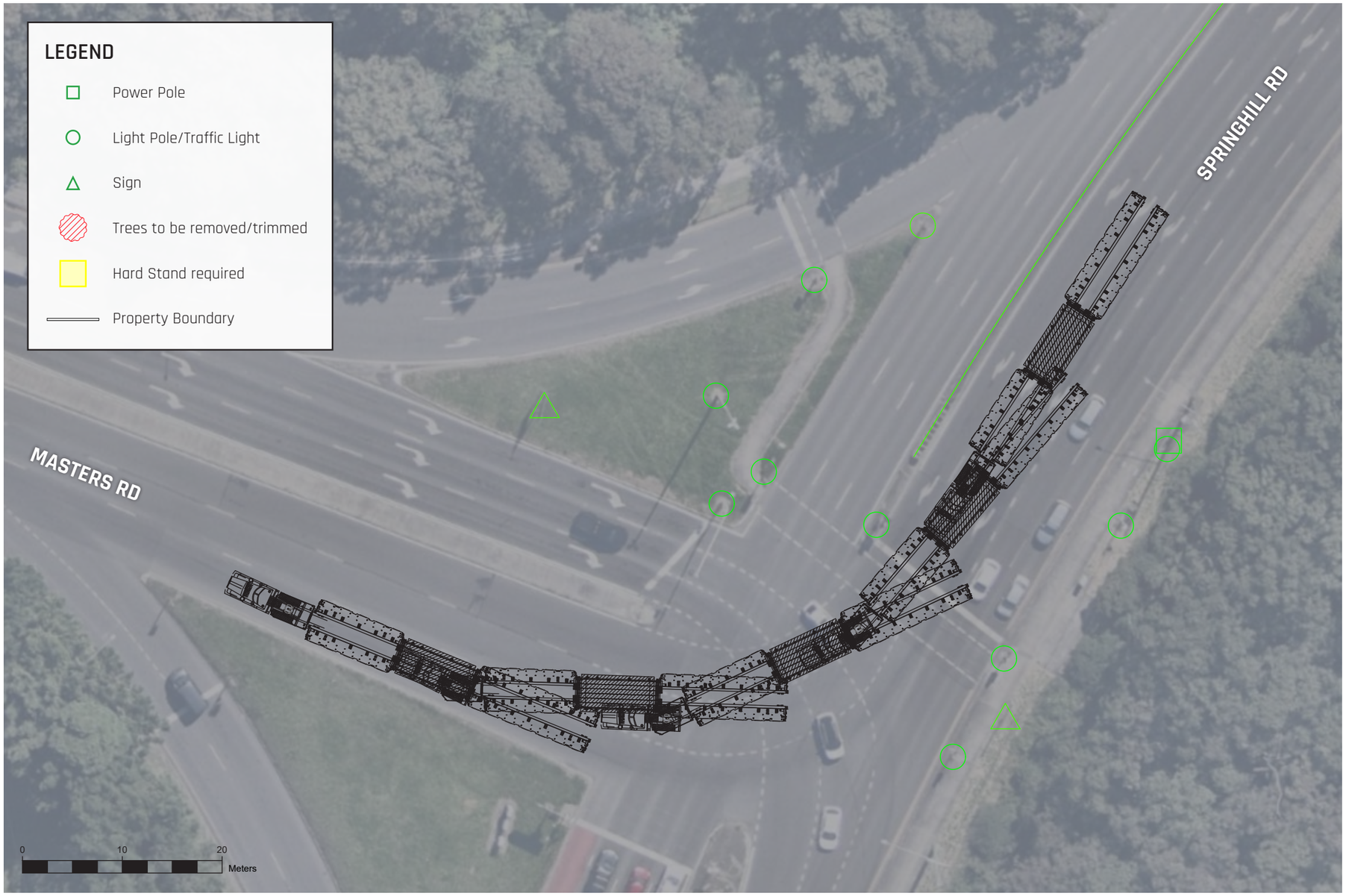
Pinch Point

14

RIGHT TURN
Springhill Rd
& Masters Rd

ROUTE 2

The right turn onto Masters Rd is very wide with multiple turning lanes. The transformer combination will have no issues making this turn with no modifications.



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Pinch Point

15

LEFT TURN

M1 Motorway
& Picton Rd

ROUTE 2

The transformer load will be able to take the slip lane onto Picton Rd with no issue. The rear of the trailer will mount the traffic island but it is trafficable and will cause no issues.

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Pinch Point

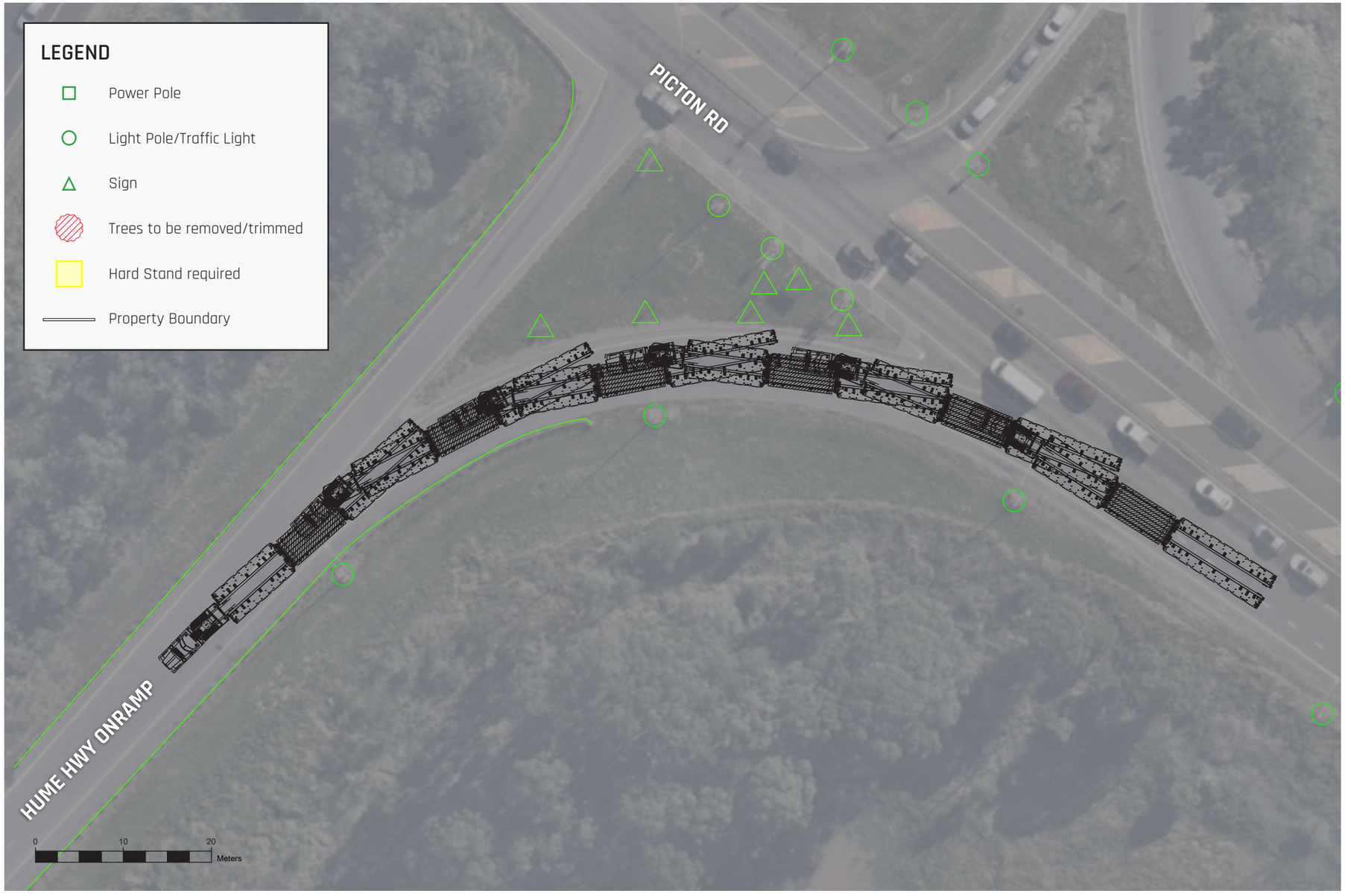
16

LEFT TURN

Picton Rd &
Hume Hwy

ROUTE 2

Likewise, there is a generous slip lane to get onto the Hume Hwy from Picton Rd and the transformer combination will have no issues making this turn.



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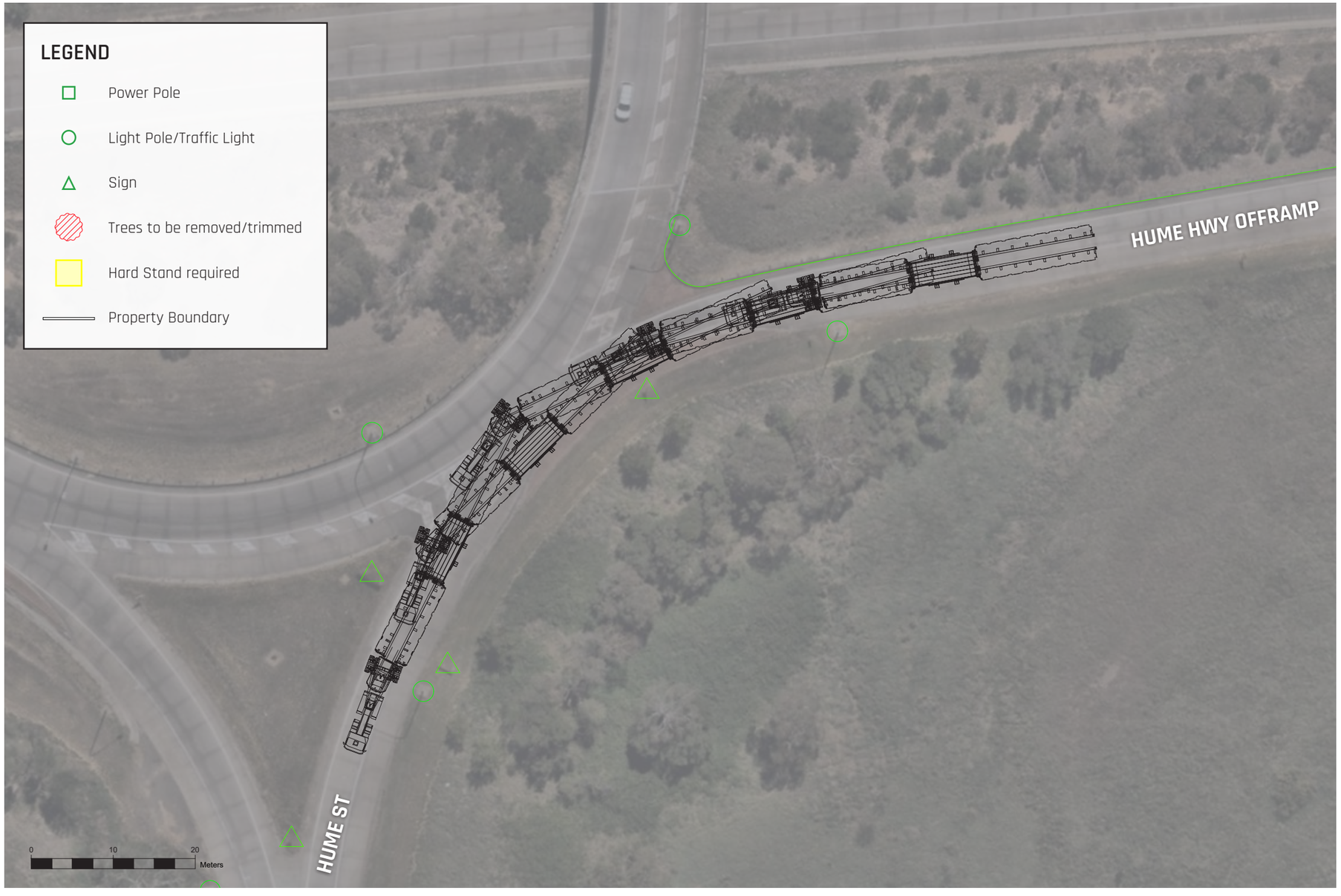
Pinch Point

17

LEFT TURN
Hume Hwy &
Hume St

ROUTE 2

The turn off the Hume Hwy south west of Goulburn is very wide and will require no modifications.



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Pinch Point

18

LEFT TURN

Hume St &
Garroorigang Rd

ROUTE 2

Loads will need to turn left at the end of Hume St. No modifications are required, but the load will need to use the full width of Garroorigang Rd to turn, and the rear of the trailer will also require the full width of Hume St. Care will need to be taken to avoid impacting the culvert, especially with the rear of the trailer.

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Pinch Point

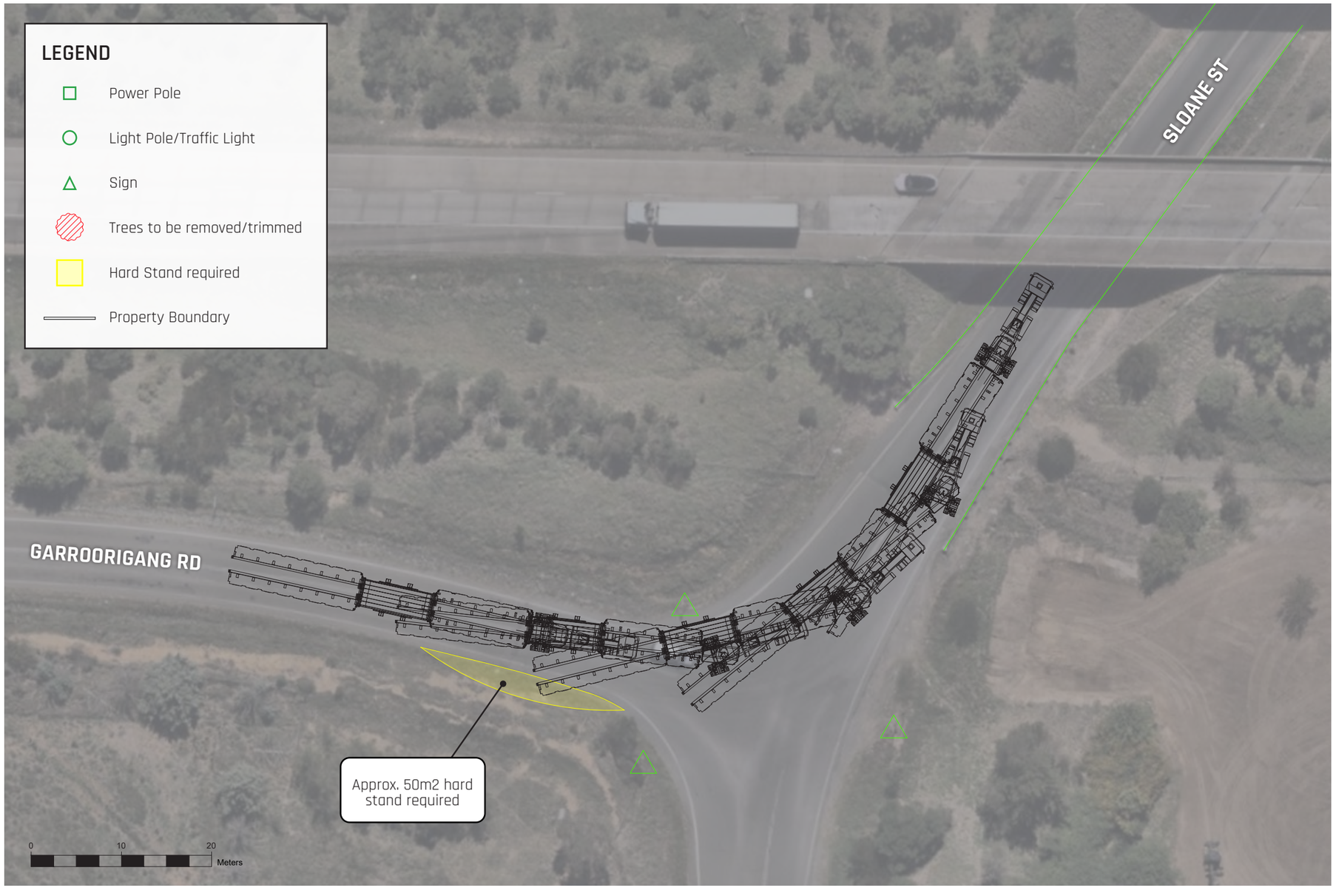
19

LEFT TURN
Garroorigang Rd
& Sloane St

ROUTE 2

This turn onto Sloane St can be negotiated by the trailer with the addition of some hard stand on the south side of Garroorigang Rd. The trailer will need to avoid the inside of the corner as there is an embankment.

Police escorts will need to control traffic on Sloane St to allow the truck and trailer to swing out wide to avoid the inside.



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Pinch Point

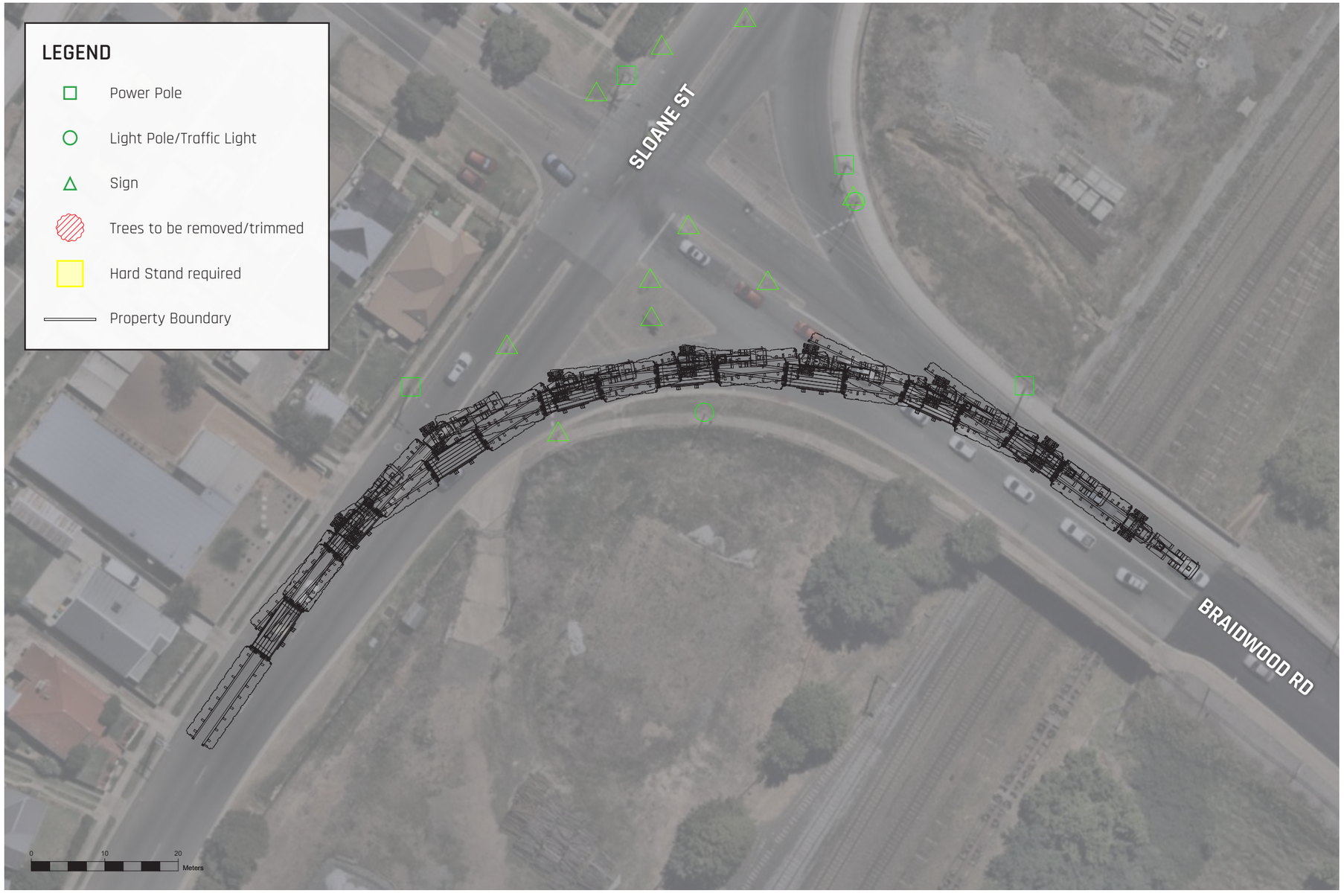
20

RIGHT TURN

Sloane St &
Braidwood Rd

ROUTE 2

This right turn can be taken with no modifications, with the trailer required to contraflow using the opposing slip lane. Police escorts will be required to control traffic on both streets while the contraflow takes place.



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04

Conclusion

Conclusion

A brief outline of the report's major findings and any recommendations for actions.

> **...transport of OSOM components to Gundary SF is feasible.**

Summary

Following our desktop survey and analysis, ARES believe that transport of the oversize overmass (OSOM) components for the Gundary SF project from the ports of **Port Botany** and **Port Kembla** is feasible along the proposed transport routes, with only minor modifications required to make the route suitable for the OSOM load for the project, which is a 170-ton transformer.

There are no issues with using either port to receive the cargo. Both are capable of receiving a large break-bulk component such as a transformer and both have berthside or near-berth storage options available should they be required.

The routes from each port use roads on the approved NSW Oversize Overmass Load Carrying Vehicles Network map, which are commonly used to take OSOM components out of either Sydney or Wollongong and onto the Hume Hwy. From the Hume Hwy at Goulburn, there are two options to get onto Windellama Rd - a northern and a southern option, both of which have been assessed. The northern option requires the relocation of one traffic light in Goulburn. The southern option is slightly easier but deviates off the OSOM Load Carrying Vehicles network.

The main challenge for transport is the height of the transformer. At 4.2m high, the only way to take this load out of either Port is to use a specialised drop frame solution or a beam set, which would add a lot of mass and complexity to the transport job. We have proposed the use of the drop frame to keep risk and complexity to a minimum.

The project site has a single proposed access point off Windellama Rd south of Goulburn. The turn into this access point was assessed for swept path and found to be suitable with minor modifications.

Next Steps

Based on the findings in this route survey, we recommend the following actions:

- Initiate dialogue with TfNSW regarding timing of major upgrade projects and any impacts, especially the Mount Ousley Interchange project
- Confirm final choice of Port and route
- Confirm final weights and dimensions of selected transformer
- Conduct a physical survey of the route to validate the results of this desktop survey closer to transport date

Summary of Road Modifications

The following table lists all required modifications to allow transport of components to take place.

Pinch Point	Route	Road/Intersection	Modifications Required	Risk
09	1	Sydney Rd & Union St	1x traffic light to be relocated, 1x sign to be made remove-able	Medium
12	1&2	Windellama Rd & Site Entrance	Temporary hardstand to be laid down (approx. 70m2)	Low
19	2	Garroorigang Rd & Sloane St	Temporary hardstand to be laid down (approx. 50m2)	Low

Risk Ratings: Low - minor modifications such as signs or minor civils only.
Medium - moderate works including civils and removal of power and lighting assets.
High - requires 3rd party stakeholder input/approvals, or large scope of upgrades

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Appendix G

Strategic Intersection Designs

Technical Note – Gundry Solar Farm OSOM – Strategic Intersection Design

Project Number	**N25181**
Client	**Umwelt**
Date	**16 December 2025**
Document Number	**N25181-TN-0001**
Revision	**B**
Prepared By	**Isabella McMahon**
Reviewed By	**Ben Collyer**
Approved By	**Ben Collyer**

1 Executive Summary

BG&E was engaged by Umwelt to prepare a Strategic Intersection Design for Oversize Over Mass (OSOM) transport movements associated with the Gundary Solar Farm project. The largest OSOM component is the delivery of the main transformer from Port of Botany to the project site near Goulburn, NSW. ARES Group prepared an OSOM route study for Umwelt for the purposes of discussions with Transport for NSW (TfNSW), and this study was the basis for developing further investigation, informing this Route Strategic Intersection Design

ARES Group identified twelve pinch points along the preferred route where state road infrastructure would be impacted. Following from the OSOM Route study, four of the pinch points were identified as 'critical' pinch points, requiring further investigation. This study assessed each of the four locations using aerial imagery, Before You Dig Australia (BYDA) data, and conservative swept path modelling of the design vehicle.

Critical Pinch Points include:

- **Pinch Point 1 (Botany Road/Bumborah Point Road):** Requires removal of ~167 m² of medians and temporary pavement installation, with clearance checks for streetlights and overhead power lines.
- **Pinch Point 2 (Botany Road/Bunnerong Road):** Requires ~145 m² of kerb/median modifications, temporary pit adjustments, and clearance checks for multiple overhead powerlines.
- **Pinch Point 3 (Kent Road/Gardeners Road):** Requires ~86 m² of kerb/median modifications, temporary pit reconfiguration, and clearance checks for overhanging signage and VMS structures.
- **Pinch Point 11 (Braidwood Road/Bungonia Road):** Requires ~57 m² of median removal and clearance checks for a single overhead power line.

Across all pinch points, traffic control measures and temporary pavement reinstatement will be essential. Clearance assessments for overhead structures and power lines are recommended prior to transport.

2 Introduction

BG&E have been engaged by Umwelt to conduct an OSOM Strategic Intersection Design for four (4) critical Pinch Points in which state road infrastructure may be impacted. TfNSW identified the following medians would be impacted following the revision of the ARES Route Study from Port of Botany (Route 1):

- Median on Botany Road being crossed to make turn onto Bumborah Point Road (Pinch Point 1)
- Median at the corner of Bunnerong Road and Botany Road on Bunnerong Road (Pinch Point 2)
- Median on Kent Road being crossed to make turn (Pinch Point 3)

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- Median at Corner of Braidwood Road and Bungonia Road (Pinch Point 11)

The following Strategic Intersection Design and associated concept drawings will identify the roadside assets, kerbs and medians that shall be affected by the turning path of the design vehicle and provide advice on the locations of required temporary pavement and anticipated roadside asset removal. This assessment has been undertaken as a desktop study only, relying on existing aerial imagery and Before You Dig Australia (BYDA) information.

3 Background Information

Lightsource Development Services Australia Pty Ltd (Lightsource BP) is proposing the development of the Gundary Solar Farm, located within the Goulburn Mulwaree Local Government Area (LGA), approximately 10 km southeast of Goulburn in the Southern Tablelands region of New South Wales.

The Project will cover an area of approximately 702 hectares (ha) and shall involve the construction, operation, maintenance and decommissioning of a solar photovoltaic (PV) generation facility with a peak capacity of approximately 400 megawatts (MW). Key components will include a Battery Energy Storage System (BESS), an onsite substation/switching station, connection to an existing 330 kilovolt (kV) transmission line, and associated ancillary infrastructure.

Under the State Environmental Planning Policy (Planning Systems) 2021, the Project has been classified as a State Significant Development (SSD) due to its capital investment value exceeding $30 million and its purpose of electricity generation. A scoping report was submitted in September 2022 to the then Department of Planning and Environment (DPE), now the Department of Planning, Housing and Infrastructure (DPHI).

Following this submission, the Secretary's Environmental Assessment Requirements (SEARs) were issued, outlining the matters to be addressed within the Environmental Impact Statement (EIS) to be prepared by Umwelt. Traffic and transport considerations were identified as one of the key issues requiring detailed assessment.

To support this, Umwelt engaged ARES to undertake a Route Survey for the largest Oversize Over Mass (OSOM) component of the project, the main transformer. The survey assessed the transportation routes from the Port of Botany in Sydney and Port Kembla in Wollongong to the project site, identifying potential pinch points and providing estimates of the modifications and works required to enable safe delivery.

Following this review, TfNSW identified four (4) pinch points from the preferred Port of Botany Route, in which road structures would be impacted. These include the intersections of Botany Road and Bumborah Point Road (Pinch Point 1), Bunnerong Road and Botany Road (Pinch Point 2), Kent Road and Gardeners Road (Pinch Point 3), and Braidwood Road and Bungonia Road (Pinch Point 11).

TfNSW has advised that it will not support high-risk OSOM movements traversing road infrastructure without appropriate mitigation. Accordingly, TfNSW recommends that the revised Traffic Impact Assessment (TIA) incorporate strategic concept designs to define the scope of roadworks, pavement strengthening, and/or modifications required to the state road infrastructure (e.g. roundabouts, medians, traffic islands, pedestrian refuges) at all locations where swept path analysis indicates high-risk OSOM vehicles would impact the network.

4 Methodology

The largest OSOM component of the project was identified to be the delivery of the one-off main transformer. The load and design vehicle will be accompanied two (2) oversize pilot vehicles and travel under NSW police escort. Passage will primarily occur at night when traffic is expected to be minimal. The exact dimensions and weights of the load is yet to be finalised; therefore, the assumptions provided in the ARES Route Assessment were used for the purpose of this Strategic Intersection Design. Assumed cargo dimensions are shown in Table 1.

Table 1 Assumed cargo dimensions

Length (m)	9.95

Width (m)	3.33
Height (m)	4.2
Weight (tonnes)	170

Combined vehicle and cargo dimensions are given in Table 2.

Table 2 Assumed overall OSOM Vehicle dimensions

Length (m)	47.5
Width (m)	4.3
Height (m)	4.8
Gross Combination Mass (tonnes)	295
Mass per axle (tonnes)	17

The OSOM vehicle was modelled using the design vehicle information supplied in the ARES Route Assessment, with the given information. Truck and trailer dimensions were measured from the equipment schematic provided, as shown in Figure 1; and dolly and trailer tyre size is assumed to be 215/75 R17.5 as per guidance received from Umwelt.

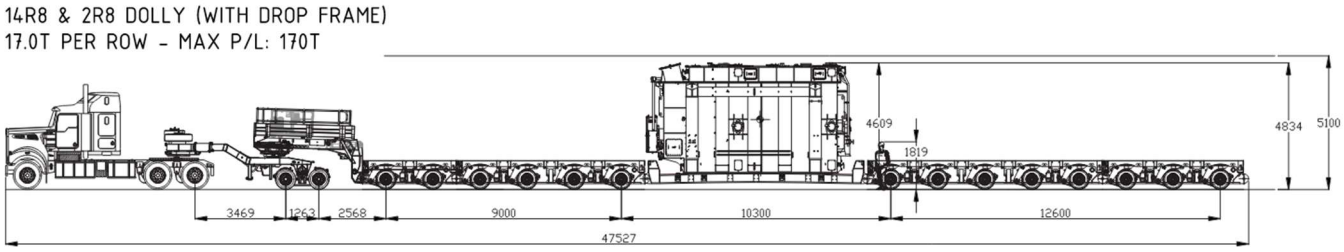

Figure 1 OSOM Vehicle Schematic (ARES)

The Prime Mover is based on the Kenworth C509, which appears to match the vehicle shown in the ARES route assessment. The standard turning angle for the front axle is set conservatively to 45 degrees, however, may be increased up to 55 degrees according to the Kenworth C509 specification sheet. Articulation angles in either direction for the dolly and the trailer are assumed to be 45 degrees and tyre size 11R22.5, as per guidance received from Umwelt. The model does not consider the intervention of an oversize pilot vehicle, operating from the rear.

Detailed survey was not provided, therefore identified aboveground roadside assets (such as streetlights, traffic lights, traffic signs, etc.), kerbs and medians were digitised using NEARMAP imagery, GOOGLE maps and BYDA information prior to conducting the turning path assessment. A 0.3 m buffer was implemented around identified roadside assets to ensure clearance. The turning path of the design vehicle was assessed at a speed of less than 15 km/hr, utilising 'turn on spot' (0 km/hr) where particularly tight turns were necessary.

Assumptions on road quality, bridges and culverts, overhead structures and overhead power lines replicate those described in the General Route Notes as described by ARES; these are summarised in Table 3.

Table 3 Assumptions

Road Quality	Bridges and Culverts	Overhead Structures	Overhead Power Lines
Transport route is primarily along NSW state motorway and highway network, which is typically designed with the	Structures on state roads and highways are not of concern as they should be	Numerous low structures, with a minimum of 5.1 m clearance were observed when exiting Sydney and along the Hume Highway.	Travel height below approximately 5.5 m is not generally an issue with respect to power lines. However, loads

ability to manage higher loads and traffic volumes	designed to manage heavy vehicle loads.		above 4.6 m travel height will require a high load permit from the power authorities prior to travel.
The route will be fully paved up to the site access road.	Bridge assessments will be required from TfNSW or relevant asset owners where bridges may be crossed by the vehicle.	The route taken out of Sydney is a common OSOM corridor and heights are well documented.	An overhead power line survey is recommended to be conducted closer to the date of transport to confirm clearance.
The route remains exclusively within the approved NSW OSOM Load Carrying Vehicle Network, deviating only upon reaching the Bungonia Road/Windellama Road section into site.		The transport solution from ARES allows the transformer to be transported at a height of 4.8 m, allowing the load to pass under low structures.	

5 Assessment and Outcomes

5.1 Pinch Point 1

A schematic of the assessed turning path, including all identified roadside assets and proposed temporary pavement areas for Pinch Point 1 is demonstrated in Figure 2.

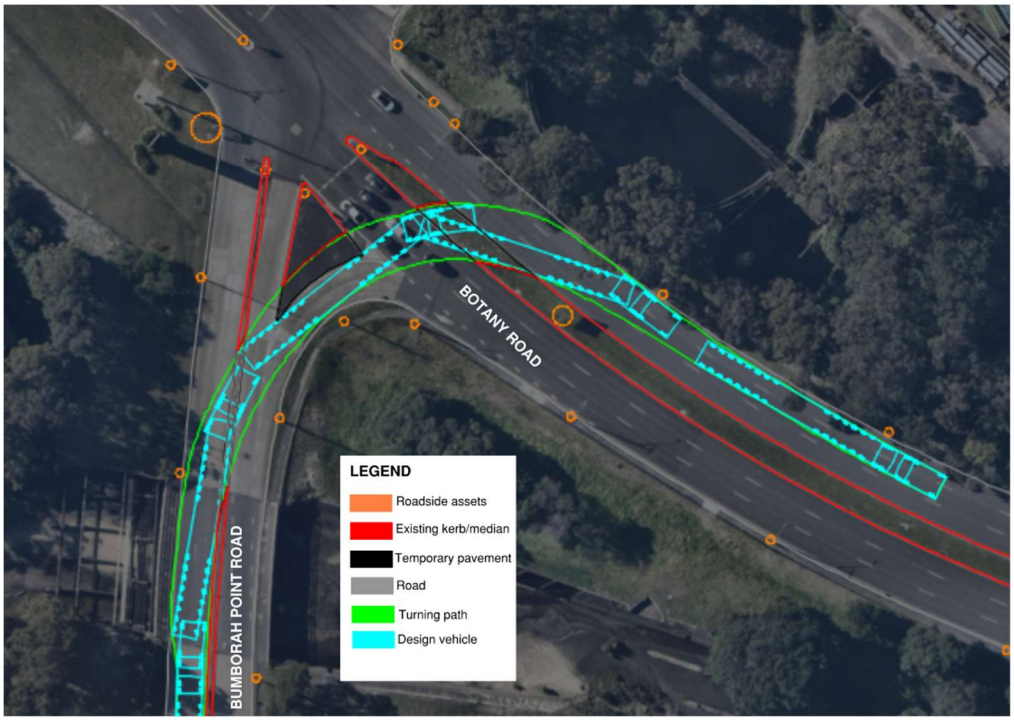

Figure 2 Schematic of Pinch Point 1

The design vehicle begins the turn in the northbound direction on Bumborah Point Road, crossing the bridge. It is assumed that the bridge does not require any loading checks.

To facilitate the design vehicles passage, sections of the medians must be cut and replaced with temporary pavement as follows:

- Bumborah Point Road: ~ 31 m²
  - Note: the design vehicle shall operate against design traffic flow as the vehicle overtops the median strip
- Botany Road: ~ 76 m²
  - Note: the design vehicle shall operate against design traffic flow as the vehicle overtops the median strip
- Triangular splitter island at the intersection: ~ 60 m²

The design vehicle will pass beneath overhanging streetlights and a single overhead power line along both Bumborah Point Road and Botany Road. As the vertical clearance of these structures is currently unknown, it is recommended that a clearance assessment be undertaken to confirm suitability for passage.

5.2 Pinch Point 2

The design vehicle begins the turn in the eastbound direction on Botany Road. A schematic of the assessed turning path, including all identified roadside assets and proposed temporary pavement areas for Pinch Point 2 is demonstrated in Figure 3.

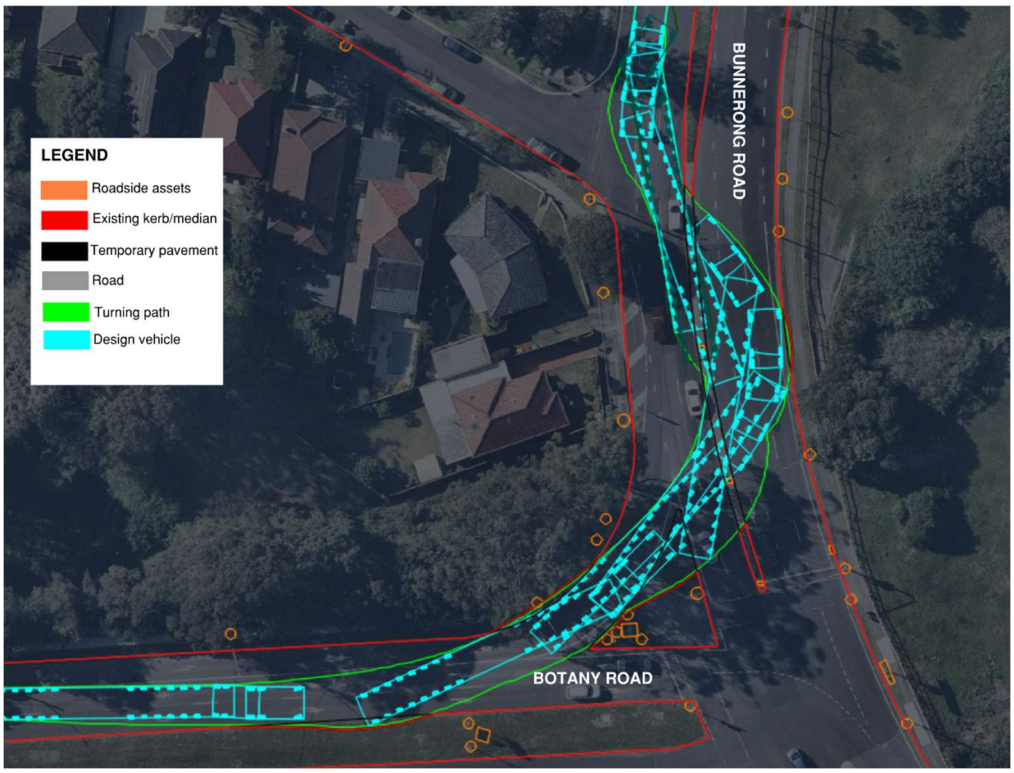

Figure 3 Schematic of Pinch Point 2

To facilitate the passage of the design vehicle, sections of the kerbs and medians must be cut and replaced with temporary pavement according to the relevant typical sections as follows:

- Median strip on Botany Road: ~ 20 m^2
- Triangular splitter island at the intersection: ~ 50 m^2
- Kerb at the intersection: ~ 13 m^2
- Median strip on Bunnerong Road: ~ 59 m^2
  - Note: Two (2) pits will require temporary modification in the removal process of this section of the median strip

    - Note: Operation against design traffic flow will occur as the vehicle overtops the median strip
- Kerb on Bunnerong Road: ~ 4 m^2

Potential risk to roadside assets has been identified at two (2) locations at the intersection.

Road kerb:

- One (1) traffic light
- One (1) power pole

Triangular splitter island:

- One (1) security camera
- One (1) solar panel
- One (1) traffic light

Removal of these assets may not be necessary due to the conservative nature of the design vehicle and turning path.

Multiple overhead powerlines were identified on both Botany Road and Bunnerong Road. As the vertical clearance of these are currently unknown, it is recommended that a clearance assessment be undertaken to confirm suitability of passage.

The ARES route assessment appears to have incorrectly drawn the location of the traffic light and power pole adjacent to the kerb that intersects Botany Road and Bunnerong Road. Subsequently, the corridor which the design vehicle must pass through is significantly reduced. Hence, the turning path in this assessment impacts a greater area of road kerbs and medians than previously identified.

5.3 Pinch Point 3

A schematic of the assessed turning path, including all identified roadside assets and proposed temporary pavement areas for Pinch Point 3 is demonstrated in Figure 4.

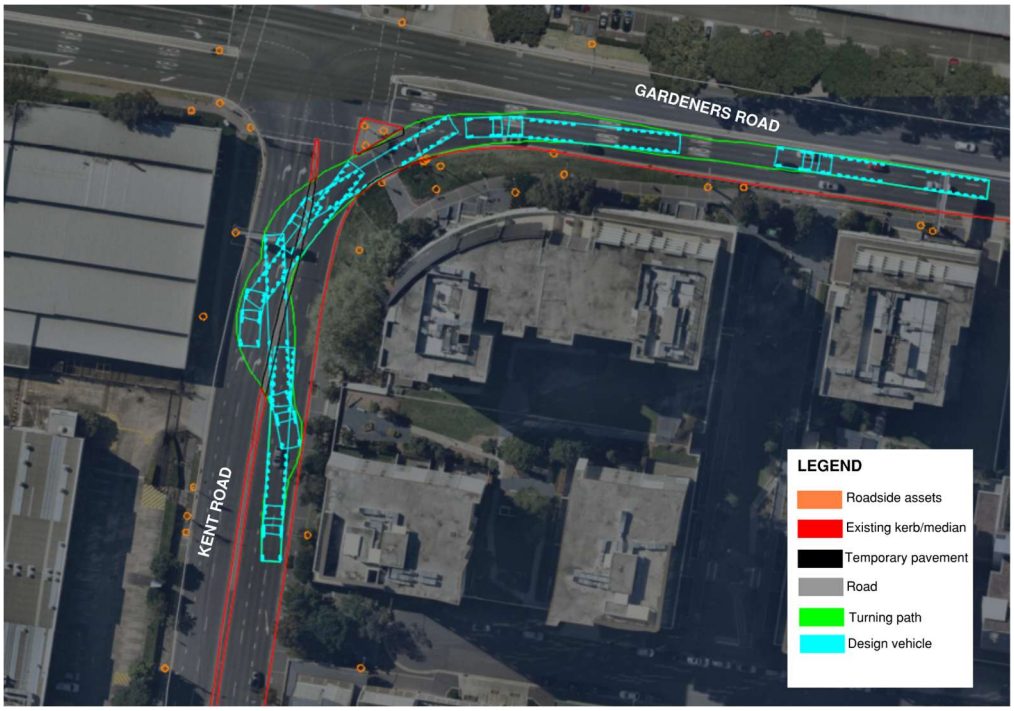

Figure 4 Schematic of Pinch Point 3

To facilitate the passage of the design vehicle, sections of the kerbs and medians must be cut and replaced with temporary pavement according to the relevant typical sections as follows:

- Kerb at intersection: ~ 7 m^2
    - Note: Two pits will be affected in the kerb cut process and shall be temporarily reconfigured
- Triangular median at intersection: ~ 9 m^2
- Median strip on Kent Road: ~ 70 m^2
    - Note: Operation against design traffic flow will occur as the design vehicle passes over the median strip

Potential risk to roadside assets beside the road kerb at the intersection has been identified:

- Two (2) traffic lights
- One (1) road sign

Removal of these assets may not be necessary due to the conservative nature of the design vehicle and turning path.

The design vehicle will pass beneath a large overhanging road sign and two Variable Message Signs (VMS) along this portion of the route. As the vertical clearance of these structures is currently unknown, it is recommended that a clearance assessment be undertaken to confirm suitability for passage.

5.4 Pinch Point 11

A schematic of the assessed turning path, including all identified roadside assets and proposed temporary pavement areas for Pinch Point 11 is demonstrated in Figure 5.

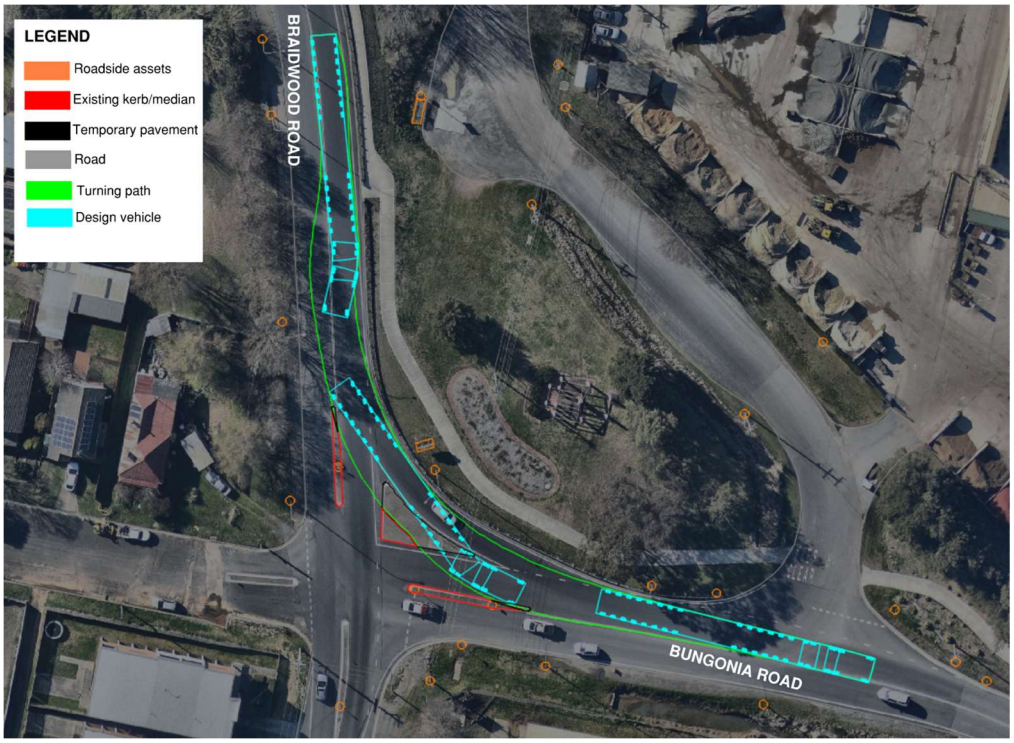

Figure 5 Schematic of Pinch Point 11

To facilitate the passage of the design vehicle, sections of the kerbs and medians must be cut and replaced with temporary pavement according to the relevant typical sections as follows:

- Median strip on Braidwood Road: ~ 2 m²

    - Note: Operation against design traffic flow will occur as the design vehicle passes over the median strip
- Median strip on Bungonia Road: ~ 3 m²
- Triangular median at intersection: ~ 52 m²

The design vehicle will pass beneath a singular overhead power line on Bungonia Road. As the vertical clearance is currently unknown, it is recommended that a clearance assessment be undertaken to confirm suitability for passage.

6 Conclusion

The Gundary Solar Farm OSOM Strategic Intersection Design has identified the specific roadworks and asset modifications required to facilitate safe passage of the main transformer from Port of Botany to the project site.

Four pinch points were assessed, with each requiring targeted kerb and median removals, temporary pavement installation, and clearance verification for overhead structures.

The assessment confirms that, with appropriate traffic management, temporary civil works, and pre-transport clearance checks, the identified route can accommodate the OSOM delivery without permanent adverse impacts to state road infrastructure.

GUNDARY SOLAR FARM
OSOM ROUTE ROAD/PAVEMENT WORKS

LGA: VARIOUS

INFORMATION ISSUE - FOR STRATEGIC DESIGN

LOCALITY PLAN
N.T.S

SOURCE: OPENSTREETMAP

DRAWING INDEX	
DRAWING NUMBER	DESCRIPTION
N25181-DRG-CI-0001	COVER SHEET, LOCALITY PLAN AND DRAWING INDEX
N25181-DRG-CI-0010	PINCH POINT 1 PLAN
N25181-DRG-CI-0020	PINCH POINT 2 PLAN
N25181-DRG-CI-0030	PINCH POINT 3 PLAN
N25181-DRG-CI-0040	PINCH POINT 11 PLAN
N25181-DRG-CI-0050	TYPICAL SECTIONS

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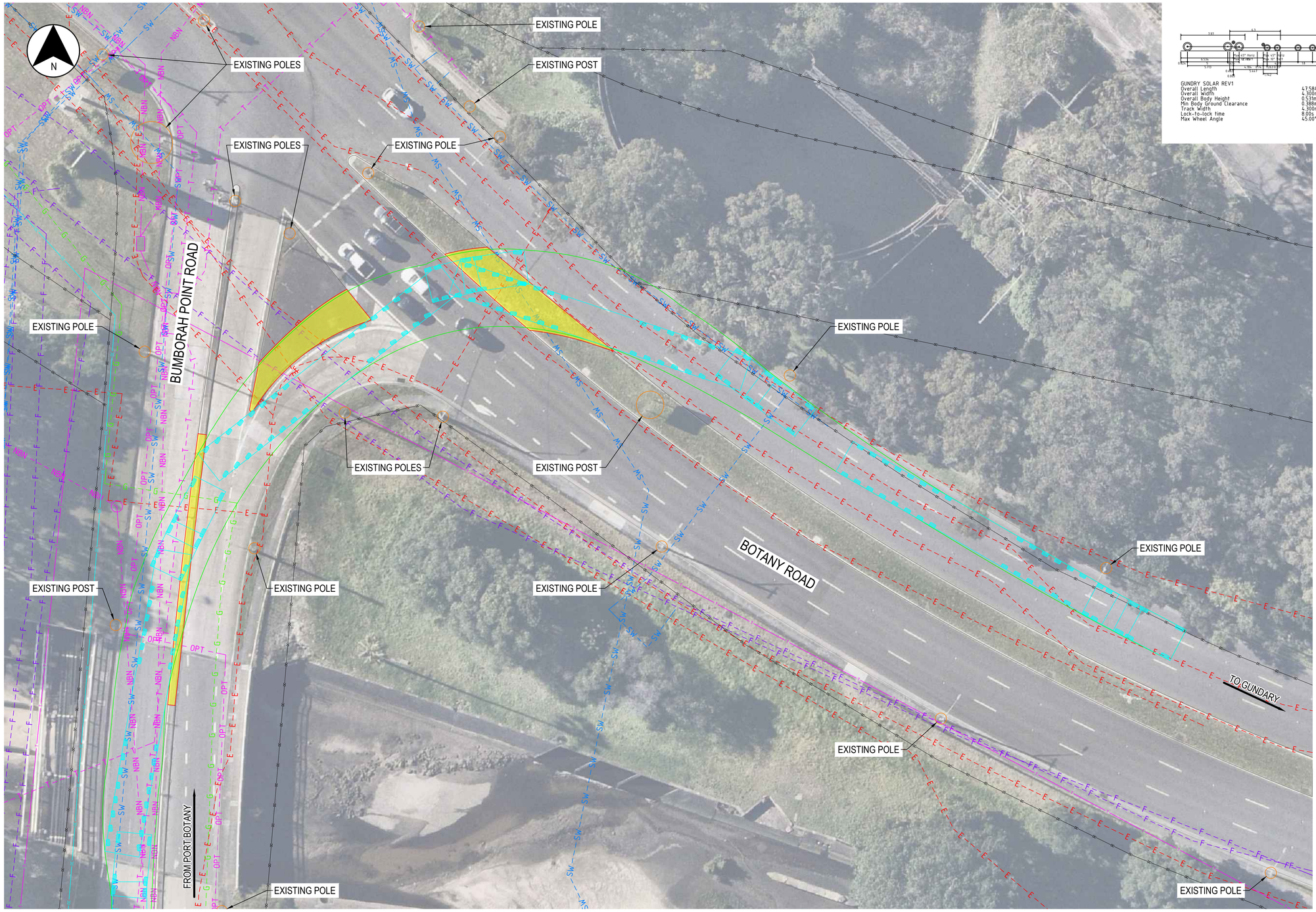

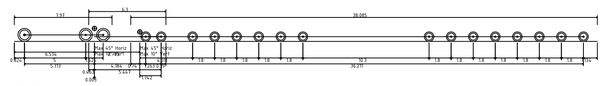

GUNDRY SOLAR REV1

Overall Length	47.584m
Overall Width	4.300m
Overall Body Height	0.539m
Min Body Ground Clearance	0.388m
Track Width	4.300m
Lock-to-lock time	8.00s
Max Wheel Angle	45.00°

CAB/TRAILER NOT DRAWN

LEGEND

- EXISTING BOUNDARY (DCDB)
- EXISTING EDGE OF ROAD
- PROPOSED EDGE OF PAVEMENT
- TEMPORARY WORKS
- MEDIAN PAVEMENT WORKS
- VEHICLE TURNING PATH
- DENOTES 500mm CLEARANCE AROUND EXISTING STREET FURNITURE, POST OR POLE AS NOTED ON PLAN

SERVICES

- NBN — EXISTING NBN SERVICE DIGITISED (BYDA)
- OPT — EXISTING OPTUS SERVICE DIGITISED (BYDA)
- T — EXISTING TELSTRA SERVICE DIGITISED (BYDA)
- EXISTING TPG SERVICE DIGITISED (BYDA)
- G — EXISTING JEMENA SERVICE DIGITISED (BYDA)
- EXISTING ORICA SERVICE DIGITISED (BYDA)
- SW — EXISTING SYDNEY WATER SERVICE DIGITISED (BYDA)
- F — EXISTING FREYSSINET SERVICE DIGITISED (BYDA)
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PINCH POINT 1
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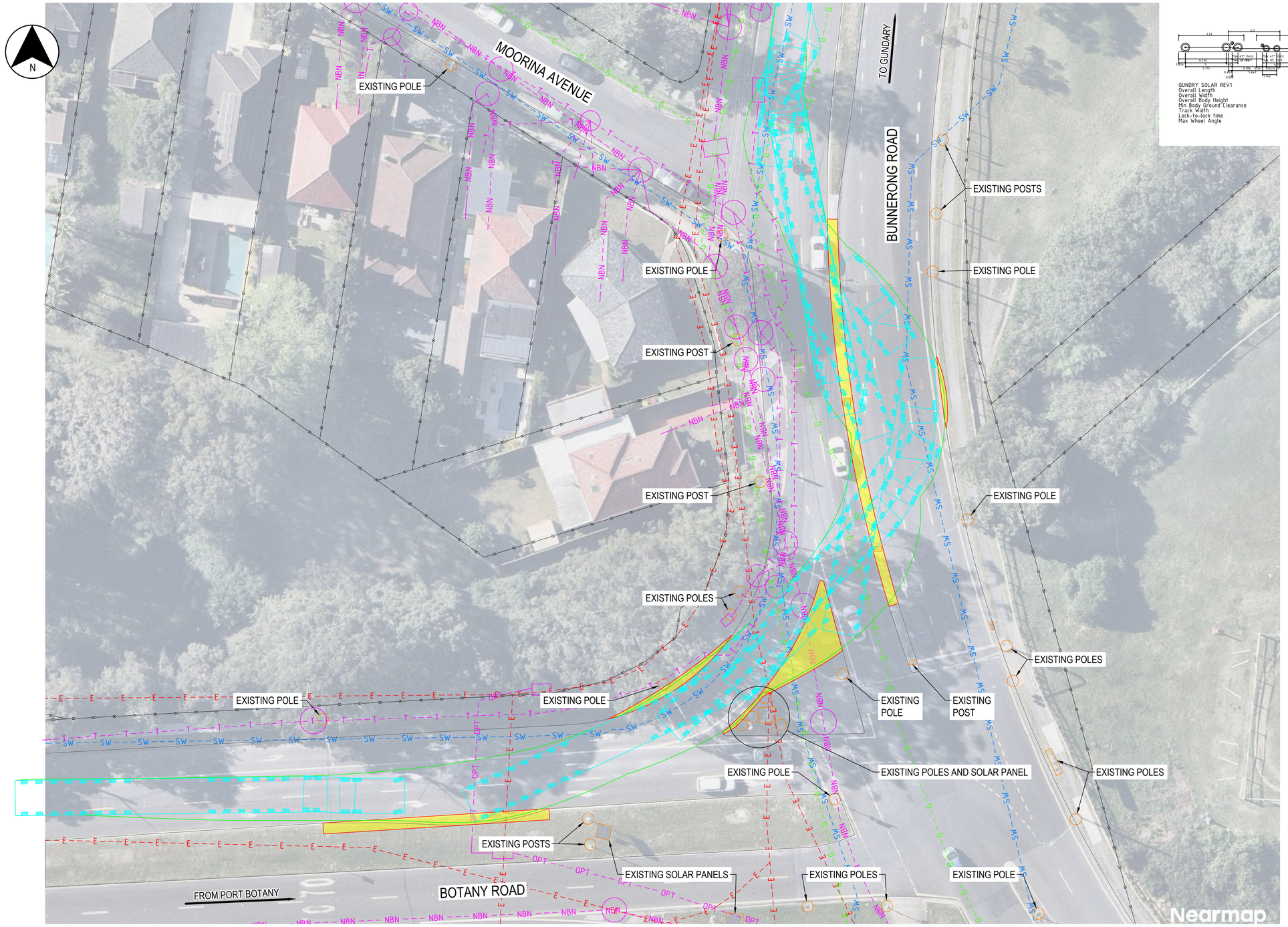

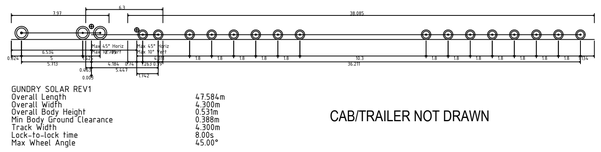

LEGEND

- EXISTING BOUNDARY (DCDB)
- EXISTING EDGE OF ROAD
- PROPOSED EDGE OF PAVEMENT
- TEMPORARY WORKS
- MEDIAN PAVEMENT WORKS
- VEHICLE TURNING PATH
- DENOTES 500mm CLEARANCE AROUND EXISTING STREET FURNITURE, POST OR POLE AS NOTED ON PLAN

SERVICES

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PINCH POINT 2
PLAN

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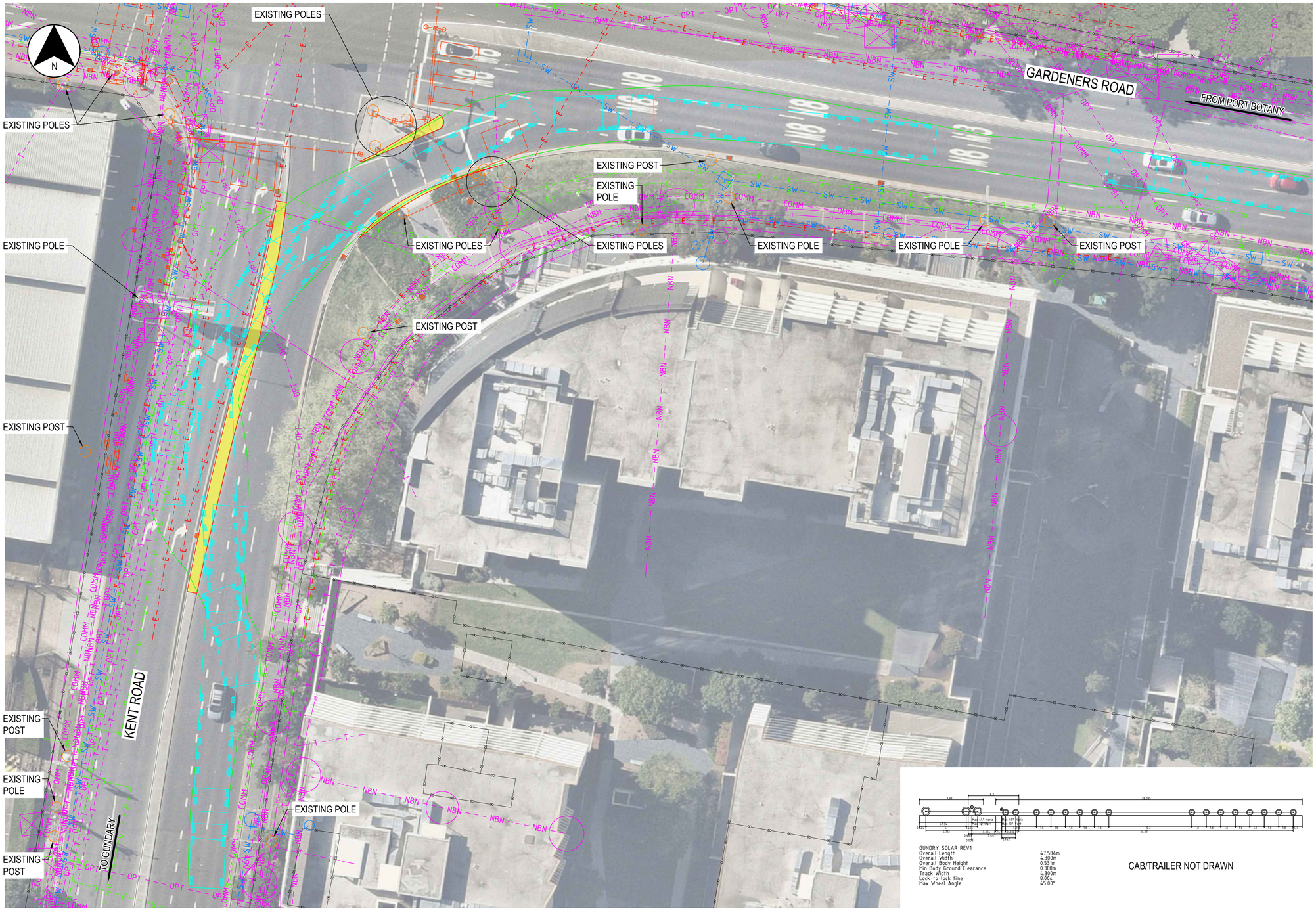

LEGEND

- EXISTING BOUNDARY (DCDB)
- EXISTING EDGE OF ROAD
- PROPOSED EDGE OF PAVEMENT
- TEMPORARY WORKS
- MEDIAN PAVEMENT WORKS
- VEHICLE TURNING PATH
- DENOTES 500mm CLEARANCE AROUND EXISTING STREET FURNITURE, POST OR POLE AS NOTED ON PLAN

SERVICES

- COMM — EXISTING UECOMM SERVICE DIGITISED (BYDA)
- NB — EXISTING NEXGEN SERVICE DIGITISED (BYDA)
- NBN — EXISTING NBN SERVICE DIGITISED (BYDA)
- OPT — EXISTING OPTUS SERVICE DIGITISED (BYDA)
- OPTIC — EXISTING VOCUS SERVICE DIGITISED (BYDA)
- T — EXISTING TELSTRA SERVICE DIGITISED (BYDA)
- T — EXISTING TPG SERVICE DIGITISED (BYDA)
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- G — EXISTING JEMENA SERVICE DIGITISED (BYDA)
- SW — EXISTING SYDNEY WATER SERVICE DIGITISED (BYDA)
- NW — EXISTING TfNSW SERVICE DIGITISED (BYDA)
- E — EXISTING AUSGRID SERVICE DIGITISED (BYDA)

NOTES

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GUNDRY SOLAR REV1	
Overall Length	47.584m
Overall Width	4.300m
Overall Body Height	0.531m
Min Body Ground Clearance	0.388m
Track Width	4.300m
Lock-to-lock time	8.00s
Max Wheel Angle	45.00°

CAB/TRAILER NOT DRAWN

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PINCH POINT 3 PLAN

SCALE 1:250

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COORDINATE SYSTEM: MGA Z56 GDA2020 GDA2020

HEIGHT DATUM: AHD

SCALE: 1:250

2.5 0 5 10m

SCALE 1:250 FULL SIZE A1

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PINCH POINT 3
PLAN

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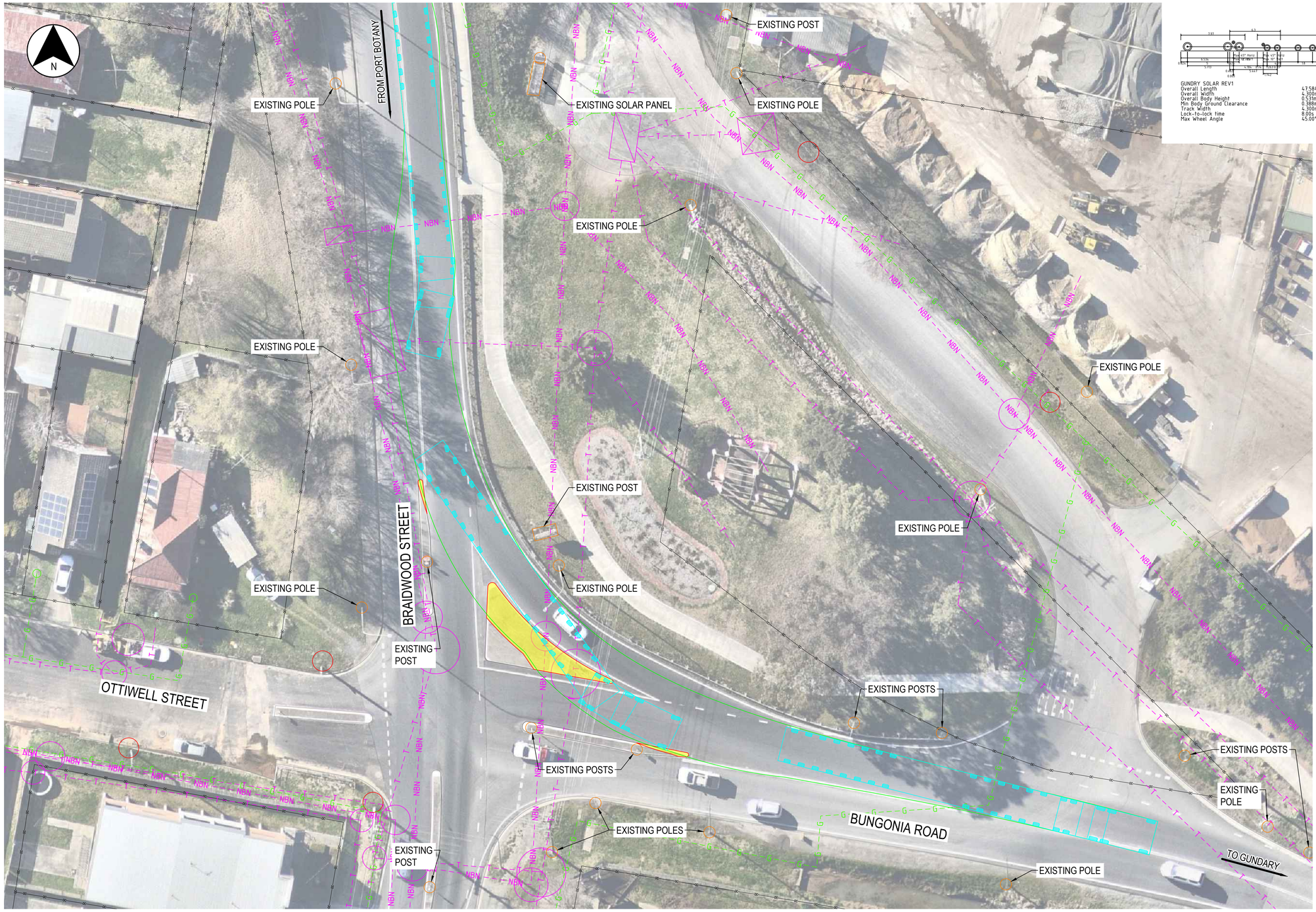

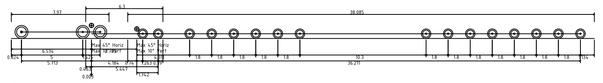

GUNDRY SOLAR REV1

Overall Length	47.584m
Overall Width	4.300m
Overall Body Height	0.539m
Min Body Ground Clearance	0.388m
Track Width	4.300m
Lock-to-lock time	8.00s
Max Wheel Angle	45.00°

CAB/TRAILER NOT DRAWN

LEGEND

- EXISTING BOUNDARY (DCDB)
- EXISTING EDGE OF ROAD
- PROPOSED EDGE OF PAVEMENT
- TEMPORARY WORKS
- MEDIAN PAVEMENT WORKS
- VEHICLE TURNING PATH
- DENOTES 500mm CLEARANCE AROUND EXISTING STREET FURNITURE, POST OR POLE AS NOTED ON PLAN

SERVICES

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- G — G — EXISTING JEMENA SERVICE DIGITISED (BYDA)
- EXISTING ESSENTIAL ENERGY SERVICE DIGITISED (BYDA)

NOTES

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PINCH POINT 11 PLAN

SCALE 1:250

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HEIGHT DATUM: AHD

SCALE: 1:250

2.5 0 5 10m

SCALE 1:250 FULL SIZE A1

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DESIGN CHECK	B.COLLYER	17.12.25
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PINCH POINT 11
PLAN

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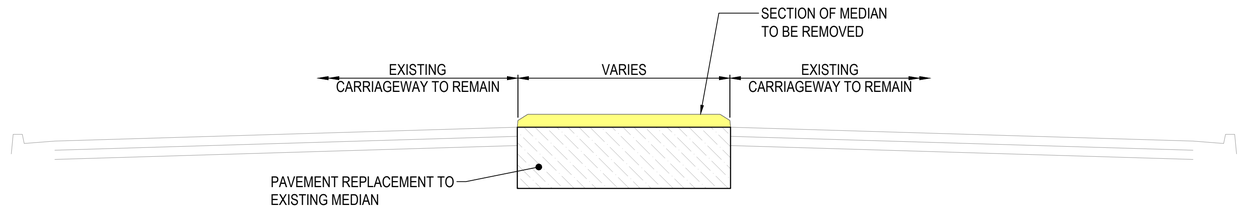

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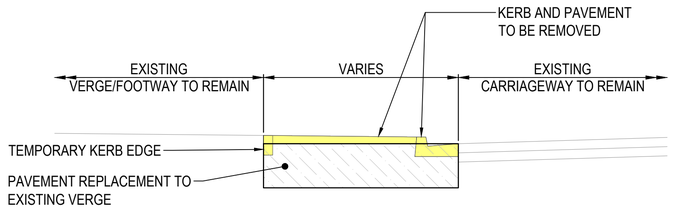

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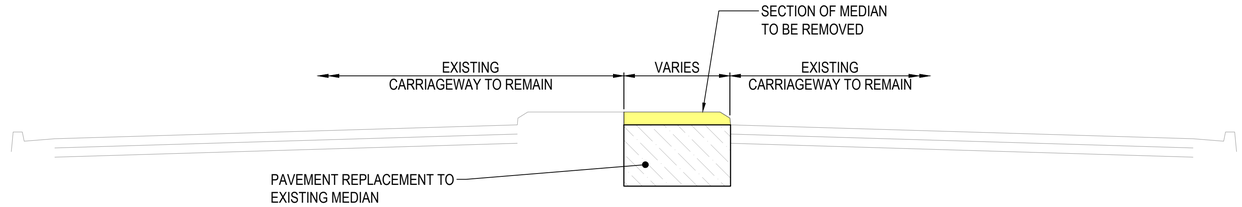

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HALF-MEDIAN REMOVAL
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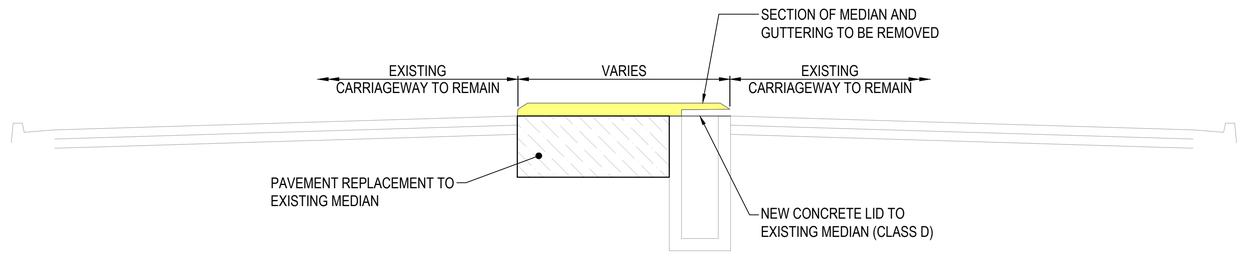

TYPICAL SECTION
MEDIAN REMOVAL WITH DRAINAGE
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HEIGHT DATUM: AHD

SCALE: 1:50

0.5 0 1 2m

SCALE 1:50 FULL SIZE A1

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Appendix D Glint and Glare Assessment

Gundary Solar Farm

Glint & Glare Assessment

Gundary Solar Farm

Glint & Glare Assessment

Prepared for
Umwelt Pty Ltd on behalf of Lightsource bp

Issue
L

Project Number
2800

Revision	Date	Author	Checked	Comment
F	23.05.2024	SW	TB	Final For Submission
G	27.05.2024	SW	TB	Final For Submission
H	03.07.2024	TB	TB	Final For Submission
I	15.10.2025	NL	AR	Update for RFI
J	7.11.2025	CD	-	Update for RFI
K	10.11.2025	CD	-	Update for RFI
L	12.11.2025	CD	-	Update for RFI

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Executive Summary

Moir Landscape Architecture Pty Ltd (trading as Moir Studio) have been engaged by Umwelt Pty Limited on behalf of Lightsource bp (the proponent) to provide a Glint and Glare Assessment for the proposed Gundary Solar Farm (the Project). This report has been updated in response to the Request For Information (RFI) received from the New South Wales (NSW) Department of Planning, Housing and Infrastructure (DPHI) for State Significant Development (SSD) 48225958.

This Project is located approximately 10 kilometres (km) southeast of Goulburn (NSW) in Goulburn Mulwaree Local Government Area (LGA).

The Glint and Glare Assessment has been prepared in accordance with the DPHI Large-Scale Solar Energy Guideline (November 2024).

In accordance with the Guideline, the following has been assessed:

- Assessment of residential receptors within 3 km of the proposed solar array that have a line of sight to the Project.

- All roads and rail lines within 1 km of the proposed solar array

- Aviation receptors within 5km of the proposed solar array.

Moir Studio have undertaken this glint and glare assessment utilising the Solar Glare Hazard Analysis Tool (SGHAT). The SGHAT is used to evaluate glare resulting from solar farms at different receptors, based on proximity, orientation and specifications of the PV modules.

A total of 54 residential receptors with a line of sight to the Project within 3km and three (3) Public Receptors within 5km of the Project were identified as sensitive Observation Points (OP). Based on the desktop assessment, low levels of "yellow" glare is predicted, and low to moderate levels of "green" glare.

Two (2) road receptors were identified within 1 km of the Project. Kooringaroo Road has been identified as having the potential to experience moderate levels of “yellow” glare from the Project, and requires mitigation in accordance with the Guideline.

One (1) landing strip was identified within a 5km radius north-west of the Project. Two flight paths were identified at the landing strip. Based on the desktop assessment, no potential glare was identified for either flight path.

It is important to reiterate that the assessment is based on a worst-case scenario and does not take into account weather conditions, or intervening elements such as topography, vegetation and built structures.

Lightsource bp is committing to a 5m-wide screen planting along the eastern and north-eastern boundary, designed to mitigate the potential glare impacts on a small section of Kooringaroo Road.

Additional mitigation has been assessed using an alternative resting angle of 22° (Scenario 2) to reduce potential glare. Scenario 2 represents a conservative, worst-case assessment to demonstrate the effectiveness of this measure. As outlined in Section 8.1.1 and detailed in Appendix B, this adjustment eliminates all instances of glare.

Principles for mitigation to reduce potential glare have been discussed in detail in this report in accordance with the Large-Scale Solar Energy Guideline Technical Supplement - Landscape and Visual Impact Assessment.

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1.0 Introduction

1.1 Introduction

Moir Studio have been engaged by Umwelt Pty Ltd on behalf of Lightsource bp to prepare a Glint and Glare Assessment for the proposed Gundary Solar Farm (referred to hereafter as the Project). This report has been updated in response to Request For Information (RFI) from the NSW Department of Planning, Housing and Infrastructure (DPHI) for State Significant Development (SSD) 48225958.

The Glint and Glare Assessment has been prepared in accordance with the New South Wales (NSW) Department of Housing, Planning and Infrastructure (DPHI) Large-Scale Solar Energy Guideline, referred to hereafter as 'the Guideline' (DPHI, 2024).

1.1.1 Overview of Glint and Glare

The Guideline defines glint as a momentary flash of bright light and glare as a continuous source of continuous, excessive brightness (DPHI, 2024). While it is acknowledged that '*significant glint and glare impacts are uncommon with large-scale solar energy developments* ' (DPHI, 2024), the purpose of this report is ' *to model and assess these impacts to ensure any potential significant impact is avoided or mitigated appropriately*' (DPHI 2024).

The Guideline provides Performance Objectives for the impacts of glare only, therefore this report has focused on the impact of glare on surrounding receptors. The Performance Objectives of the Guideline for residential receptors, road and rail receptors and aviation receptors are outlined in **Section 4.2, Section 5.2** and **Section 6.2** respectively.

A Glint and Glare Assessment needs be undertaken to ensure that sensitive visual receptors such as road users, surrounding rail network, air traffic controllers and pilots are not significantly impacted by the potential glare from the Project, and that nearby residential locations have a reduced level of 'nuisance' from potential glare (DPHI 2024).

1.1.2 Likelihood of Glint & Glare Impacts

The Guidelines note that '*significant glint and glare impacts are uncommon with large-scale solar energy developments because*:

- *Solar panels are designed to absorb light and typically reflect less than 2% of incoming sunlight*
- *Glint and glare typically occur for short periods of time and require very specific geometric and atmospheric conditions*
- *Many solar energy projects are now fitted with tracking panels that can be adjusted to avoid or minimise the geometric conditions needed to cause glint and glare (DPHI 2024).*

The purposes of this report is to identify any potential large scale glare impacts and take appropriate measures to mitigate these potential impacts.

1.2 Glint and Glare Key Principles

The key glare principles for ensuring the Project can be undertaken whilst maintaining an acceptable level of amenity are outlined in the Guideline as follows:

1. Solar panels should be sited to reduce the likely impacts of glint and glare.

2. Solar panels and other infrastructure should be constructed of materials and / or treated to minimise glint and glare.

3. If a large scale-solar energy development is likely to exceed the relevant criteria for glare and standards for glint, mitigation strategies must be adopted to reduce the impacts.

1.3 Assessment Requirements

This Glint and Glare Assessment Report (report) has been structured in accordance with the Guidelines, **Table 01** outlines where the relevant matters have been addressed in this report. The objective of the assessment as stated in the Guideline is to "*demonstrate that glint and glare would not pose a significant risk to motorists or pilots and that nuisance from glare is minimised for residential locations in accordance with the objectives outlines in [the Guideline]*".

Table 01 Overview of Assessment Requirements

Report Structure	
Requirements for Glint and Glare Assessment:	**Addressed in report:**
A description of the proposed PV panels indicating: - The axis of rotation and maximum tilt angle - The light absorption efficiency and / or refractive index values at different angles. - Whether any backtracking is proposed and the time and duration of these operations.	**Refer to:** **Section 3.0: Project Overview**
A justification for excluding any modelled glare results because they would be insignificant due to the size, position and luminance of the glare source or high ambient luminance.	**Refer to:** **Section 2.0: Study Method**
Results of the glint and glare analysis for each assessable receiver	**Refer to:** **Section 4.0: Residential Receptors** (Assess all residential dwellings within 3 km of the proposed solar array that have a line of sight.) **Section 5.0: Road and Rail Receptors** (Assess all roads and rail lines within 1 km of the proposed solar array.) **Section 6.0: Aviation Receptors** (Assess all air traffic control towers and take off / landing approaches to any runway or landing strip within 5 km of the proposed solar array.)
Identification of existing vegetation or built structures and a quantitative assessment of whether these features would eliminate or reduce the modelled impacts.	**Refer to Summary Tables**
Details of strategies to either avoid or mitigate impacts including re-siting or sizing the Project, altering the tracking patterns, implementing vegetation screening, or entering neighbour agreements with landowners if all other measures have been exhausted.	**Refer to:** **Section 8.0: Mitigation Recommendations**

2.0 Study Method

2.1 Assessment Methodology

Moir Studio have undertaken this Glint and Glare Assessment utilising Solar Glare Hazard Analysis Tool (SGHAT) developed by Sandia National Laboratories. The SGHAT is used to evaluate glare resulting from solar farms at different receptors, based on proximity, orientation and specifications of the PV modules. This tool is recognised by the Australian Government Civil Aviation Safety Authority (CASA).

SGHAT is used to indicate the nature of glare that can be expected at each potential receptor. Glare can be broadly classified into three categories and presented by the following three colours:

- **Green Glare**: Low potential for temporary after-image
- **Yellow Glare**: Potential for temporary after-image
- **Red Glare**: Retinal burn, not expected for PV.

Note: The main focus of this assessment is the yellow glare. Red glare is not expected for PV and green glare has low potential to cause after image and deemed low impact (HO,2011).

The glare analysis tool used to assess the glint and glare hazard was run at a simulation interval of one minute, based on the reflectivity of solar rays off PV modules which typically lasts for at least one minute.

Modelling for the solar farms in the SGHAT tool is based on the following factors:

- Position of the sun over time with respect to the location of the proposed solar farm.
- Assessment is based on a worst case scenario assuming clear weather all year round, (ie. no consideration of cloud coverage).
- Tracking axis tilt, tracking axis orientation and properties of the PV modules.

2.2 Modelling Limitations

It should be emphasized that the results of the SGHAT represent a worst-case scenario model. Any results of potential for glare and corresponding proposed mitigation measures are based off this conservative estimate. The analysis gives an indication of potential glint and glare effects and does not consider:

- Intervening elements such as existing vegetation, built structures or topography.
- Varying weather conditions that reduce glare such as cloud cover. The analysis is only based on worst-case scenario weather conditions for glare (ei. Clear weather conditions).
- Technical improvements to Solar Panel materials to reduce glare reflectivity in the last 10 years (the modelling is based off 2015 Solar Panel materials and glare effects) (Reference Forge Solar and 2015 study).

2.3 Modelling Assumptions

The glare and glint impact for a project is calculated utilising the geographic location, elevation, position of the sun and other vector calculations including module orientation, reflective environment and visual factors. Sun position is determined at every one (1) minute interval through out the year.

Although the SGHAT is an extensive software to understand the impacts of potential glare, it does not consider weather conditions, separation between PV modules and existing surrounding vegetation (if present) between the Project and a sensitive receptor.

Single axis tracking PV panels capable of rotating to a maximum of 60° have been considered to indicate a full rotational range of 120° for this analysis. The trackers are oriented north-south with a maximum pitch distance of 5 m. Glare modelling has been conducted to correspond to maximum tracker height to provide a wider range of observed solar glare based on the extremities.

The glint and glare effects of PV panels depends on the scale and type of infrastructure, the prominence and topography of the site relative to the surrounding environment, and any proposed screening measures to reduce visibility of the site.

Glare modelling has been conducted using the Shade-slope backtracking function within the SGHAT tool. Ground Coverage Ratio (GCR) calculations are used within the SGHAT tool for 'Shade-Slope' backtracking analysis. GCR is defined as the ratio of the array length (L) to proposed pitch distance (R) (Doubleday et al. 2016).

For this assessment GCR is calculated considering L = 2.4 m and R = 5 m.

The resulting GCR = 0.47.

Section 3.0 provides an overview of the PV panel parameters used for the assessment.

$$\mathrm{GCR} = \frac{L}{R} .$$

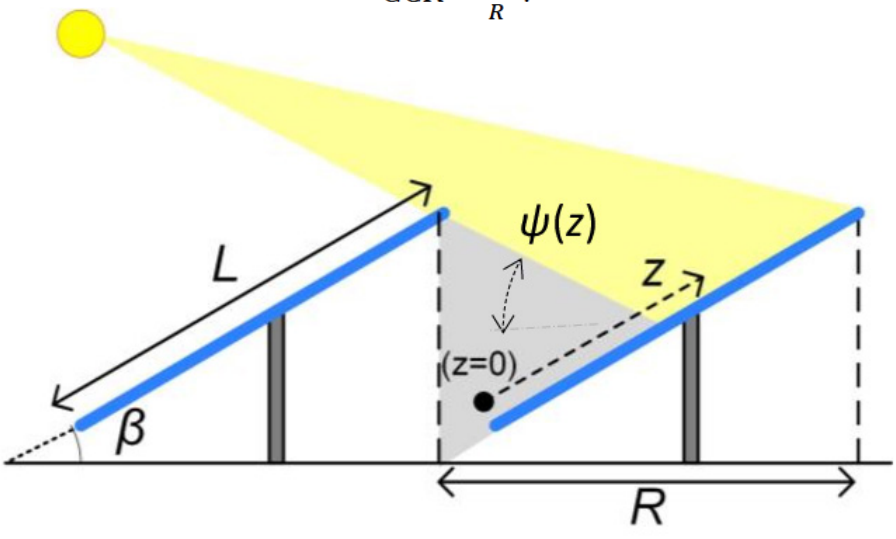


Figure 01 GCR Calculation

Imagery Source: Doubleday et al. 2016

2.4 Backtracking Operations

A single axis horizontal tracking system can be configured to do a 'backtracking' technique, which implies that when the sun is low in the sky in the morning or evening, the tracking system can adjust the panels to maximise solar capture while minimising overshadowing.

The SGHAT software utilised for this assessment uses a simplified model of backtracking. Single-axis trackers follow the movement of the sun as it moves east to west throughout the day. Yields are maximised, and light reflection is minimised when panels are directly facing the sun. In times when the sun is not in the tracking range, we assume that the panels instantaneously revert to their resting angle of 0°. Due to this assumption, glare from the backtracking mechanism will be more conservatively simulated for the purposes of this assessment and at times of sunset and sunrise, when the sun is at a lower angle relative to the array, glare impacts will be more noticeable.

Variable angles of incidence of the sun relative to the panels may occur when the tracking system is performing a backtracking operation, and this variation is somewhat represented by SGHAT software.

Shade-slope backtracking function within the SGHAT software considers the lowest possible panel rotation angle during backtracking. Therefore, backtracking operations are determined using the 0° resting angle option. This function simulates the impression of the panels returning to a pre-defined angle after the maximum tilt angle has been attained.

It is important to note that this backtracking modelling is not a realistic representation of how a backtracking technique would work in reality, however, it provides the worst-case scenario of the potential glare consequences of shifting the PV panels away from the sun after the maximum tilt is reached.

The following parameters have been considered for this assessment in Scenario 1 to simulate a typical backtracking process for the Project:

- A maximum tracking angle of 60° is considered to indicate a full rotational range of 120°.
- To simulate 'backtracking', a 'resting angle' of 0° has been modelled, assuming the PV modules move directly to 0° once maximum tilt of 60° is reached. This represents a worst case scenario.

2.5 Operational Management Strategy

Utilising operational management techniques (forming an operational mitigation strategy) is an alternative mitigation measure to alter the functioning of the PV array during the backtracking mode.

This approach serves to mitigate glare effectively by addressing the potential causes of glint and glare impact through operational intervention. To address this strategy and reduce the potential glare impacts linked to the Project, the operation of the Project has been rigorously assessed and adjustments to the tracking patterns have been modelled using the SGHAT software. The following aspects of each scenario have been undertaken to ascertain an appropriate mitigation strategy:

- **Scenario 1** (worst case): : Normal tracking with backtracking and a resting angle of 0°. This scenario was modelled as a worst-case scenario for the Project. In this case, the panels move between the operational range (maximum tilt) discussed in Section 2.4 and backtrack to 0° when the maximum tilt has been reached as discussed in **Section 2.4** (refer to **Figure 02**).
- **Scenario 2**: : Normal tracking with backtracking and night time stowing angle of 22° - scenario was modelled with a normal tracking angle of ±60° angle with backtracking operation. In this case, the panels move between the operational range (maximum tilt) and backtrack to 22° when the sun is out of range (sunrise and sunset) and remain at this angle. Only switching back to 0° during the night.(refer to **Figure 02**).

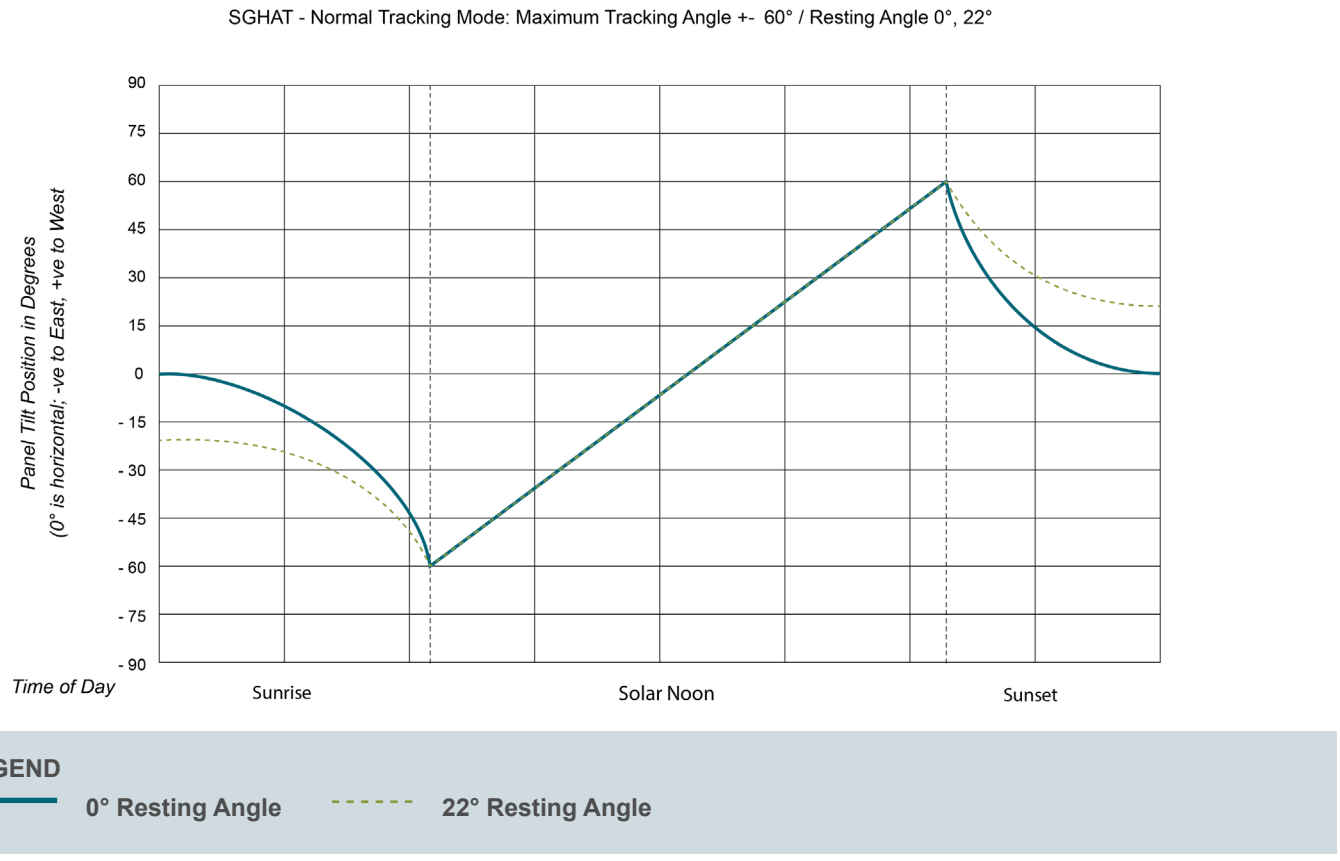


Figure 02 Normal Tracking with Backtracking and Resting Angle of 0° and 22° (2025)

3.0 Project Overview

3.1 Site Context

The Project is located approximately 10 kilometres (km) southeast of Goulburn (NSW) in Goulburn Mulwaree Local Government Area (LGA). (Refer to Figure 1).

The Project encompasses the operation of a 400 Megawatt peak (MWp) solar farm, complete with a Battery Energy Storage System (BESS) ranging from up to 555 MWp and 1,570 Megawatt hour (MWh) capacity, as well as the necessary infrastructure to connect it to the National Electricity Market (NEM) through a new on-site connection to the existing 330kV overhead transmission line, located in the north-west corner of the Project Area. It will cover an area of approximately 702 hectares, with the development infrastructure occupying about 512 hectares.

The Project's access point will be the existing driveway on Windellama Road, via the Hume Highway, specifically at 961 Windellama Road. The Project is situated approximately 1.1 km from the eastern boundary of the proposed Merino Solar Farm Stage 1 and approximately 4.6 km from the north-eastern boundary of the proposed Merino Solar Farm Stage 2. The location of the Project and its regional context is shown in Figure 1.

The Project will generate clean energy to power to around 133,000 homes and reduce carbon emissions by 670,000 tonnes. The BESS will be capable to store roughly 1,570 Megawatt hours (MWh) of on-demand energy for grid supply.

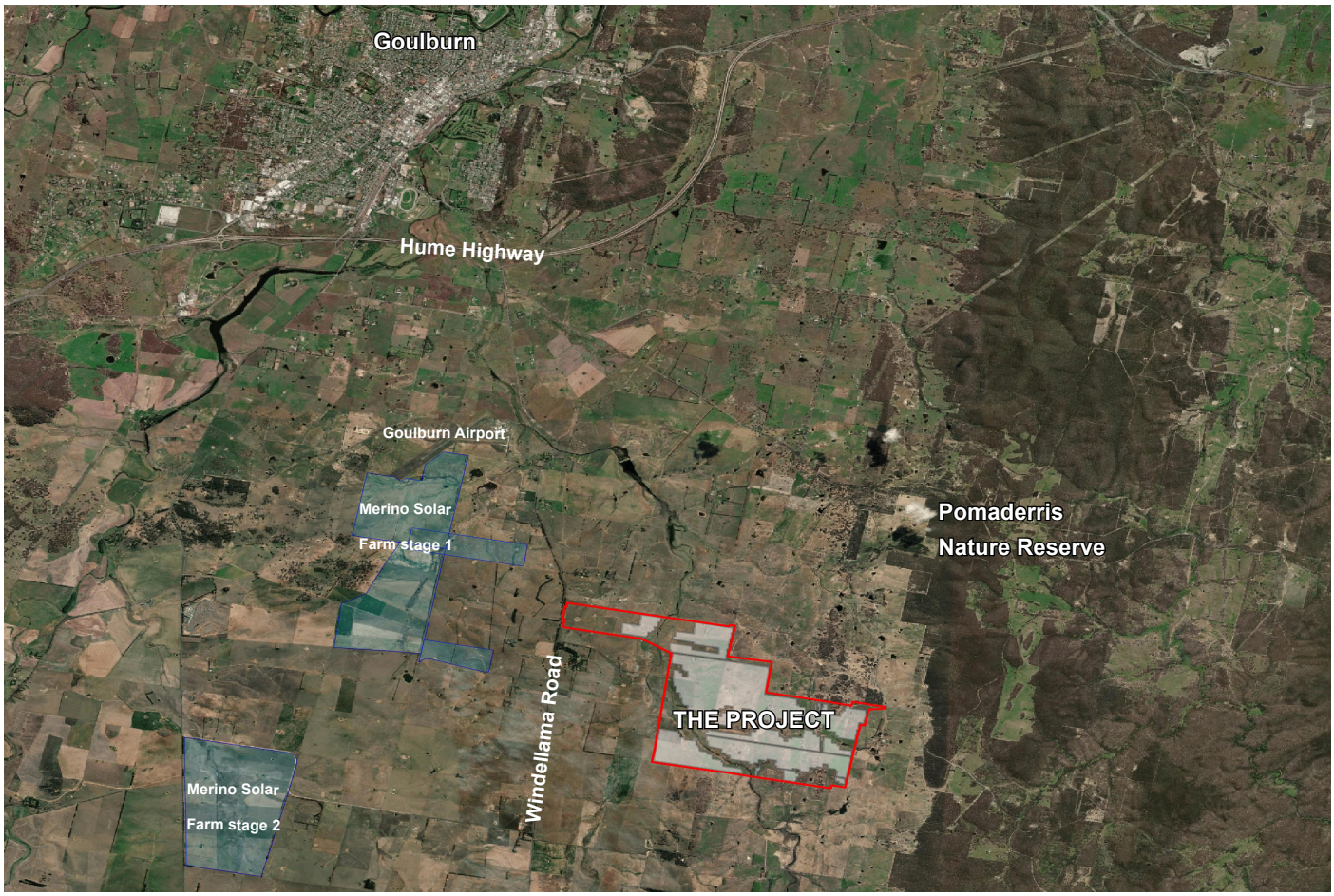


Figure 03 Project Site Context

3.2 Solar Panel Specifications

To attain optimum solar energy collection, the Project modelling has utilised a maximum rotational range of 120°. The panels are fixed on a tubular frame with a single axis tracking procedure. For accuracy, glare analysis has been performed using maximum tracker height not exceeding 1.95 m when facing at the highest angle.

Refer to **Figure 04** for typical panel dimensions utilised for this assessment.

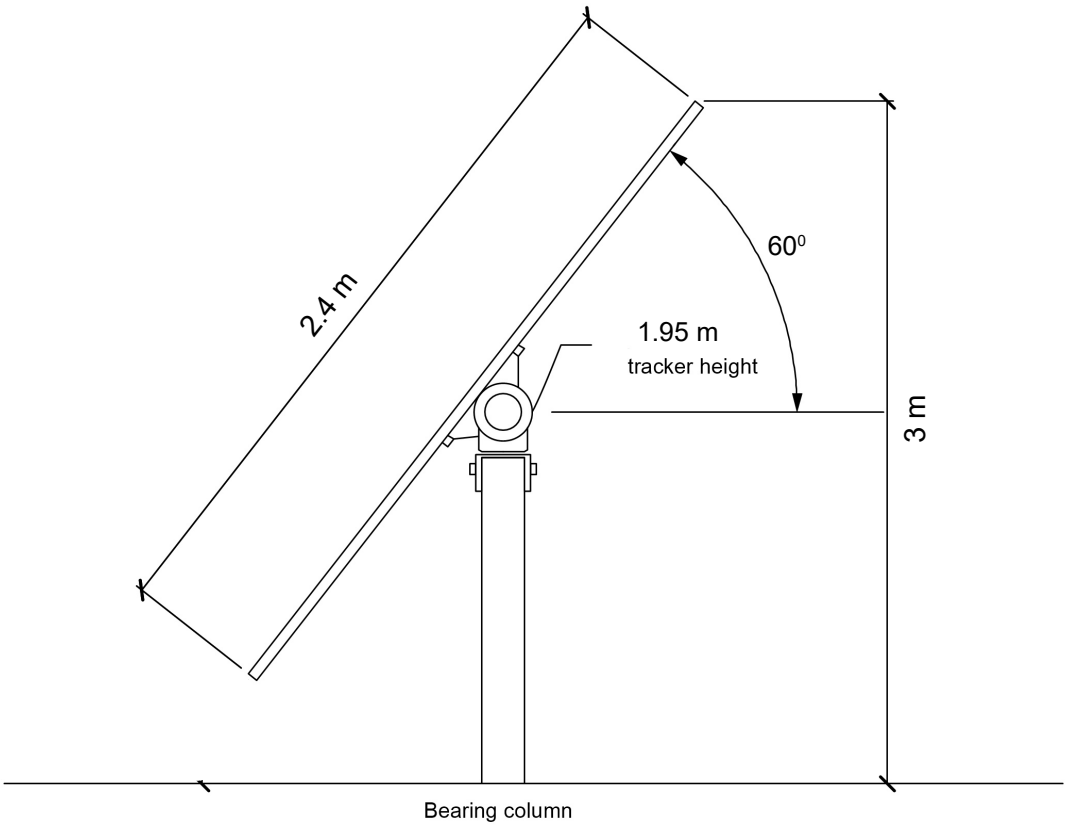


Figure 04 PV Parameters utilised for this assessment
Imagery Source: Provided by the Client

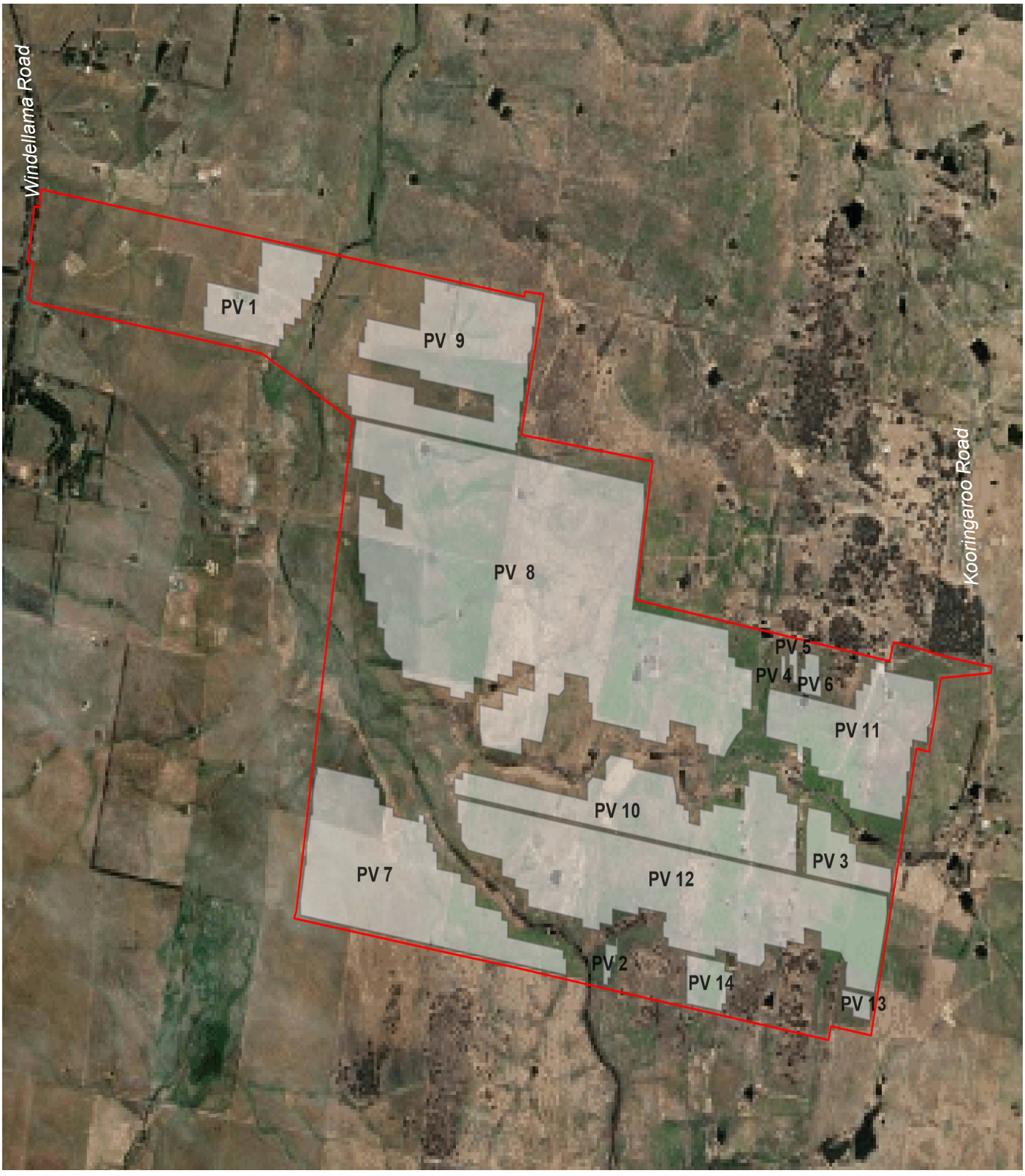
Table 02 Summary of modelling parameters (Scenario 1)

General Solar PV system inputs:			
Input Data	**Units**	**Value**	**Comments**
Time Zone	UTC	+10	Australian Eastern Standard Time (AEST)
Orientation of Array	Degrees	0	Rows aligned in north-south directions
PV Surface materials	-	Smooth Glass with Anti-Reflective Coating	Provided by Lightsource bp.
Mounting Type	-	Single Axis Tracking	Provided by Lightsource bp.
Panel Maximum Height	Metres	4.9m	Provided by Lightsource bp.
Panel Dimensions	Metres	4.8 (L)	Provided by Lightsource bp.
Pitch Distance	Metres	11.7 m	Provided by Lightsource bp.
Single Axis Tracking Parameters			
Module Offset angle	Degrees	0	Facing upwards Panels rotate during operation
Max tracking angle	Degrees	±60° (Range of 120°)	Panels following the Sun
Resting angle	Degrees	0 (Scenario 1)	Angle of rotation of panels when sun is outside tracking range and backtracking rotation has settled
Maximum Tracker Height	Metres	1.95 m	Provided by Lightsource bp.
Backtracking	-	Shade-Slope	Provided by Lightsource bp.
Ground Coverage Ratio	-	47% or 0.47	Provided by Lightsource bp.

3.3 Array Layout

A single axis tracking system follows the sun's trajectory and rotates the panels across east to west to slowly track the movement of the sun. The rows of modules will be spaced approximately 5 m apart to ensure no shading occurs and allow for ease of access for maintenance purposes (refer to **Table 02**).

Refer **Figure 05** for PV array areas and sections.



LEGEND

PV Array Areas for Assessment

0 0.5 1 1.5 2km

Figure 05 PV Array Areas

4.0 Residential Receptors

4.1 Overview of Methodology

Table 03 provides an overview of the scope, methodology and performance objectives for assessment of glint and glare on residential receptors. In accordance with the Guideline, residential receptors within 3 km were considered in the Glint and Glare Assessment.

Table 03 Residential Receptors Assessment Requirements (Source: DPHI, 2024)

Glint and Glare Requirements - Residential Receivers		
Scope	**Methodology**	**Performance Objective**
All residential viewpoints within 3 km of the proposed solar array that have a line of sight to the Project. Representative viewpoints may be used for residential receivers that are clustered together.	**Analysis of the daily and yearly glare impacts in minutes.** **All residential receivers must be assessed at a height of 1.5 m above ground level.**	**Refer to Table 04.**
Note: Modelling for residential receptors is calculated on a receptor height of 1.5 m AGL.		

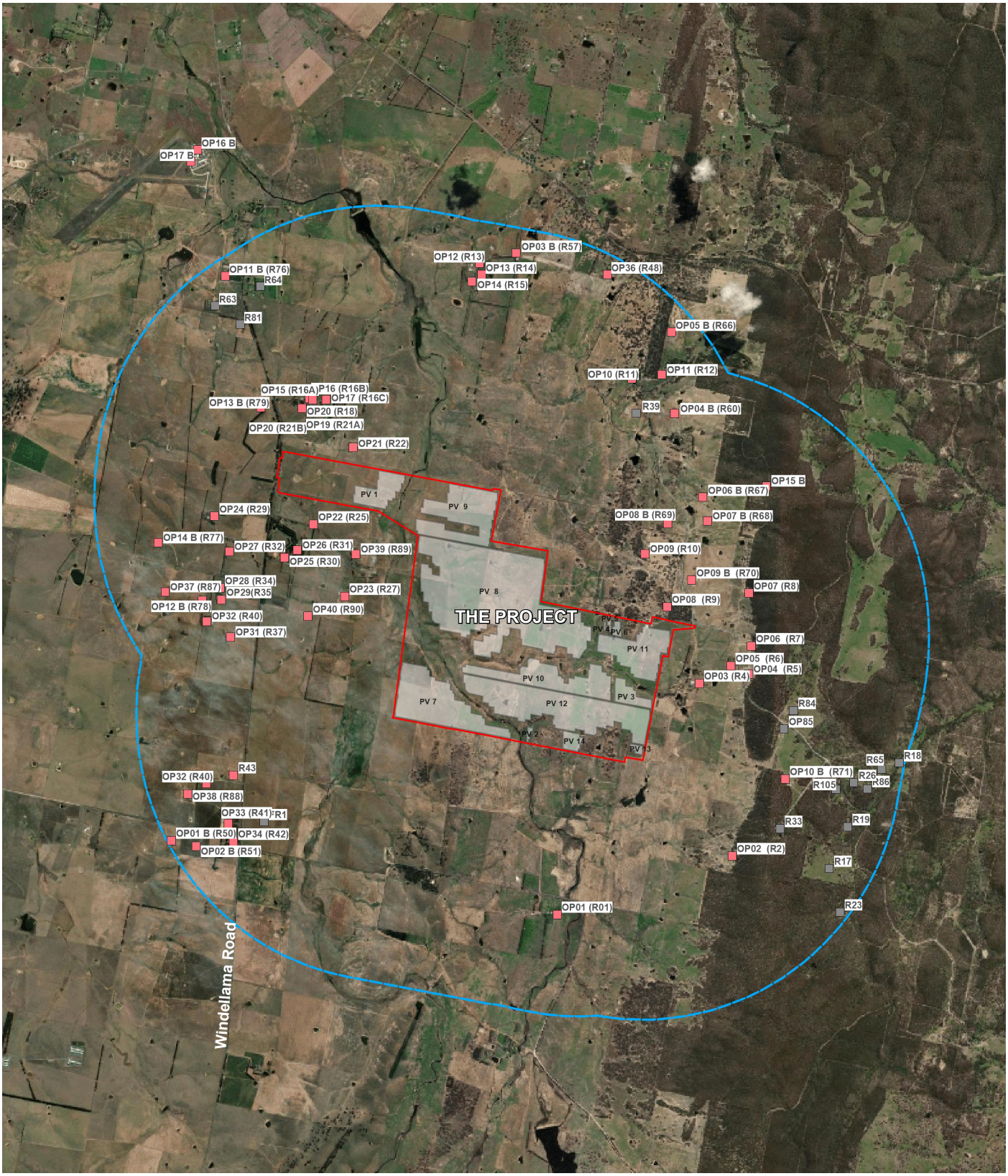
Table 04 Residential Receptor Performance Objectives (Source: DPHI, 2024)

Impact rating and performance objectives for glare impacts on residential receptors		
High Glare Impact	**Moderate Glare Impact**	**Low Glare Impact**
> 30 minutes per day OR	**< 30 minutes per day OR**	**< 10 minutes per day OR**
> 30 hours per year	**< 30 hours per year**	**< 10 hours per year**
Significant amount of glare that should be avoided for both "yellow" and "green" glare. Mitigation required.	*Implement mitigation measures to reduce impacts as far as practicable.*	*No mitigation required for "yellow" or "green" glare.*

4.2 Residential Receptors

A desktop assessment identified 54 residential receptors with a line of sight to the Project within 3 km (refer to **Figure 06**). These have been labelled as free standing Observation Point (OP) receptors within the detailed findings (Refer to Appendix A - Glint and Glare Results). Additionally three (3) key Public Receptor locations within 5 km have been identified. These include Pomaderris Nature Reserve, Adrenaline Skydive, and Goulburn Flight Training Centre (Refer to **Figure 06**).

Table 05 provides an overview of the potential annual glare experienced by the identified receptors based on Scenario 1 (refer to **Section 2.5**).



LEGEND

- PV Array Areas
- Project Boundary
- 3 km from nearest panel
- Receptor with a line of sight to the Project
- Receptor with no line of sight to the Project

Figure 06 Residential Receptors

Table 05 Residential Receptor Assessment Results

Dwelling	Location	Distance to the PV Array Area	Green Glare (Hours Per Year)	Yellow Glare (Hours Per Year)	Requirements
OP 01 (R01)	34°53'1.32"S 149°46'56.86"E	1.86 km	0	0	Nil, no glare impacts
OP 02 (R02)	34°52'38.00"S 149°48'15.95"E	1.53 km	10.3	0	Moderate "green" glare impact, mitigation required.
OP 03 (R04)	34°51'34.87"S 149°47'58.76"E	0.48 km	9.1	0	Low "green" glare impact, no mitigation required.
OP 04 (R05)	34°51'31.02"S 149°48'21.12"E	0.97 km	0	0	Nil, no glare impacts
OP 05 (R06)	34°51'28.13"S 149°48'12.93"E	0.75 km	4.3	0	Low "green" glare impact, no mitigation required.
0P 06 (R07)	34°51'20.59"S 149°48'21.94"E	0.94 km	10.4	0	Moderate "green" glare impact, mitigation required.
OP 07 (R08)	34°51'1.21"S 149°48'20.26"E	1.01 km	16.1	0	Moderate "green" glare impact, mitigation required.
OP 08 (R09)	34°51'7.10"S 149°47'43.14"E	0.28 km	26.1	0	Moderate "green" glare impact, mitigation required.
OP 09 (R10)	34°50'47.89"S 149°47'32.33"E	0.80 km	6	0	Low "green" glare impact, no mitigation required.
OP 10 (R11)	34°49'43.67"S 149°47'24.18"E	0.81 km	0	0	Nil, no glare impacts
OP 11 (R12)	34°49'41.80"S 149°47'37.78"E	2.35 km	0	0	Nil, no glare impacts
OP 12 (R13)	34°49'2.77"S 149°46'13.32"E	2.52 km	0	0	Nil, no glare impacts
OP 13 (R14)	34°49'6.89"S 149°46'14.54"E	2.41 km	0	0	Nil, no glare impacts
OP 14 (R15)	34°49'9.61"S 149°46'10.08"E	2.31 km	0	0	Nil, no glare impacts

Dwelling	Location	Distance to the PV Array Area	Green Glare (Hours Per Year)	Yellow Glare (Hours Per Year)	Requirements
OP 15 (R16A)	34°49'54.22"S 149°44'57.38"E	1.02 km	0	0	Nil, no glare impacts
OP 16 (R16B)	34°49'54.57"S 149°44'58.99"E	1.01 km	0	0	Nil, no glare impacts
OP 17 (R16C)	34°49'54.53"S 149°45'5.09"E	0.99 km	0	0	Nil, no glare impacts
OP 18 (R20)	34°49'57.85"S 149°44'54.25"E	0.85 km	0	0	Nil, no glare impacts
OP 19 (R21A)	34°50'5.15"S 149°44'54.09"E	0.63 km	0	0	Nil, no glare impacts
OP 20 (R21B)	34°50'6.01"S 149°44'53.43"E	0.60 km	0	0	Nil, no glare impacts
OP 21 (R22)	34°50'11.74"S 149°45'18.05"E	0.39 km	0	0	Nil, no glare impacts
OP 22 (R25)	34°50'40.44"S 149°45'0.86"E	0.29 km	7.8	0	Low "green" glare impact, no mitigation required.
OP 23 (R27)	34°51'6.60"S 149°45'15.95"E	0.90 km	11.0	0	Moderate "green" glare impact, mitigation required.
OP 24 (R29)	34°50'38.46"S 149°44'15.55"E	1.03 km	12.4	0	Moderate "green" glare impact, mitigation required.
OP 25 (R30)	34°50'52.99"S 149°44'48.11"E	0.74 km	12.5	0	Moderate "green" glare impact, mitigation required.
OP 26 (R31)	34°50'50.13"S 149°44'53.83"E	0.62 km	20.5	9.1	Moderate "green" glare impact, and Low "yellow" glare impact, mitigation required.
OP 27 (R32)	34°50'51.38"S 149°44'22.85"E	1.05 km	11.6	0	Moderate "green" glare impact, mitigation required.
OP 28 (R34)	34°51'4.78"S 149°44'19.06"E	1.41 km	11.5	2.4	Moderate "green" glare impact, and Low "yellow" glare impact, mitigation required.

Dwelling	Location	Distance to the PV Array Area	Green Glare (Hours Per Year)	Yellow Glare (Hours Per Year)	Requirements
OP 29 (R35)	34°51'9.09"S 149°44'19.74"E	1.50 km	10.3	4.7	Moderate "green" glare impact, and Low "yellow" glare impact, mitigation required.
OP 30 (R36)	34°51'17.21"S 149°44'13.34"E	2.82 km	20.3	0.7	Moderate "green" glare impact, and Low "yellow" glare impact, mitigation required.
OP 31 (R37)	34°51'22.80"S 149°44'24.40"E	1.81 km	20.9	0.4	Moderate "green" glare impact, and Low "yellow" glare impact, mitigation required.
OP 32 (R40)	34°52'16.84"S 149°44'15.21"E	2.33 km	2.6	0	Low "green" glare impact, no mitigation required.
OP 33 (R41)	34°52'31.28"S 149°44'25.62"E	2.29 km	5.7	0	Low "green" glare impact, no mitigation required.
OP 34 (R42)	34°52'37.78"S 149°44'28.17"E	2.35 km	5.8	0	Low "green" glare impact, no mitigation required.
OP 35 (R43)	34°52'13.48"S 149°44'27.50"E	1.99 km	3.1	0	Low "green" glare impact, no mitigation required.
OP 36 (R48)	34°49'5.57"S 149°47'11.81"E	2.81 km	0	0	Nil, no glare impacts
OP 37 (R87)	34°51'6.82"S 149°43'54.13"E	1.92 km	14.7	0	Moderate "green" glare impact, mitigation required.
OP 38 (R88)	34°52'20.86"S 149°44'6.83"E	2.56 km	2.8	0	Low "green" glare impact, no mitigation required.
OP 39 (R89)	34°50'51.06"S 149°45'20.51"E	0.74 km	10.8	0	Moderate "green" glare impact, mitigation required.
OP 40 (R90)	34°51'14.28"S 149°44'59.47"E	1.23 km	11.3	2.4	Moderate "green" glare impact, and Low "yellow" glare impact, mitigation required.
OP 01B (R50)	34°52'38.13"S 149°43'59.87"E	2.96 km	6.5	0	Low "green" glare impact, no mitigation required.
OP 02B (R51)	34°52'40.05"S 149°44'11.32"E	2.74 km	6.7	0	Low "green" glare impact, no mitigation required.

Dwelling	Location	Distance to the PV Array Area	Green Glare (Hours Per Year)	Yellow Glare (Hours Per Year)	Requirements
OP 03B (R57)	34°48'58.62"S 149°46'29.84"E	2.74 km	0	0	Nil, no glare impacts
OP 04B (R60)	34°49'55.99"S 149°47'44.10"E	2.25 km	0	0	Nil, no glare impacts
OP 05B (R66)	34°49'25.99"S 149°47'41.80"E	2.78 km	0	0	Nil, no glare impacts
OP 06B (R67)	34°50'26.43"S 149°47'58.05"E	2.40 km	1.7	0	Low "green" glare impact, no mitigation required.
OP 07B (R68)	34°50'35.16"S 149°48'0.43"E	2.47 km	3.8	0	Low "green" glare impact, no mitigation required.
OP 08B (R69)	34°50'36.46"S 149°47'42.37"E	2.01 km	25.7	0	Moderate "green" glare impact, no mitigation required.
OP 09B (R70)	34°50'57.02"S 149°47'53.93"E	2.46 km	13.5	0	Moderate "green" glare impact, no mitigation required.
OP 10B (R71)	34°52'9.12"S 149°48'39.13"E	1.67 km	0.8	0	Low "green" glare impact, no mitigation required.
OP 11B (R76)	34°49'10.09"S 149°44'17.67"E	2.52 km	0	0	Nil, no glare impacts
OP 12B (R78)	34°51'9.56"S 149°44'11.12"E	1.63 km	12.6	3.7	Moderate "green" glare impact, and Low "yellow" glare impact, mitigation required.
OP 13B (R79)	34°49'57.98"S 149°44'35.43"E	0.99 km	0	0	Nil, no glare impacts
OP 14B (R77)	34°50'48.84"S 149°43'50.35"E	1.75 km	11.9	0	Moderate "green" glare impact, mitigation required.
OP 15B	POMADERRIS NATURE RESERVE	2.70 km	3.6	0	Low "green" glare impact, no mitigation required.
OP 16B	ADRENALIN SKYDIVE	4.24 km	0	0	Nil, no glare impacts
OP 17B	GOULBURN FLIGHT TRAINING CENTRE	4.14 km	0	0	Nil, no glare impacts

4.3 Residential Receptor Results

Based on the desktop assessment for Scenario 1, potential "green" glare has been identified at 35 receptors, and potential “yellow” glare has been identified at seven (7) receptors in the Study Area.

Based on Scenario 1:

- All receptors have a low or nil "yellow" glare impact and do not require mitigation.
- 37 receptors have a low or nil "green" glare impact and do not require mitigation.
- 20 receptors have the potential to receive a moderate impact of between 10 - 30 hrs of annual green glare (worst-case scenario). Mitigation strategies have been outlined in **Section 8.0** to eliminate all instances of glare.

Overall, no mitigation is required for any of the public receptors.

The detailed findings for the receptors are included in the **Appendix A - Glint and Glare Results.**

**It is crucial to emphasise that this assessment is based on a worst-case scenario and does not account for factors such as weather conditions, intervening elements like vegetation, or built structures, which may influence the actual glare experienced.*

5.0 Road & Rail Receptors

5.1 Overview of Methodology

Table 06 provides an overview of the scope, methodology and performance objectives for assessment of glint and glare on road and railway line receptors. In accordance with the Guideline, road and rail receptors within 1 km were considered in the Glint and Glare Assessment.

Table 06 Road and Rail Receptor Assessment Requirements (Source: DPHI, 2024)

Glint and Glare Requirements - Road & Rail		
Scope	**Methodology**	**Performance Objective**
All roads and rail lines within 1 km of the proposed solar array.	**Solar glare analysis to identify whether glint and glare are geometrically possible within the forward looking eyeline of motorists and rail operators.**	**If glare is geometrically possible, then measures should be taken to eliminate the occurrence of glare.** **Alternatively, the applicant must demonstrate that glare would not significantly impede the safe operation of vehicles or the interpretation of signals and signage.**
Note: Modelling for road receptors is calculated on a maximum height of 2.4 m AGL - representative of the eye level for truck drivers (Source: Austroads Ltd. 2021). **Modelling for rail lines is based a representative eye height of 3 m AGL to represent the eye level of train drivers** (Source: Transport Asset Standards Authority 2020).		

5.2 Road and Rail Receptors

The desktop assessment has determined that there are no rail receptors located within a 1km radius of the Project. However, both Windellama Road and Kooringaroo Road have been identified as road receptors within the 1 km radius.

Figure 07 illustrates road receptors identified within 5 km of the PV Array Area.

LEGEND

0 0.5 1 1.5 2km

- PV Array Areas
- Project Boundary
- 3 km from nearest panel
- Road Receptor
- Potential for Yellow Glare

Figure 07 Rail and Road Receptors

Table 07 Road & Rail receptor assessment results

Road/Rail Receptor	Distance to the PV Array Area	Green Glare (Hours Per Year)	Yellow Glare (Hours Per Year)	Existing Screening Factors	Requirements
Kooringaroo Road	0.28 km	95.6	16.7	Limited existing scattered vegetation between the road and the Project. Will partially scatter glare from the Project.	Yellow Glare Impact, mitigation required. Refer to Section 8.0 for recommended mitigation.
Windellama Road	0.29 km	0	0	Existing scattered vegetation along the roadside.	Nil, no glare impacts

5.3 Results of Glint and Glare Assessment - Road and Rail

5.3.1 Impacts of Glare on Road & Rail Receptors

Based on Scenario 1, the glare assessment indicates that Kooringaroo Road has the potential to experience 'yellow' and 'green' glare. 'Yellow' glare is expected to cause a temporary after-image, which can impact those operating vehicles on nearby roads and railways. Therefore, any potential for 'yellow' glare requires mitigation (see **Section 8.0** for mitigation strategies).

The potential for after-image from green glare is low; however, it may cause eye strain if observed for long periods. Due to the speed of travel along the road , the time frame to experience the impacts of 'green' glare are short, therefore, the impacts of 'green' glare are low and do not require mitigation.

5.3.2 Kooringaroo Road

Based on the Scenario 1 glare assessment, it has been determined that Kooringaroo Road is projected to experience a total of approximately 16.7 hours of potential 'yellow' glare per year, and 95.6 hours per year of potential 'green' glare. The following outlines the PV Array areas and times that there is the potential for 'yellow' glare:

- PV Array 10 has the potential to produce up to 16.7 hours per year of potential 'yellow' glare at Kooringaroo Road during the period between October to March. The glare specifically occurs for up to 15 minute periods anytime between 5:50 pm - 7:00 pm, depending on the time of year.

5.3.3 Windellama Road

Based on the Scenario 1 glare assessment, it has been determined that Windellama Road does not have the potential to experience glare impacts from the Project.

**It is crucial to emphasise that this assessment is based on a worst-case scenario and does not account for factors such as weather conditions, intervening elements like vegetation, or built structures, which may influence the actual glare experienced.*

The detailed findings for the receptors are included in the **Appendix A - Glint and Glare Results.**

6.0 Aviation Receptors

6.1 Overview of Methodology

Table 08 provides an overview of the scope, methodology and performance objectives for assessment of glint and glare on aviation receptors. In accordance with the Guideline, aviation receptors within 5 km were considered in the Glint and Glare Assessment.

Table 08 Aviation Receptor Assessment Requirements (Source: DPHI, 2024)

Glint and Glare Requirements - Aviation Receptors		
Scope	**Methodology**	**Performance Objective**
All air traffic control towers and take off / landing approaches to any runway or landing strip within 5 km of the proposed solar array.	**Solar glare analysis that is worst case in all scenarios accounting for all aircraft using the airport (e.g. gliders, helicopters etc).**	**Any glint and glare should be avoided unless the aerodrome operator agrees that the impact would not be material (e.g. occurs at times when there are no flights or would not pose a safety risk to airport operations).**
Note: Modelling for Flight Path receptors is calculated on a threshold crossing height of 50 ft (15 m) in two mile (3.21 km) point ground elevation and the ±50 degree azimuthal and 30 degree vertical viewing angle representative of the pilot field view from cockpit (Source: Rogers, 2015).		

6.2 Aviation Receptors

The desktop assessment has identified the presence of one (1) landing strip located within a 5km radius on north west of the development footprint. For each landing strip, two flight paths have been identified, each with a threshold distance of 2 miles (equivalent to 3.21 km) (Refer to **Figure 08**).

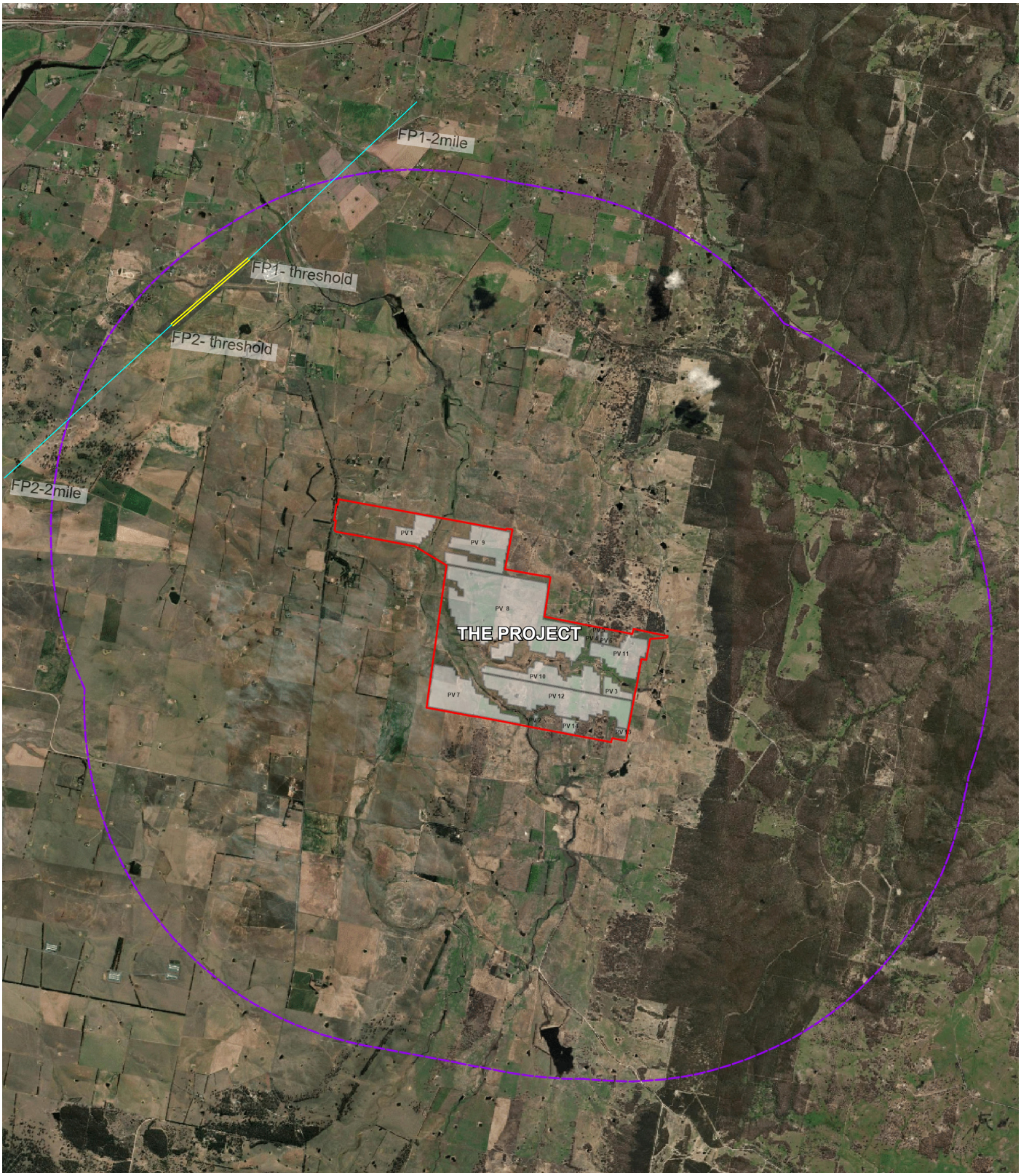
6.3 Results of Glint and Glare Assessment - Aviation

Based on the desktop assessment, two (2) Flight Point thresholds (a threshold of 2 miles representing the flight paths from the identified landing strips) are situated within this 5km. (Refer to Figure 6). The assessment found that no glare was identified for any of the flight paths associated with these thresholds. As a result, no mitigation is required.

Detailed glare impact outputs for each receptor is provided in **Appendix A**.

Table 09 Aviation receptor assessment results

Aviation Receptor	Distance to the PV Array Area	Elevation on Ground (AHD)	Green Glare (Hours Per Year)	Yellow Glare (Hours Per Year)	Requirements
FP01	4.30 km	636 m	0	0	Nil, no glare impacts
FP02	4.40 km	652 m	0	0	Nil, no glare impacts



LEGEND

- PV Array Areas
- Project Boundary
- 5 km from nearest panel
- Aviation Receptor
- 2 Mile Flight Path Threshold

Figure 08 Aviation Receptors

7.0 Performance Objectives

7.1 Summary of Assessment Results

7.1.1 Residential & Public Receptors

Table 04 provides an overview of the scope, methodology and performance objectives for assessment of glint and glare on residential receptors. The assessment undertaken by Moir Studio has been summarised below:

20 residential receptors have the potential to receive moderate levels of 'green' glare and require mitigation.

- Three (3) public viewpoints have the potential to recieve low or nil levels of "green" glare (less than 10 hours per year), and do not require mitigation.
- Seven (7) residential receptors have the potential to experience low levels of "yellow" glare, and do not require mitigation.
- 35 residential receptors have the potential to experience low or nil levels of "green" glare (less than 10 hours per year), and do not require mitigation.
- 20 receptors have the potential to receive moderate glare impacts of between 10 - 30 hrs of annual green glare (worst-case scenario) and require mitigation. Mitigation strategies have been outlined in **Section 8.0** to eliminate all instances of glare.

7.1.2 Road and Rail Receptors

Table 06 provides an overview of the scope, methodology and performance objectives for assessment of glint and glare on road and rail receptors. The assessment undertaken by Moir Studio has been summarised below:

Kooringaroo Road has the potential to experience 'yellow' glare and "green" glare.

- Kooringaroo Road may experience up to 95.6 hours per year of "green" glare, and 16.7 hours per year of "yellow" glare. "Yellow" glare impacts are caused by PV Array 10.
- Windellama Road will not experience glare impacts from the Project.

'Green' glare is not expected to cause a temporary after-image, and only causes eye strain after a long period. Due to the speed of travel along the road and rail routes, the time frame to experience the impacts of 'green' glare are short, therefore the impacts of 'green' glare are negligible and do not require mitigation.

'Yellow' glare is expected to cause a temporary after-image, which can impact those operating vehicles on nearby road and rail receptors. Mitigation strategies are detailed in **Section 8.0.**

7.1.3 Aviation Receptors

Table 08 provides an overview of the scope, methodology and performance objectives for assessment of glint and glare on aviation receptors. The assessment undertaken by Moir Studio has been summarised below:

Both flight paths identified within the Study Area will not experience any glare impacts.

A landing strip was identified within the 5 km aviation Study Area, the two flight paths associated with this landing strip will not experience glare impacts, and does not require mitigation.

8.0 Mitigation Measures

8.1 Proposed Mitigation Strategies

The Guideline states: "*While glint and glare impacts can be relatively uncommon, it is important to model and assess these impacts to ensure any potential significant impact is avoided or mitigated appropriately*" (DPHI, 2024).

To meet the Guideline's requirements, mitigation is necessary to reduce the impacts of 'yellow' glare on Kooringaroo Road.

Additionally, the following operational management strategies have been developed to allow all instances of glare to be eliminated.

8.1.1 Operational Management

Moir Studio has undertaken an additional assessment (Scenario 2) that models an alternate resting angle to mitigate potential glare. As outlined in **Section 2.5**, the alternate tracking pattern modelled uses a resting angle of 22°, rather than 0°. While the resting angle in Scenario 2 does not represent the precise way the mitigation would operate in practice, it has been modelled as a conservative, worst-case scenario to demonstrate the potential reduction in glare impacts.

The results of the glare analysis incorporating the 22° resting angles are detailed in **Appendix B**, showing that no instances of glare occurred under Scenario 2. The analysis determined that, to effectively mitigate potential glare, specific sections of panels should not be oriented between 0° and 5° during the periods of 4:45–8:00 a.m. and 5:00–7:30 p.m. As demonstrated by the Scenario 2 results in **Appendix B**, this approach has the potential to eliminate all instances of glare.

It is also noted that the glare assessment does not account for existing screening factors such as intervening vegetation or topography and is therefore considered conservative in areas where such screening is present.

8.1.2 Road and Rail Receptor Results with Mitigation

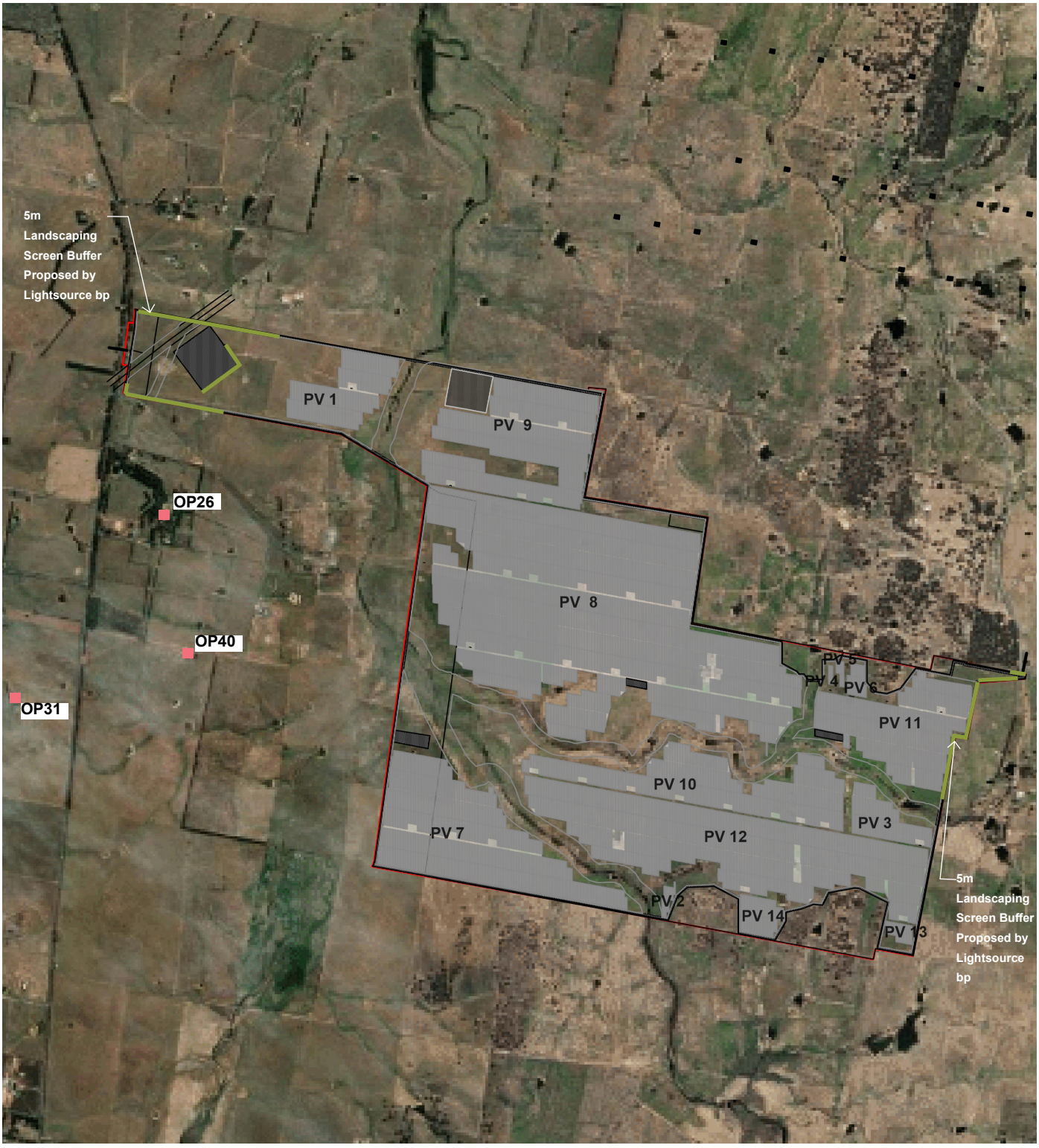
Upon conducting a desktop assessment of the aerial imagery with respect to Kooringaroo Road, it has been observed that there is some limited scattered screening vegetation present between the affected section of the road and the Project. This vegetation may offer partial mitigation of the glare experienced on Kooringaroo Road. However, it is recommended to consider implementing additional screening planting or adjusting the operation time of PV Array 10 to further reduce the potential glare impact.

Mitigation principles have been recommended in accordance with DPHI's Technical Guidelines.

The Technical Supplement states: Vegetation screening, or the planting of trees and shrubs, to visually screen solar energy projects or other potential visual impacts (such as glint and glare) from view may be a useful mitigation option for selected viewpoints. On-site screening, such as perimeter planting, should be considered in the first instance. If this is unlikely to be effective, screening can be considered at affected viewpoints.

In line with these principles, the Project has integrated a 5m landscaping screening buffer, as specified in the Lightsource bp Project layout. This landscape screening buffer will be established as a 5m-wide zone of screening vegetation on the eastern and north-eastern boundary of PV Array 11 as part of the Project's establishment. This strategic placement of vegetation is expected to potentially mitigate glare impacts from the Project, particularly from Kooringaroo Road.

To provide a clear visual representation of the extent and locations of proposed screening vegetation, refer to **Figure 09** for reference.



LEGEND

0 0.5 1 1.5 2km

PV Array Areas

5m Landscaping Screen Buffer proposed by Lightsource bp

Figure 09 Potential Glare on Surrounding Receptors (Scenario 2)

9.0 Conclusion

9.1 Conclusion

The purpose of this Glint and Glare Assessment Report is to identify potential glare impacts from the Project on the surrounding area, including residential receptors (within 3 km of the PV Array Area), road and rail receptors (within 1 km of the PV Array Area), and aviation receptors (within 5 km of the PV Array Area). Moir Studio has undertaken the assessment in accordance with the assessment process outlined within the NSW DPHI's 'Large Scale Solar Energy Guideline (2024)'.

Based on the assumptions and parameters for Scenario 1 (refer to **Section 2.5**), the findings of the assessment are as follows:

A total of 57 residential receptors were identified within the 3 km Study Area. Of these, 20 receptors were identified with the potential to experience moderate levels of 'green' glare and require mitigation. 'Yellow' glare impacts were also predicted for seven (7) receptors; however, the level of impact is considered low and does not require mitigation.

Two (2) road receptors, Kooringaroo Road and Windellama Road, were identified within 1 km of the PV Array Area. No rail receptors were identified. Assessment in Scenario 1 indicated that both the Kooringaroo Road may experience moderate 'yellow' glare impacts, and requires mitigation.

One landing strip was idenitifed within the 5 km Study Area. No glare impacts are predicted for the two flight paths associated with the landing strip. Therefore, no mitigation is required.

To mitigate against glare for the affected section of Kooringaroo Road, a 5m landscape screening buffer along the eastern and north-eastern boundary of PV Array 11, as outlined in the Lightsource bp Project layout is recommended. This landscape screen buffer includes a 5-metre-wide zone of screening vegetation on-site, strategically positioned to effectively fragment and mitigate potential glare impacts from the Project, particularly along Kooringaroo Road.

Additionally, Moir Studio has undertaken a supplementary mitigation assessment (Scenario 2) modelling an alternate resting angle of 22° to reduce potential glare. Scenario 2 represents a conservative, worst-case scenario to demonstrate the potential effectiveness of this mitigation. As outlined in **Section 8.1.1** and detailed in **Appendix B**, this measure has been shown to eliminate all instances of glare.

In conclusion, the Project aligns with the Guideline requirements when mitigation measures identified in this assessment, as outlined above, are implemented.

References

Austroads Ltd. 2021, Guide to Road Design Part 3: Geometric Design, AGRD03-16, Austroads Ltd., Sydney, NSW.

Australian Rail Track Corporation Limited 2010, Signal Sighting and Position, ESC-04-01, Australian Rail Track Corporation Limited, Sydney.

Doubleday, K., Choi, B., Maksimovic, D., Deline, C., & Olalla, C. (2016). Recovery of inter-row shading losses using differential power-processing submodule DC–DC converters. Solar Energy, 135, 512-517.

ForgeSolar n.d., www.forgesolar.com, viewed 21 February 2023, <https://www.forgesolar.com/help/#glare>.

Federal Aviation Administration (2021). Final Policy, Review of Solar Energy System Projects on Federally Obligated Airports. Document Number 2021-09862.

Ho, C. K., Ghanbari, C. M., and Diver, R. B., 2011, "Methodology to Assess Potential Glint and Glare Hazards From Concentrating Solar Power Plants: Analytical Models and Experimental Validation", ASME J. Sol. Energy Eng., 133.

NSW Department of Planning, Housing and Infrastructure, Large-Scale Solar Energy Guideline, November 2024

NSW Department of Planning, Housing and Infrastructure, Large-Scale Solar Energy Guideline-Technical Supplement - Landscape and Visual Impact Assessment, November 2024

Rogers, J. A., et al. (2015). "Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach", Federal Aviation Administration (link)

Transport Asset Standards Authority 2020, Minimum Operating Standards for Rolling Stock – General Interface Requirements, T HR RS 00100 ST, Transport NSW, Sydney.

Glint & Glare Appendix A
Scenario 1

FORGESOLAR GLARE ANALYSIS

Project: **2321 GUNDARY SOLAR FARM**
Site configuration: **2321 GUNDARY SF A**

Client: UMWELT

Created 11 May, 2023
Updated 05 Sep, 2023
Time-step 1 minute
Timezone offset UTC10
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 90321.15924

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
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	478	8.0	546	9.1	-
PV array 10	SA tracking	SA tracking	8,276	137.9	1,001	16.7	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	723	12.1	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	2,969	49.5	0	0.0	-
PV array 4	SA tracking	SA tracking	1,169	19.5	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	3,314	55.2	0	0.0	-
PV array 7	SA tracking	SA tracking	5,482	91.4	633	10.6	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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.

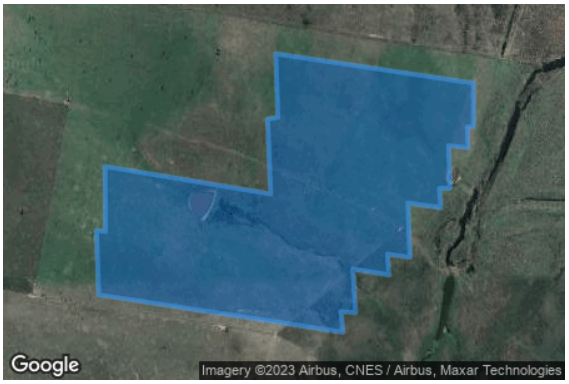
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	5,734	95.6	1,001	16.7
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	618	10.3	0	0.0
OP 3	544	9.1	0	0.0
OP 4	0	0.0	0	0.0
OP 5	261	4.3	0	0.0
OP 6	622	10.4	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 7	964	16.1	0	0.0
OP 8	1,564	26.1	0	0.0
OP 9	363	6.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	465	7.8	0	0.0
OP 23	659	11.0	0	0.0
OP 24	747	12.4	0	0.0
OP 25	752	12.5	0	0.0
OP 26	1,231	20.5	546	9.1
OP 27	696	11.6	0	0.0
OP 28	689	11.5	142	2.4
OP 29	621	10.3	283	4.7
OP 30	1,219	20.3	39	0.7
OP 31	1,255	20.9	24	0.4
OP 32	157	2.6	0	0.0
OP 33	343	5.7	0	0.0
OP 34	348	5.8	0	0.0
OP 35	186	3.1	0	0.0
OP 36	0	0.0	0	0.0
OP 37	880	14.7	0	0.0
OP 38	169	2.8	0	0.0
OP 39	647	10.8	0	0.0
OP 40	677	11.3	145	2.4

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840456	149.755350	675.25	1.95	677.20
2	-34.840842	149.758197	672.75	1.95	674.70
3	-34.839794	149.758144	676.52	1.95	678.47
4	-34.839764	149.758322	676.87	1.95	678.82
5	-34.838872	149.758283	677.61	1.95	679.56
6	-34.839286	149.761683	652.30	1.95	654.25
7	-34.839897	149.761681	652.06	1.95	654.01
8	-34.839903	149.761575	653.51	1.95	655.46
9	-34.840194	149.761589	652.81	1.95	654.76
10	-34.840164	149.761253	656.23	1.95	658.18
11	-34.840764	149.761281	653.53	1.95	655.48
12	-34.840764	149.761097	654.88	1.95	656.83
13	-34.841036	149.761122	652.81	1.95	654.76
14	-34.840969	149.760553	656.86	1.95	658.81
15	-34.841733	149.760592	651.87	1.95	653.82
16	-34.841689	149.760203	655.00	1.95	656.95
17	-34.841981	149.760231	653.26	1.95	655.21
18	-34.841897	149.759608	659.68	1.95	661.63
19	-34.842511	149.759658	657.56	1.95	659.51
20	-34.842497	149.759408	659.19	1.95	661.14
21	-34.842786	149.759439	658.50	1.95	660.45
22	-34.842261	149.755242	679.24	1.95	681.19
23	-34.841353	149.755203	676.42	1.95	678.37
24	-34.841369	149.755361	676.81	1.95	678.76

Name: PV array 10
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858406	149.770000	655.09	1.95	657.04
2	-34.859275	149.776911	670.07	1.95	672.02
3	-34.858694	149.776881	667.72	1.95	669.67
4	-34.858422	149.777164	667.36	1.95	669.31
5	-34.858517	149.777869	669.53	1.95	671.48
6	-34.857853	149.777822	668.66	1.95	670.61
7	-34.857567	149.778106	669.19	1.95	671.14
8	-34.857733	149.779386	673.06	1.95	675.01
9	-34.858044	149.779392	674.91	1.95	676.86
10	-34.858317	149.781619	676.41	1.95	678.36
11	-34.859039	149.781789	677.78	1.95	679.73
12	-34.859308	149.781792	679.96	1.95	681.91
13	-34.859375	149.782231	679.89	1.95	681.84
14	-34.859536	149.782239	681.33	1.95	683.28
15	-34.859567	149.782506	681.61	1.95	683.56
16	-34.860022	149.782522	686.44	1.95	688.39
17	-34.860122	149.783111	688.43	1.95	690.38
18	-34.859500	149.783086	682.00	1.95	683.95
19	-34.859569	149.783803	683.21	1.95	685.16
20	-34.859289	149.783789	681.37	1.95	683.32
21	-34.859447	149.785550	682.53	1.95	684.48
22	-34.858550	149.785517	679.87	1.95	681.82
23	-34.858550	149.785744	680.18	1.95	682.13
24	-34.857958	149.785717	677.91	1.95	679.86
25	-34.858142	149.787292	680.38	1.95	682.33
26	-34.858758	149.787306	683.68	1.95	685.63
27	-34.858850	149.787914	683.32	1.95	685.27
28	-34.859147	149.787919	684.39	1.95	686.34
29	-34.859217	149.788481	683.00	1.95	684.95
30	-34.859839	149.788483	684.87	1.95	686.82
31	-34.859889	149.788428	685.10	1.95	687.05
32	-34.860054	149.788430	685.75	1.95	687.70
33	-34.860358	149.788434	687.01	1.95	688.96
34	-34.860727	149.788435	688.51	1.95	690.46
35	-34.861000	149.788452	689.51	1.95	691.46
36	-34.861206	149.788459	689.25	1.95	691.20
37	-34.861380	149.788465	689.05	1.95	691.00
38	-34.861585	149.788469	688.82	1.95	690.77
39	-34.861731	149.788458	689.04	1.95	690.99
40	-34.861660	149.787962	691.38	1.95	693.33
41	-34.861623	149.787682	693.41	1.95	695.36
42	-34.861578	149.787337	694.64	1.95	696.59
43	-34.861491	149.786699	694.22	1.95	696.17
44	-34.861439	149.786264	691.51	1.95	693.46
45	-34.861253	149.784794	688.21	1.95	690.16
46	-34.861211	149.784530	689.95	1.95	691.90
47	-34.861151	149.784191	691.97	1.95	693.92
48	-34.861125	149.784062	692.51	1.95	694.46
49	-34.861102	149.783899	693.26	1.95	695.21
50	-34.861085	149.783822	693.65	1.95	695.60
51	-34.861071	149.783685	694.25	1.95	696.20
52	-34.861043	149.783443	695.39	1.95	697.34
53	-34.859242	149.769586	655.35	1.95	657.30
54	-34.858619	149.769571	655.00	1.95	656.95
55	-34.858669	149.769994	655.22	1.95	657.17

Name: PV array 11
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854928	149.786786	682.51	1.95	684.46
2	-34.855153	149.788475	685.33	1.95	687.28
3	-34.855178	149.788637	684.59	1.95	686.54
4	-34.855197	149.788745	684.14	1.95	686.09
5	-34.855216	149.788878	683.68	1.95	685.63
6	-34.855257	149.789198	684.90	1.95	686.85
7	-34.855306	149.789552	687.26	1.95	689.21
8	-34.855581	149.791525	700.41	1.95	702.36
9	-34.854836	149.791494	701.31	1.95	703.26
10	-34.854864	149.791889	701.91	1.95	703.86
11	-34.854581	149.791869	701.25	1.95	703.20
12	-34.854628	149.792308	701.24	1.95	703.19
13	-34.854017	149.792292	699.50	1.95	701.45
14	-34.854047	149.792558	699.02	1.95	700.97
15	-34.853761	149.792550	699.97	1.95	701.92
16	-34.853831	149.793075	699.31	1.95	701.26
17	-34.854142	149.793086	698.06	1.95	700.01
18	-34.854433	149.795772	705.20	1.95	707.15
19	-34.855344	149.795817	705.80	1.95	707.75
20	-34.856011	149.795669	708.16	1.95	710.11
21	-34.856144	149.795500	709.31	1.95	711.26
22	-34.856744	149.795525	708.98	1.95	710.93
23	-34.856639	149.794693	710.56	1.95	712.51
24	-34.856929	149.794705	710.54	1.95	712.49
25	-34.856917	149.794600	710.75	1.95	712.70
26	-34.857533	149.794625	709.83	1.95	711.78
27	-34.857822	149.794578	709.08	1.95	711.03
28	-34.857867	149.794406	709.56	1.95	711.51
29	-34.858489	149.794442	706.20	1.95	708.15
30	-34.858772	149.794394	704.16	1.95	706.11
31	-34.858753	149.794222	704.23	1.95	706.18
32	-34.859358	149.794253	699.89	1.95	701.84
33	-34.859356	149.794136	699.89	1.95	701.84
34	-34.859644	149.794147	697.80	1.95	699.75
35	-34.859267	149.791322	687.69	1.95	689.64
36	-34.858947	149.791308	688.01	1.95	689.96
37	-34.858900	149.790925	685.57	1.95	687.52
38	-34.858286	149.790900	686.54	1.95	688.49
39	-34.858083	149.789519	683.80	1.95	685.75
40	-34.857792	149.789519	683.80	1.95	685.75
41	-34.857742	149.789139	683.25	1.95	685.20
42	-34.857125	149.789114	683.46	1.95	685.41
43	-34.857064	149.788703	682.21	1.95	684.16
44	-34.857678	149.788719	682.27	1.95	684.22
45	-34.857631	149.788367	681.25	1.95	683.20
46	-34.856964	149.788344	681.16	1.95	683.11
47	-34.856719	149.786636	678.00	1.95	679.95
48	-34.856106	149.786614	679.61	1.95	681.56
49	-34.855211	149.786697	681.71	1.95	683.66

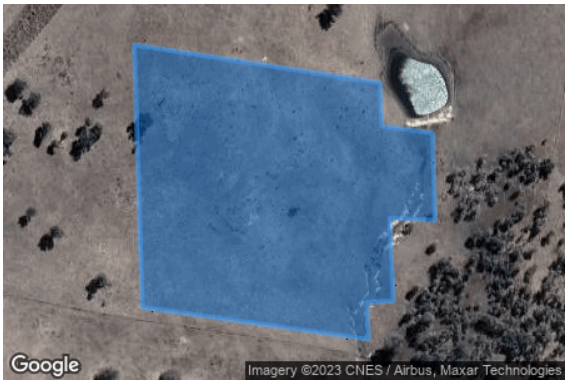
Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.859419	149.769711	655.67	1.95	657.62
2	-34.861188	149.783350	696.52	1.95	698.47
3	-34.861232	149.783715	695.09	1.95	697.04
4	-34.861282	149.784147	693.17	1.95	695.12
5	-34.861345	149.784637	689.71	1.95	691.66
6	-34.862506	149.793494	693.21	1.95	695.16
7	-34.863142	149.793542	694.26	1.95	696.21
8	-34.866122	149.792931	694.11	1.95	696.06
9	-34.865931	149.791367	702.04	1.95	703.99
10	-34.865333	149.791322	703.42	1.95	705.37
11	-34.865036	149.791375	703.20	1.95	705.15
12	-34.865019	149.791258	703.60	1.95	705.55
13	-34.864686	149.790997	703.23	1.95	705.18
14	-34.864553	149.789928	704.25	1.95	706.20
15	-34.863931	149.789911	701.83	1.95	703.78
16	-34.863808	149.789000	698.34	1.95	700.29
17	-34.864411	149.789019	700.24	1.95	702.19
18	-34.864303	149.788022	694.23	1.95	696.18
19	-34.864583	149.788039	694.66	1.95	696.61
20	-34.864439	149.786811	697.29	1.95	699.24
21	-34.865050	149.786856	697.08	1.95	699.03
22	-34.865314	149.786586	697.74	1.95	699.69
23	-34.865150	149.785300	694.98	1.95	696.93
24	-34.864858	149.785286	695.42	1.95	697.37
25	-34.864750	149.784472	695.43	1.95	697.38
26	-34.864730	149.784300	696.07	1.95	698.02
27	-34.864708	149.784110	696.73	1.95	698.68
28	-34.864983	149.784128	696.32	1.95	698.27
29	-34.864675	149.781517	703.05	1.95	705.00
30	-34.864367	149.781494	702.23	1.95	704.18
31	-34.864328	149.781228	700.18	1.95	702.13
32	-34.863703	149.781219	698.95	1.95	700.90
33	-34.863708	149.781372	700.44	1.95	702.39
34	-34.863419	149.781353	699.61	1.95	701.56
35	-34.863236	149.779844	691.61	1.95	693.56
36	-34.863519	149.779856	690.43	1.95	692.38
37	-34.863342	149.778442	682.56	1.95	684.51
38	-34.863936	149.778461	678.80	1.95	680.75
39	-34.863886	149.777744	674.62	1.95	676.57
40	-34.864161	149.777750	672.97	1.95	674.92
41	-34.864058	149.776792	667.31	1.95	669.26
42	-34.863769	149.776778	669.04	1.95	670.99
43	-34.863364	149.773750	660.53	1.95	662.48
44	-34.862753	149.773742	661.26	1.95	663.21
45	-34.862656	149.773025	660.60	1.95	662.55
46	-34.862372	149.773017	661.22	1.95	663.17
47	-34.862250	149.772294	661.76	1.95	663.71
48	-34.861636	149.772283	662.10	1.95	664.05
49	-34.861336	149.770414	657.93	1.95	659.88
50	-34.860978	149.770014	657.15	1.95	659.10
51	-34.860361	149.769983	656.71	1.95	658.66
52	-34.860352	149.769682	655.91	1.95	657.86

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.866069	149.791139	701.41	1.95	703.36
2	-34.866275	149.792711	694.92	1.95	696.87
3	-34.867181	149.792725	694.34	1.95	696.29
4	-34.867058	149.791775	696.40	1.95	698.35
5	-34.866747	149.791756	697.15	1.95	699.10
6	-34.866678	149.791158	699.92	1.95	701.87

Name: PV array 14
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864939	149.782561	702.09	1.95	704.04
2	-34.865206	149.784672	693.63	1.95	695.58
3	-34.865511	149.784689	693.01	1.95	694.96
4	-34.865558	149.785125	694.61	1.95	696.56
5	-34.866172	149.785147	693.39	1.95	695.34
6	-34.866156	149.784756	690.39	1.95	692.34
7	-34.866739	149.784789	688.82	1.95	690.77
8	-34.866747	149.784561	687.86	1.95	689.81
9	-34.867008	149.784575	686.24	1.95	688.19
10	-34.866783	149.782631	699.00	1.95	700.95

Name: PV array 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864660	149.778232	674.47	1.95	676.42
2	-34.864670	149.778331	675.34	1.95	677.29
3	-34.864680	149.778433	676.22	1.95	678.17
4	-34.864698	149.778569	677.49	1.95	679.44
5	-34.864713	149.778664	678.31	1.95	680.26
6	-34.864418	149.778643	677.80	1.95	679.75
7	-34.864425	149.778731	678.62	1.95	680.57
8	-34.865039	149.778767	680.03	1.95	681.98
9	-34.865042	149.778650	678.66	1.95	680.61
10	-34.865319	149.778669	678.68	1.95	680.63
11	-34.865292	149.778386	675.36	1.95	677.31
12	-34.865894	149.778403	674.05	1.95	676.00
13	-34.865903	149.778250	672.04	1.95	673.99
14	-34.866181	149.778256	670.94	1.95	672.89
15	-34.866158	149.778006	667.76	1.95	669.71
16	-34.865242	149.777983	670.58	1.95	672.53
17	-34.865254	149.778092	671.86	1.95	673.81
18	-34.864955	149.778101	672.70	1.95	674.65
19	-34.864652	149.778112	673.44	1.95	675.39

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.861793	149.789000	688.70	1.95	690.65
2	-34.862401	149.793651	693.05	1.95	695.00
3	-34.862093	149.793694	691.55	1.95	693.50
4	-34.861472	149.793673	688.72	1.95	690.67
5	-34.861217	149.791758	688.32	1.95	690.27
6	-34.860601	149.791725	686.00	1.95	687.95
7	-34.860556	149.791328	687.34	1.95	689.29
8	-34.860266	149.791334	687.14	1.95	689.09
9	-34.860143	149.790352	686.29	1.95	688.24
10	-34.859460	149.790336	683.76	1.95	685.71
11	-34.859302	149.789038	683.43	1.95	685.38
12	-34.859945	149.788957	684.94	1.95	686.89

Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853669	149.787596	691.34	1.95	693.29
2	-34.854597	149.787623	689.26	1.95	691.21
3	-34.854562	149.787377	687.65	1.95	689.60
4	-34.853644	149.787352	689.28	1.95	691.23

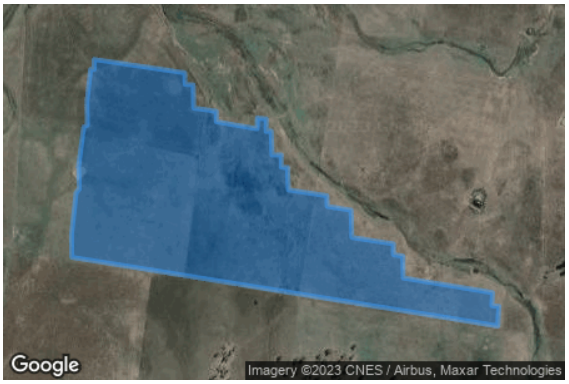
Name: PV array 5
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854681	149.788294	689.54	1.95	691.49
2	-34.854657	149.788044	689.39	1.95	691.34
3	-34.854036	149.788026	692.11	1.95	694.06
4	-34.854010	149.787787	691.97	1.95	693.92
5	-34.853389	149.787776	691.87	1.95	693.82
6	-34.853464	149.788267	693.88	1.95	695.83

Name: PV array 6
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

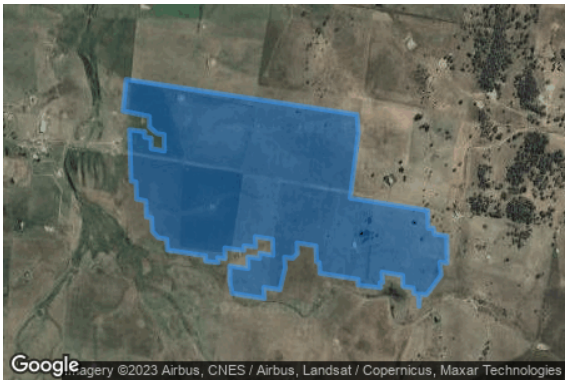
Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853629	149.789463	692.51	1.95	694.46
2	-34.854545	149.789498	688.36	1.95	690.31
3	-34.854551	149.789619	688.95	1.95	690.90
4	-34.855170	149.789627	687.82	1.95	689.77
5	-34.855020	149.788506	686.04	1.95	687.99
6	-34.854078	149.788476	691.03	1.95	692.98
7	-34.854096	149.788651	689.99	1.95	691.94
8	-34.853515	149.788637	692.65	1.95	694.60

Name: PV array 7
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858389	149.762044	654.78	1.95	656.73
2	-34.858763	149.765150	654.46	1.95	656.41
3	-34.859087	149.765169	655.94	1.95	657.89
4	-34.859107	149.765445	655.09	1.95	657.04
5	-34.859756	149.765464	657.08	1.95	659.03
6	-34.859846	149.766237	655.17	1.95	657.12
7	-34.860139	149.766237	655.26	1.95	657.21
8	-34.860337	149.767642	653.16	1.95	655.11
9	-34.860035	149.767650	652.68	1.95	654.63
10	-34.860060	149.767953	652.64	1.95	654.59
11	-34.860414	149.767951	653.24	1.95	655.19
12	-34.860401	149.768125	653.19	1.95	655.14
13	-34.861070	149.768155	654.66	1.95	656.61
14	-34.861072	149.768471	654.35	1.95	656.30
15	-34.861415	149.768471	655.30	1.95	657.25
16	-34.861426	149.768686	655.44	1.95	657.39
17	-34.862054	149.768715	656.53	1.95	658.48
18	-34.862219	149.770037	655.98	1.95	657.93
19	-34.862518	149.770054	657.26	1.95	659.21
20	-34.862624	149.770872	660.29	1.95	662.24
21	-34.863389	149.770896	664.47	1.95	666.42
22	-34.863570	149.772327	662.49	1.95	664.44
23	-34.863872	149.772327	664.38	1.95	666.33
24	-34.863916	149.772649	663.73	1.95	665.68
25	-34.864530	149.772662	667.21	1.95	669.16
26	-34.864941	149.775730	660.60	1.95	662.55
27	-34.865307	149.775709	661.69	1.95	663.64
28	-34.865324	149.775948	661.21	1.95	663.16
29	-34.865877	149.775910	664.14	1.95	666.09
30	-34.863949	149.761276	660.39	1.95	662.34
31	-34.863321	149.761262	658.42	1.95	660.37
32	-34.862142	149.761421	654.55	1.95	656.50
33	-34.862025	149.761536	654.61	1.95	656.56
34	-34.861411	149.761501	654.38	1.95	656.33
35	-34.860282	149.761686	655.50	1.95	657.45
36	-34.860234	149.761807	655.78	1.95	657.73
37	-34.859571	149.761793	654.80	1.95	656.75
38	-34.858667	149.761920	654.60	1.95	656.55
39	-34.858675	149.762038	654.78	1.95	656.73

Name: PV array 8
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.845411	149.763747	652.46	1.95	654.41
2	-34.847392	149.779619	707.21	1.95	709.16
3	-34.848408	149.779711	704.09	1.95	706.04
4	-34.852081	149.779147	685.99	1.95	687.94
5	-34.852786	149.784478	691.16	1.95	693.11
6	-34.853775	149.784508	691.71	1.95	693.66
7	-34.853775	149.784878	689.84	1.95	691.79
8	-34.854100	149.784925	690.53	1.95	692.48
9	-34.854219	149.785789	685.62	1.95	687.57
10	-34.855742	149.785800	682.29	1.95	684.24
11	-34.855683	149.785310	685.04	1.95	686.99
12	-34.856422	149.785389	681.50	1.95	683.45
13	-34.857511	149.784392	682.41	1.95	684.36
14	-34.857481	149.783917	687.18	1.95	689.13
15	-34.858167	149.783881	680.46	1.95	682.41
16	-34.857481	149.783808	688.31	1.95	690.26
17	-34.857436	149.783517	691.61	1.95	693.56
18	-34.857131	149.783481	694.73	1.95	696.68
19	-34.857050	149.782769	697.28	1.95	699.23
20	-34.856428	149.782753	702.34	1.95	704.29
21	-34.856247	149.781331	690.38	1.95	692.33
22	-34.856842	149.781372	686.61	1.95	688.56
23	-34.856842	149.781181	684.12	1.95	686.07
24	-34.857128	149.781225	681.30	1.95	683.25
25	-34.856967	149.779683	671.16	1.95	673.11
26	-34.856650	149.779697	671.81	1.95	673.76
27	-34.856311	149.777061	674.88	1.95	676.83
28	-34.855703	149.777025	677.46	1.95	679.41
29	-34.855667	149.776828	677.06	1.95	679.01
30	-34.854769	149.776781	677.81	1.95	679.76
31	-34.854597	149.775486	674.67	1.95	676.62
32	-34.855203	149.775514	675.51	1.95	677.46
33	-34.855472	149.775192	675.81	1.95	677.76
34	-34.855406	149.774631	673.87	1.95	675.82
35	-34.856003	149.774686	674.26	1.95	676.21
36	-34.857236	149.774311	667.81	1.95	669.76
37	-34.857097	149.773200	666.06	1.95	668.01
38	-34.857725	149.773250	663.66	1.95	665.61
39	-34.857439	149.771031	657.32	1.95	659.27
40	-34.856844	149.770881	658.78	1.95	660.73
41	-34.855897	149.770853	661.80	1.95	663.75
42	-34.856044	149.772136	665.70	1.95	667.65
43	-34.855386	149.772106	666.67	1.95	668.62
44	-34.855475	149.772917	667.66	1.95	669.61
45	-34.855178	149.772928	667.97	1.95	669.92
46	-34.855297	149.773847	670.37	1.95	672.32
47	-34.854400	149.773822	667.85	1.95	669.80
48	-34.854247	149.772617	670.96	1.95	672.91
49	-34.854831	149.772658	668.72	1.95	670.67
50	-34.854761	149.771839	667.26	1.95	669.21
51	-34.855033	149.771839	666.77	1.95	668.72
52	-34.854889	149.770528	663.03	1.95	664.98
53	-34.855489	149.770544	662.17	1.95	664.12
54	-34.855433	149.770022	661.56	1.95	663.51
55	-34.855714	149.770078	660.72	1.95	662.67
56	-34.855625	149.769203	659.64	1.95	661.59
57	-34.855331	149.769208	660.52	1.95	662.47
58	-34.855006	149.766578	654.49	1.95	656.44
59	-34.854394	149.766550	657.29	1.95	659.24

Name: PV array 9
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840718	149.772712	672.26	1.95	674.21
2	-34.840814	149.773442	671.97	1.95	673.92
3	-34.841456	149.773456	675.07	1.95	677.02
4	-34.841747	149.773419	676.57	1.95	678.52
5	-34.841731	149.773314	676.64	1.95	678.59
6	-34.842339	149.773342	678.44	1.95	680.39
7	-34.842631	149.773217	678.20	1.95	680.15
8	-34.842756	149.773061	677.22	1.95	679.17
9	-34.843378	149.773086	674.65	1.95	676.60
10	-34.843647	149.773042	673.22	1.95	675.17
11	-34.843625	149.772867	672.64	1.95	674.59
12	-34.844278	149.772897	670.46	1.95	672.41
13	-34.844536	149.772847	669.57	1.95	671.52
14	-34.844522	149.772678	668.82	1.95	670.77
15	-34.845225	149.772706	668.61	1.95	670.56
16	-34.845481	149.772669	668.60	1.95	670.55
17	-34.845486	149.772600	668.15	1.95	670.10
18	-34.846100	149.772636	668.91	1.95	670.86
19	-34.846103	149.772514	668.39	1.95	670.34
20	-34.846381	149.772536	668.80	1.95	670.75
21	-34.845264	149.763456	651.54	1.95	653.49
22	-34.844958	149.763439	651.17	1.95	653.12
23	-34.844922	149.763219	650.29	1.95	652.24
24	-34.843692	149.763178	648.91	1.95	650.86
25	-34.844175	149.766897	654.86	1.95	656.81
26	-34.844772	149.766933	655.27	1.95	657.22
27	-34.845303	149.771283	663.76	1.95	665.71
28	-34.844328	149.771242	664.76	1.95	666.71
29	-34.843819	149.767178	655.00	1.95	656.95
30	-34.843528	149.767169	655.11	1.95	657.06
31	-34.843097	149.763747	648.51	1.95	650.46
32	-34.842475	149.763756	648.01	1.95	649.96
33	-34.842494	149.764075	648.08	1.95	650.03
34	-34.841894	149.764058	648.00	1.95	649.95
35	-34.841903	149.764161	648.00	1.95	649.95
36	-34.841614	149.764144	647.51	1.95	649.46
37	-34.841956	149.767048	654.66	1.95	656.61
38	-34.840915	149.767103	652.33	1.95	654.28
39	-34.840928	149.767232	652.75	1.95	654.70
40	-34.840081	149.767326	653.68	1.95	655.63
41	-34.840302	149.769306	665.37	1.95	667.32
42	-34.840380	149.769919	668.21	1.95	670.16
43	-34.840484	149.770793	669.07	1.95	671.02
44	-34.840569	149.771476	669.92	1.95	671.87

Route Receptors

Name: Kooringaroo Road
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.844894	149.797785	700.88	2.40	703.28
2	-34.845405	149.797839	701.95	2.40	704.35
3	-34.845951	149.797839	703.24	2.40	705.64
4	-34.846461	149.797667	703.72	2.40	706.12
5	-34.847201	149.797324	703.91	2.40	706.31
6	-34.847958	149.797195	705.08	2.40	707.48
7	-34.849341	149.797324	704.87	2.40	707.27
8	-34.850441	149.797796	706.13	2.40	708.53
9	-34.851753	149.798514	706.49	2.40	708.89
10	-34.851939	149.798593	705.97	2.40	708.37
11	-34.852547	149.798599	705.19	2.40	707.59
12	-34.852771	149.798593	704.93	2.40	707.33
13	-34.853040	149.798615	704.39	2.40	706.79
14	-34.853405	149.798706	703.13	2.40	705.53
15	-34.853634	149.798856	701.27	2.40	703.67
16	-34.853753	149.799179	698.70	2.40	701.10
17	-34.854386	149.803824	706.81	2.40	709.21
18	-34.854440	149.803980	707.21	2.40	709.61
19	-34.854545	149.804131	707.69	2.40	710.09
20	-34.854779	149.804259	708.11	2.40	710.51
21	-34.856232	149.804463	705.67	2.40	708.07
22	-34.857038	149.804442	706.36	2.40	708.76
23	-34.857666	149.804434	709.30	2.40	711.70
24	-34.858094	149.804444	710.53	2.40	712.93
25	-34.858255	149.804528	710.98	2.40	713.38
26	-34.859954	149.805322	714.53	2.40	716.93
27	-34.860861	149.805901	718.87	2.40	721.27

Name: Windellama Road
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.834436	149.746048	677.52	2.40	679.92
2	-34.836286	149.745962	679.80	2.40	682.20
3	-34.839443	149.745632	678.70	2.40	681.10
4	-34.844828	149.744791	681.97	2.40	684.37
5	-34.846403	149.744502	680.38	2.40	682.78

Flight Path Receptors

Name: FP 1
Description:
Threshold height: 15 m
Direction: 223.8°
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	-34.805429	149.732106	636.07	15.24	651.31
Two-mile	-34.784578	149.756529	662.01	157.98	819.99

Name: FP 2
Description:
Threshold height: 15 m
Direction: 46.6°
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	-34.813216	149.721592	652.85	15.24	668.09
Two-mile	-34.833085	149.695979	659.64	177.14	836.78

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-34.883425	149.782499	678.14	1.50
OP 2	2	-34.877136	149.804446	725.31	1.50
OP 3	3	-34.859601	149.799602	695.53	1.50
OP 4	4	-34.858549	149.805847	717.10	1.50
OP 5	5	-34.857731	149.803540	709.27	1.50
OP 6	6	-34.855640	149.806088	719.97	1.50
OP 7	7	-34.850278	149.805584	728.28	1.50
OP 8	8	-34.851951	149.795252	724.46	1.50
OP 9	9	-34.846589	149.792266	723.70	1.50
OP 10	10	-34.828718	149.789979	689.94	1.50
OP 11	11	-34.828221	149.793890	702.36	1.50
OP 12	12	-34.817370	149.770320	675.10	1.50
OP 13	13	-34.818471	149.770658	674.38	1.50
OP 14	14	-34.819313	149.769430	671.09	1.50
OP 15	15	-34.831701	149.749292	678.80	1.50
OP 16	16	-34.831833	149.749689	678.33	1.50
OP 17	17	-34.831833	149.751459	668.36	1.50
OP 18	18	-34.832753	149.748745	680.80	1.50
OP 19	19	-34.834789	149.748397	669.25	1.50
OP 20	20	-34.834983	149.748166	669.30	1.50
OP 21	21	-34.836595	149.755113	673.20	1.50
OP 22	22	-34.844590	149.750204	683.40	1.50
OP 23	23	-34.851920	149.754485	667.64	1.50
OP 24	24	-34.844028	149.737691	706.23	1.50
OP 25	25	-34.848039	149.746730	694.73	1.50
OP 26	26	-34.847273	149.748334	696.18	1.50
OP 27	27	-34.847599	149.739714	689.48	1.50
OP 28	28	-34.851350	149.738663	686.00	1.50
OP 29	29	-34.852512	149.738963	685.00	1.50
OP 30	30	-34.854783	149.737118	696.95	1.50
OP 31	31	-34.856359	149.740187	682.37	1.50
OP 32	32	-34.871366	149.737596	678.33	1.50
OP 33	33	-34.875353	149.740535	675.81	1.50
OP 34	34	-34.877175	149.741179	677.38	1.50
OP 35	35	-34.870409	149.740978	672.18	1.50
OP 36	36	-34.818114	149.786580	698.85	1.50
OP 37	37	-34.851735	149.731624	682.75	1.50
OP 38	38	-34.872269	149.735245	679.71	1.50
OP 39	39	-34.847496	149.755791	666.00	1.50
OP 40	40	-34.853988	149.749772	670.60	1.50

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
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	478	8.0	546	9.1	-
PV array 10	SA tracking	SA tracking	8,276	137.9	1,001	16.7	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	723	12.1	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	2,969	49.5	0	0.0	-
PV array 4	SA tracking	SA tracking	1,169	19.5	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	3,314	55.2	0	0.0	-
PV array 7	SA tracking	SA tracking	5,482	91.4	633	10.6	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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
Kooringaroo Road	5,734	95.6	1,001	16.7
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	618	10.3	0	0.0
OP 3	544	9.1	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 4	0	0.0	0	0.0
OP 5	261	4.3	0	0.0
OP 6	622	10.4	0	0.0
OP 7	964	16.1	0	0.0
OP 8	1,564	26.1	0	0.0
OP 9	363	6.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	465	7.8	0	0.0
OP 23	659	11.0	0	0.0
OP 24	747	12.4	0	0.0
OP 25	752	12.5	0	0.0
OP 26	1,231	20.5	546	9.1
OP 27	696	11.6	0	0.0
OP 28	689	11.5	142	2.4
OP 29	621	10.3	283	4.7
OP 30	1,219	20.3	39	0.7
OP 31	1,255	20.9	24	0.4
OP 32	157	2.6	0	0.0
OP 33	343	5.7	0	0.0
OP 34	348	5.8	0	0.0
OP 35	186	3.1	0	0.0
OP 36	0	0.0	0	0.0
OP 37	880	14.7	0	0.0
OP 38	169	2.8	0	0.0
OP 39	647	10.8	0	0.0
OP 40	677	11.3	145	2.4

PV: PV array 1 potential temporary after-image

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 26	478	8.0	546	9.1
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 1 and Route: Kooringaroo Road

No glare found

PV array 1 and Route: Windellama Road

No glare found

PV array 1 and FP: FP 1

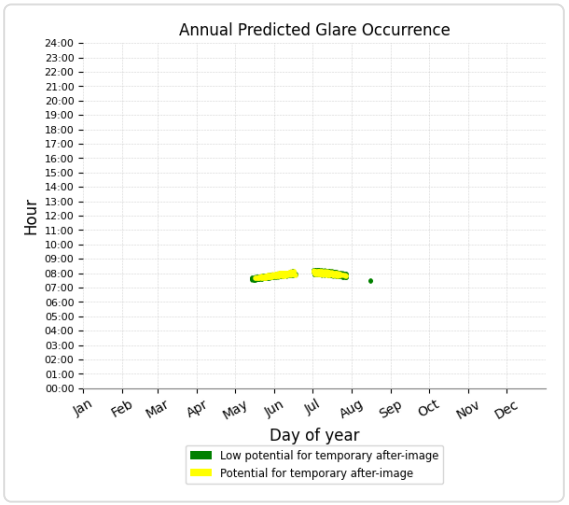
No glare found

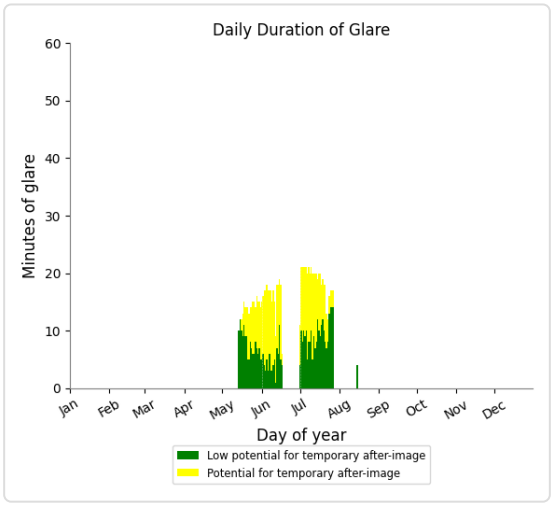
PV array 1 and FP: FP 2

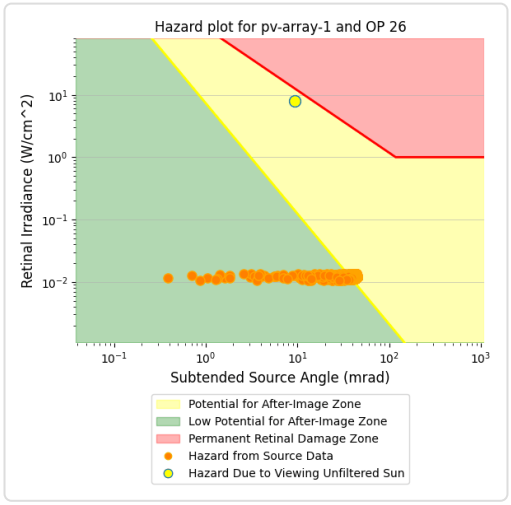
No glare found

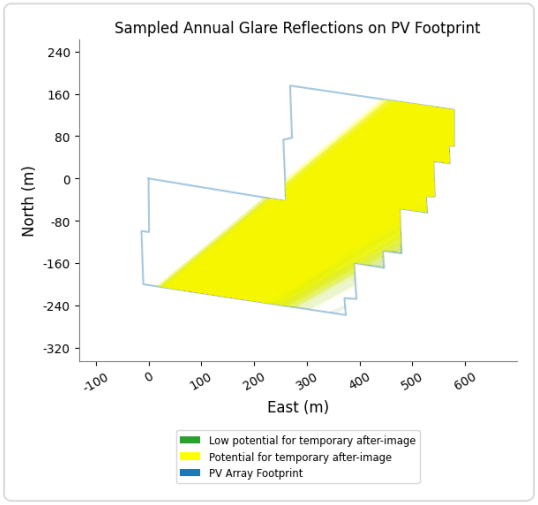
PV array 1 and OP 26

Yellow glare: 546 min.
Green glare: 478 min.









PV array 1 and OP 1

No glare found

PV array 1 and OP 2

No glare found

PV array 1 and OP 3

No glare found

PV array 1 and OP 4

No glare found

PV array 1 and OP 5

No glare found

PV array 1 and OP 6

No glare found

PV array 1 and OP 7

No glare found

PV array 1 and OP 8

No glare found

PV array 1 and OP 9

No glare found

PV array 1 and OP 10

No glare found

PV array 1 and OP 11

No glare found

PV array 1 and OP 12

No glare found

PV array 1 and OP 13

No glare found

PV array 1 and OP 14

No glare found

PV array 1 and OP 15

No glare found

PV array 1 and OP 16

No glare found

PV array 1 and OP 17

No glare found

PV array 1 and OP 18

No glare found

PV array 1 and OP 19

No glare found

PV array 1 and OP 20

No glare found

PV array 1 and OP 21

No glare found

PV array 1 and OP 22

No glare found

PV array 1 and OP 23

No glare found

PV array 1 and OP 24

No glare found

PV array 1 and OP 25

No glare found

PV array 1 and OP 27

No glare found

PV array 1 and OP 28

No glare found

PV array 1 and OP 29

No glare found

PV array 1 and OP 30

No glare found

PV array 1 and OP 31

No glare found

PV array 1 and OP 32

No glare found

PV array 1 and OP 33

No glare found

PV array 1 and OP 34

No glare found

PV array 1 and OP 35

No glare found

PV array 1 and OP 36

No glare found

PV array 1 and OP 37

No glare found

PV array 1 and OP 38

No glare found

PV array 1 and OP 39

No glare found

PV array 1 and OP 40

No glare found

PV: PV array 10 potential temporary after-image

Receptor results ordered by category of glare

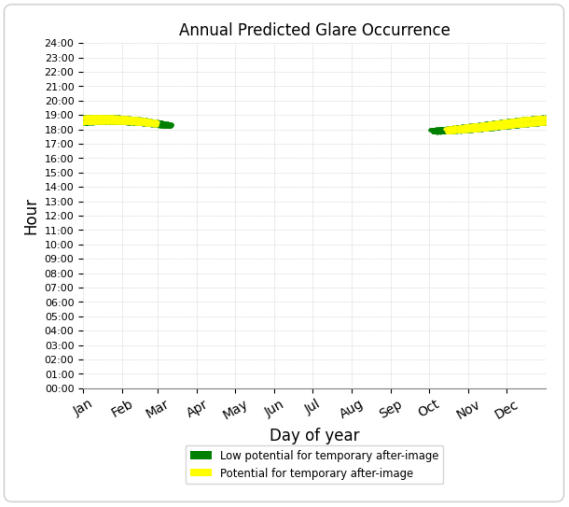
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	1,007	16.8	1,001	16.7
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 5	82	1.4	0	0.0
OP 6	400	6.7	0	0.0
OP 7	777	12.9	0	0.0
OP 8	1,001	16.7	0	0.0
OP 22	222	3.7	0	0.0
OP 23	583	9.7	0	0.0
OP 24	492	8.2	0	0.0
OP 25	547	9.1	0	0.0
OP 26	478	8.0	0	0.0
OP 27	524	8.7	0	0.0
OP 28	286	4.8	0	0.0
OP 29	333	5.5	0	0.0
OP 30	314	5.2	0	0.0
OP 31	223	3.7	0	0.0
OP 37	341	5.7	0	0.0
OP 39	331	5.5	0	0.0
OP 40	335	5.6	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 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 32	0	0.0	0	0.0

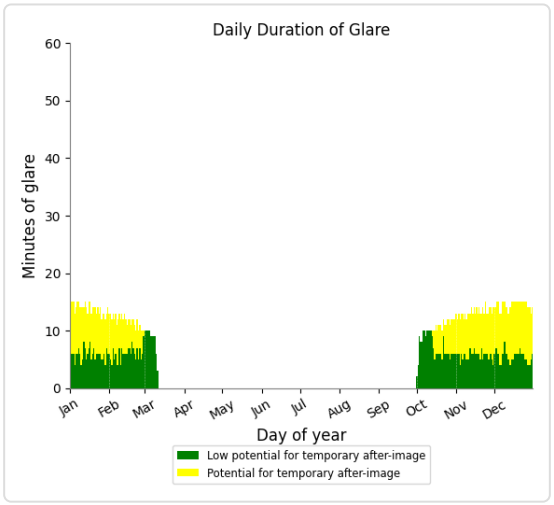
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 38	0	0.0	0	0.0

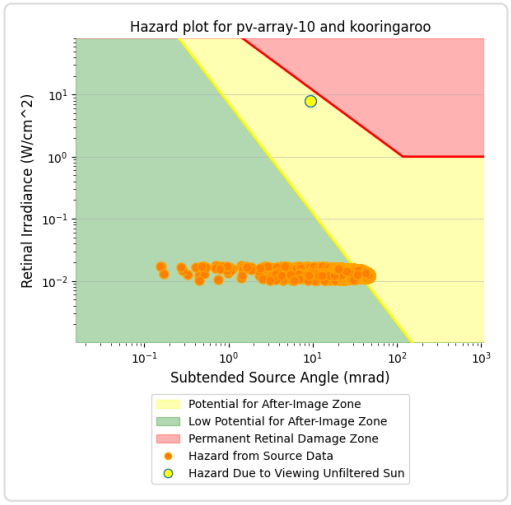
PV array 10 and Route: Kooringaroo Road

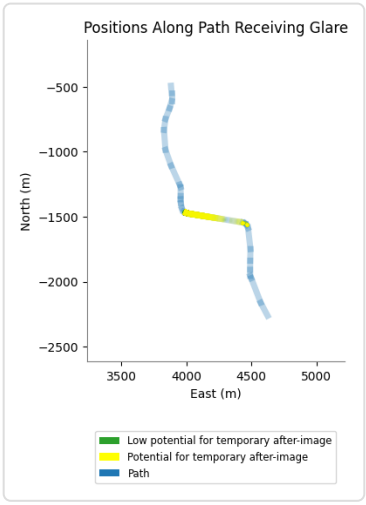
Yellow glare: 1,001 min.

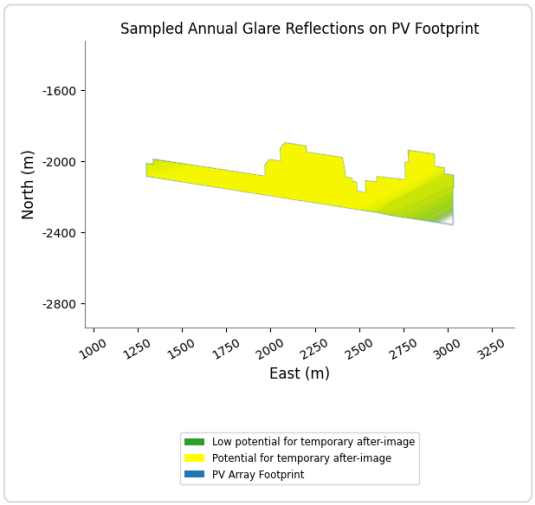
Green glare: 1,007 min.











PV array 10 and Route: Windellama Road

No glare found

PV array 10 and FP: FP 1

No glare found

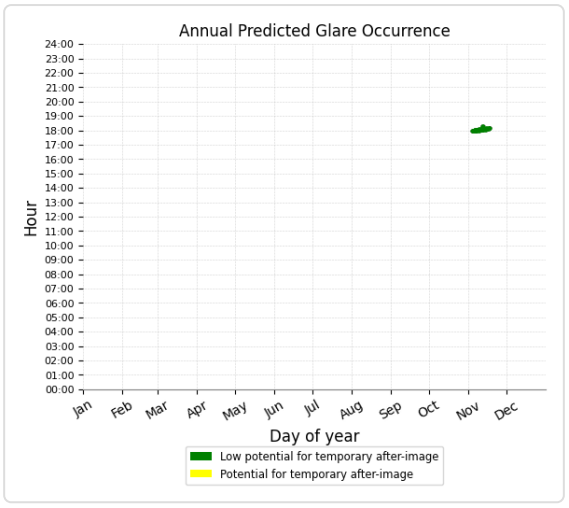
PV array 10 and FP: FP 2

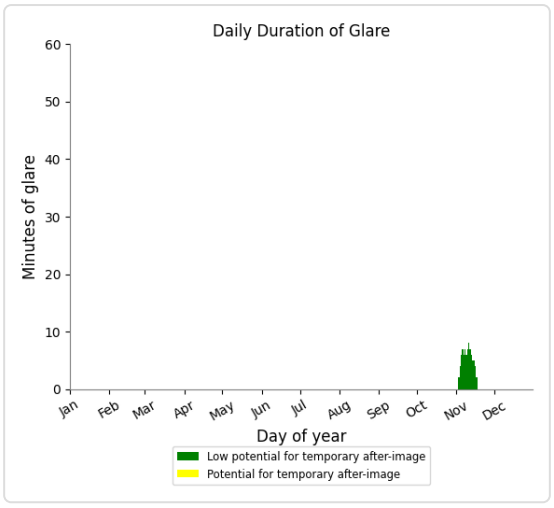
No glare found

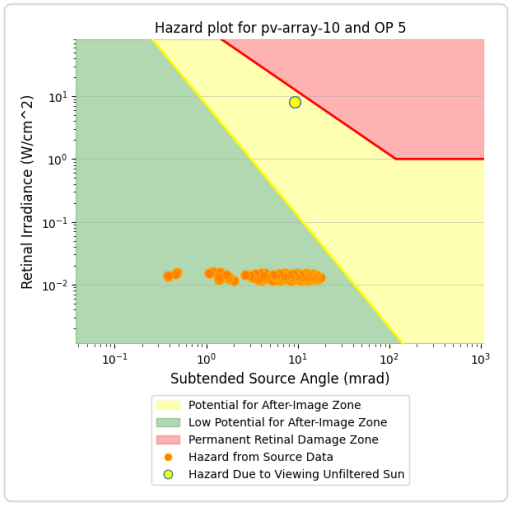
PV array 10 and OP 5

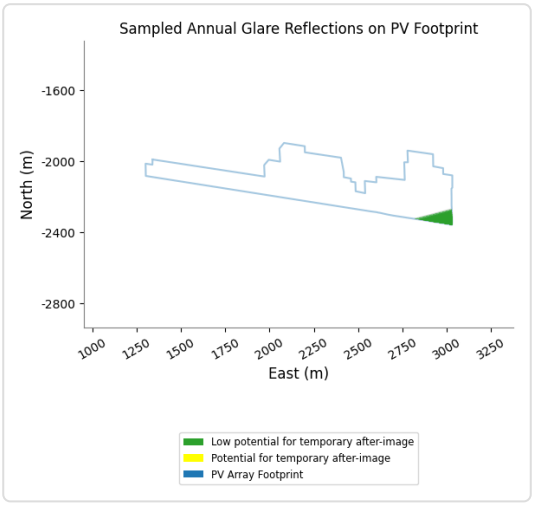
Yellow glare: none

Green glare: 82 min.





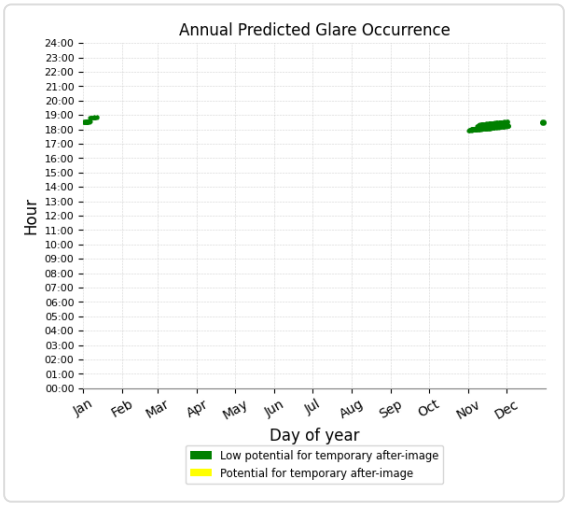


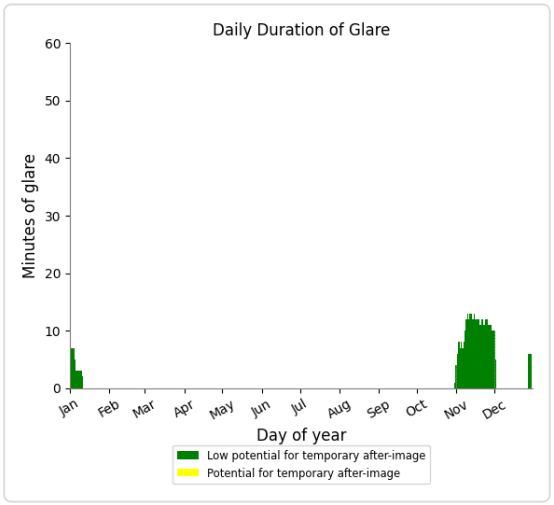


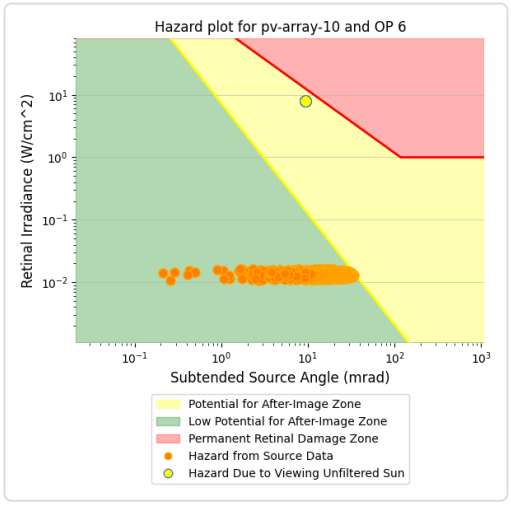
PV array 10 and OP 6

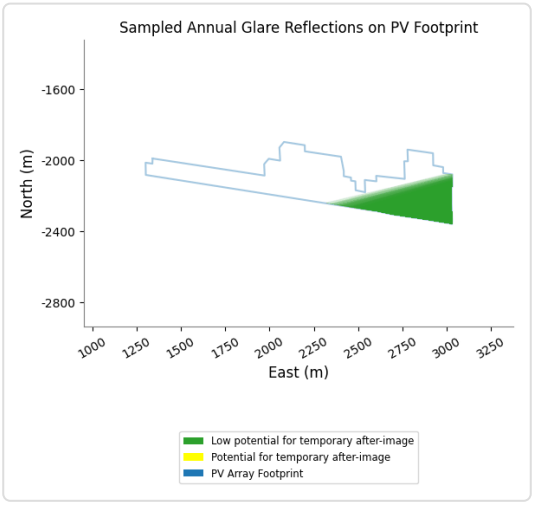
Yellow glare: none

Green glare: 400 min.





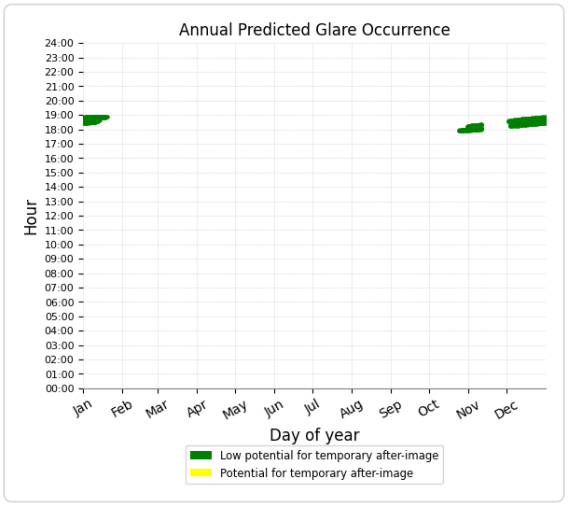


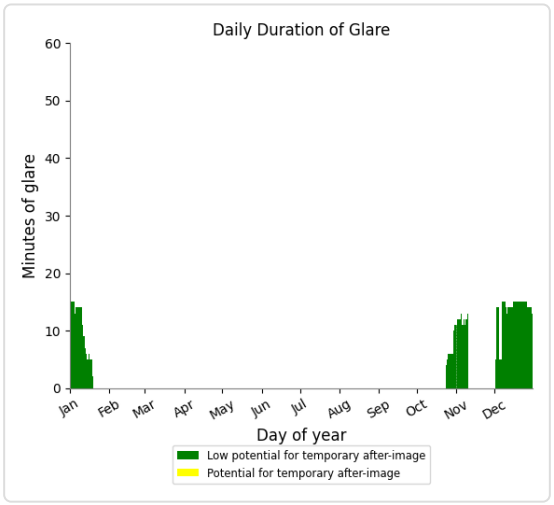


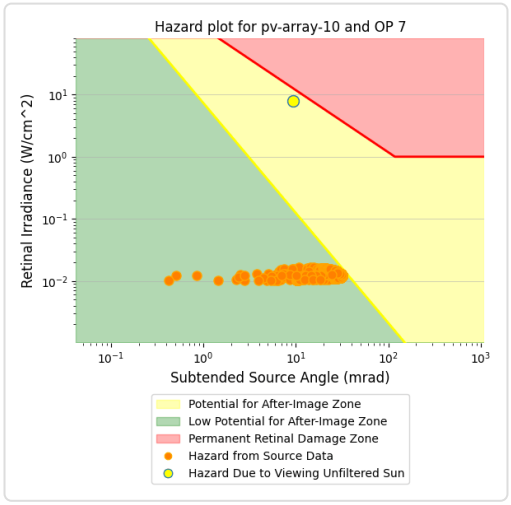
PV array 10 and OP 7

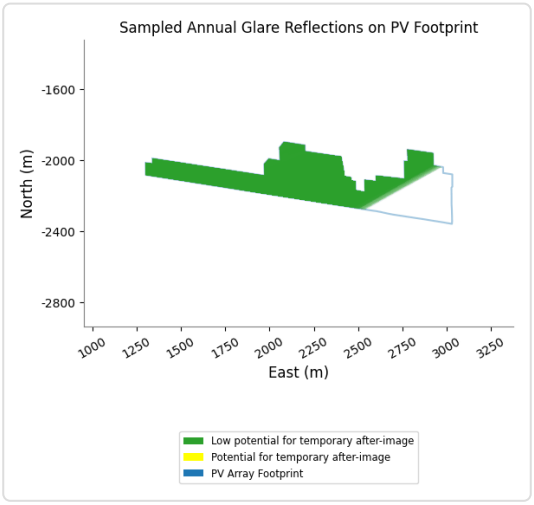
Yellow glare: none

Green glare: 777 min.





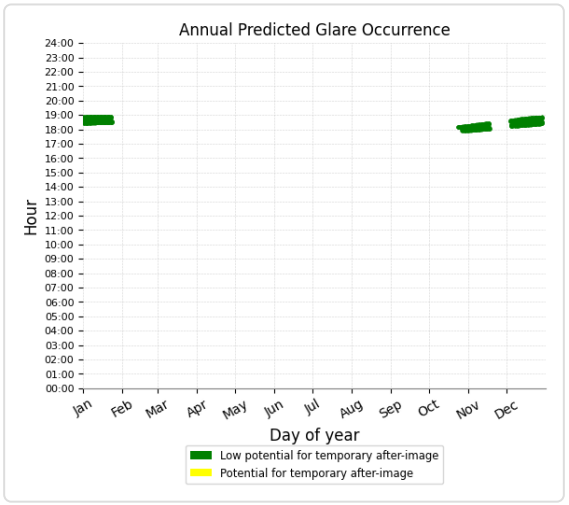


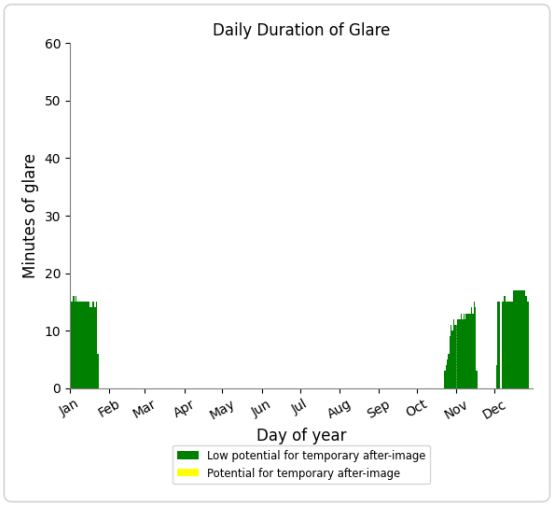


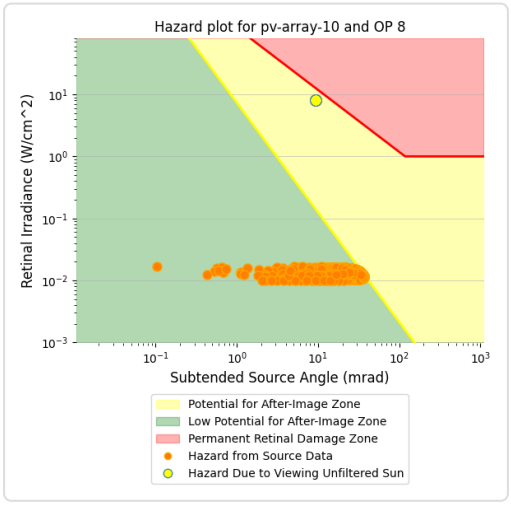
PV array 10 and OP 8

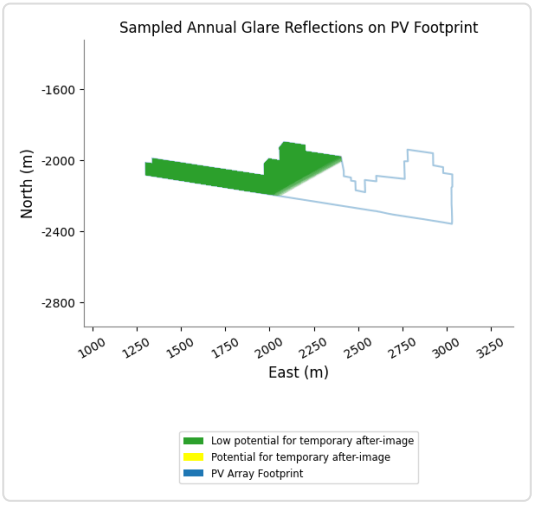
Yellow glare: none

Green glare: 1,001 min.





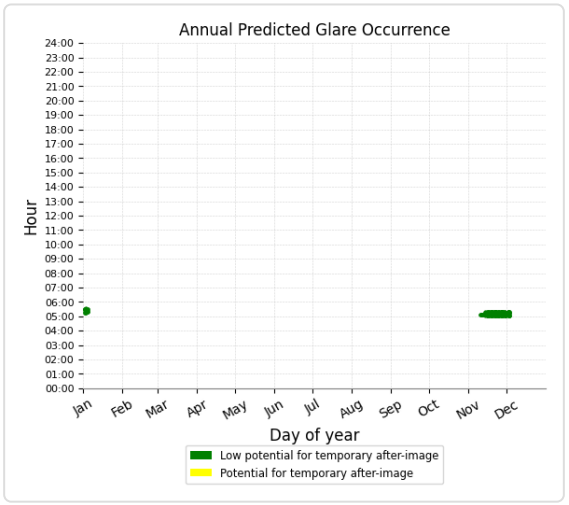


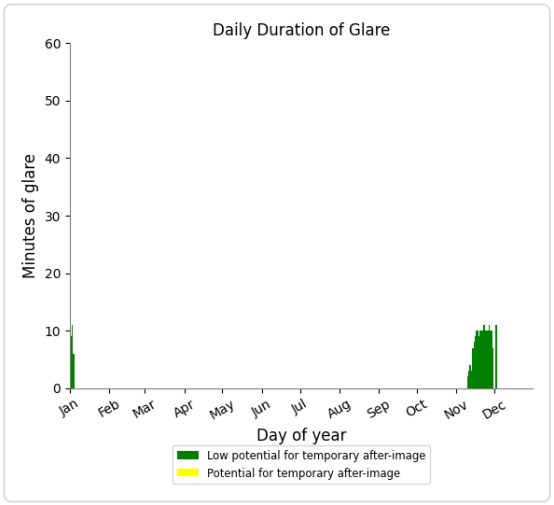


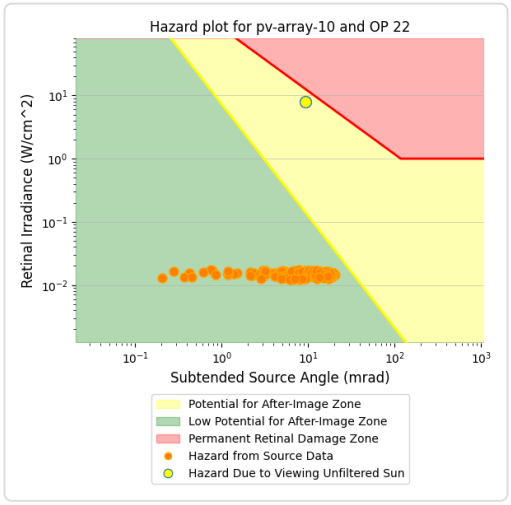
PV array 10 and OP 22

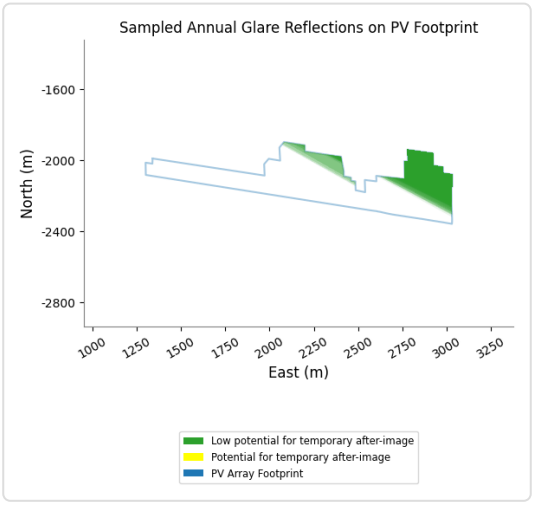
Yellow glare: none

Green glare: 222 min.





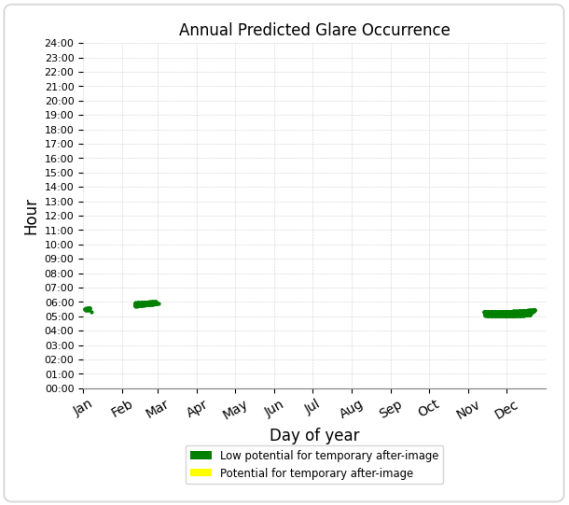


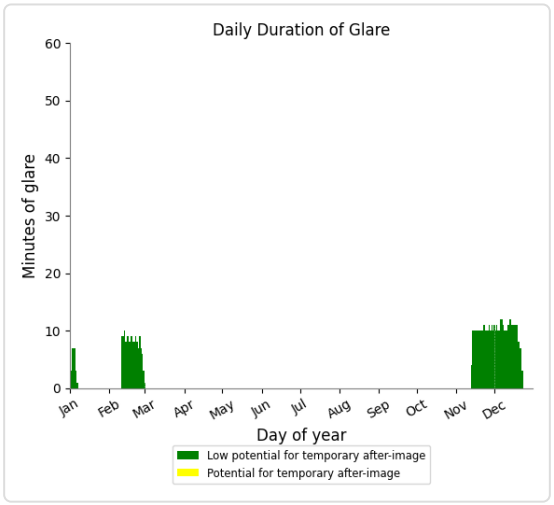


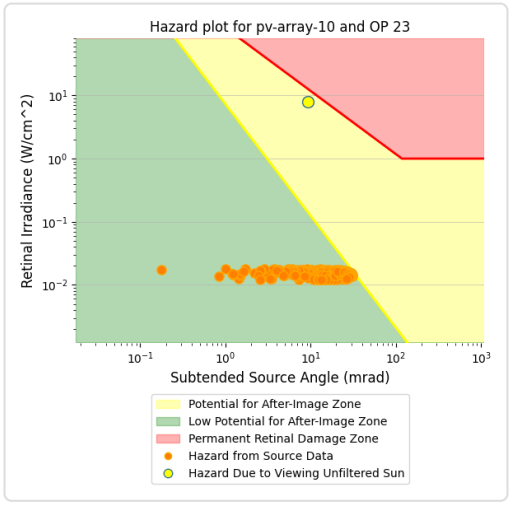
PV array 10 and OP 23

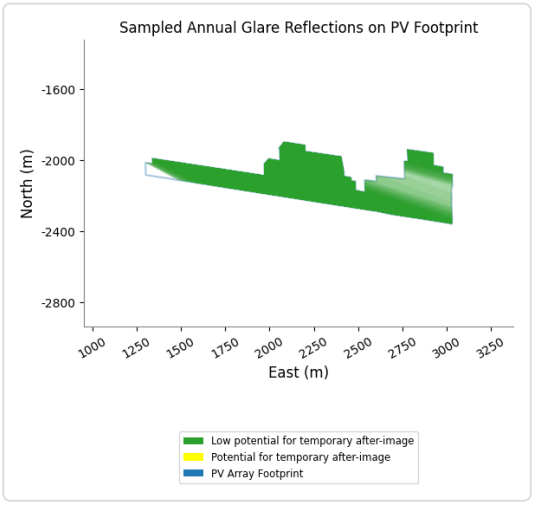
Yellow glare: none

Green glare: 583 min.





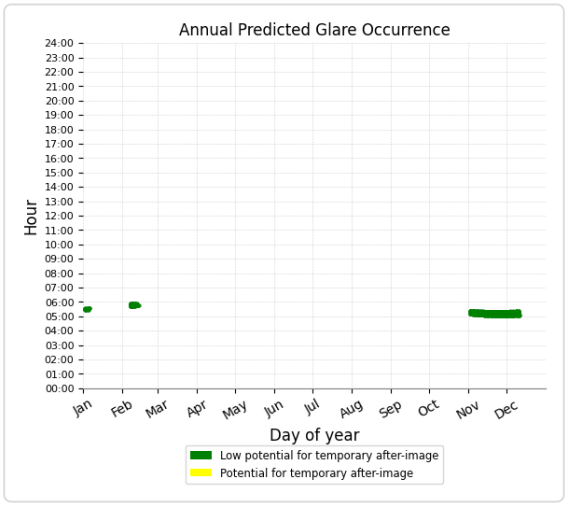


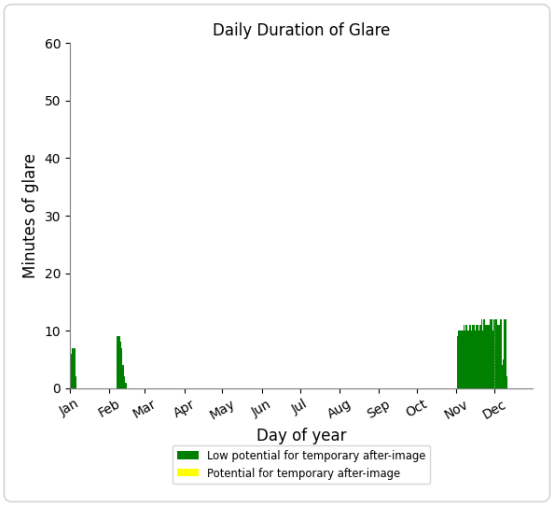


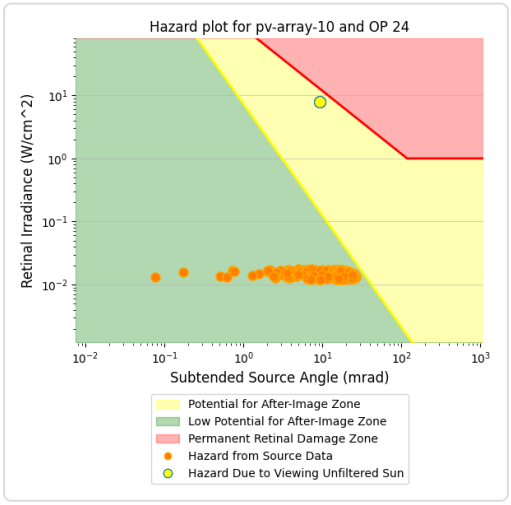
PV array 10 and OP 24

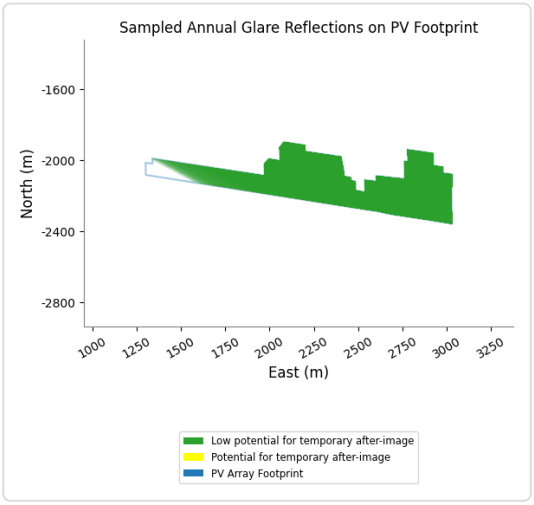
Yellow glare: none

Green glare: 492 min.





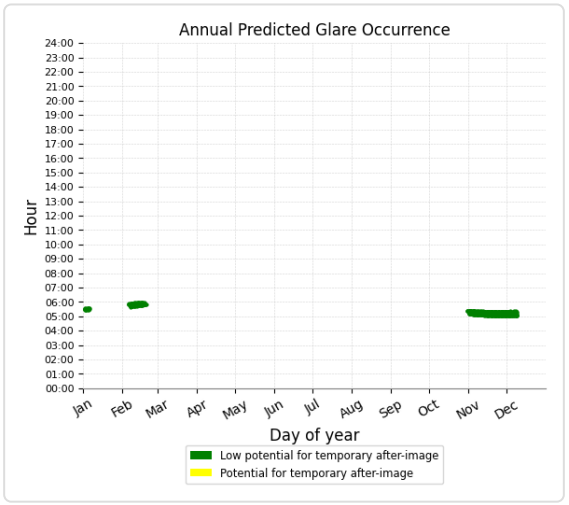


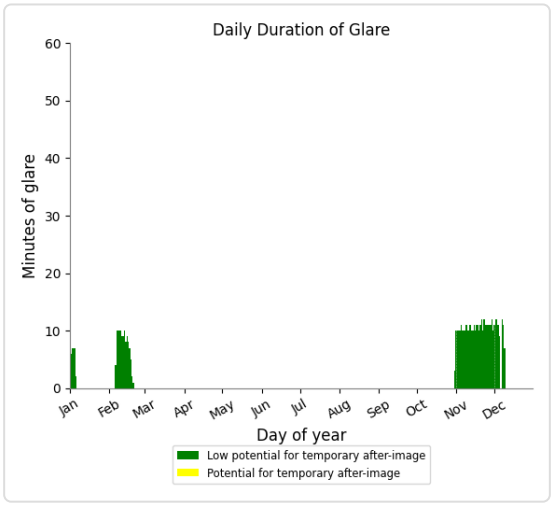


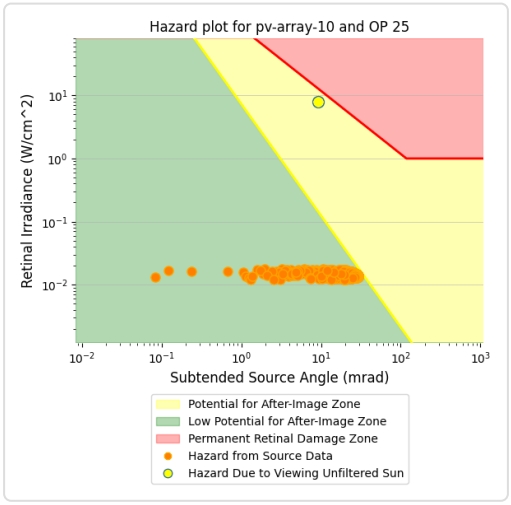
PV array 10 and OP 25

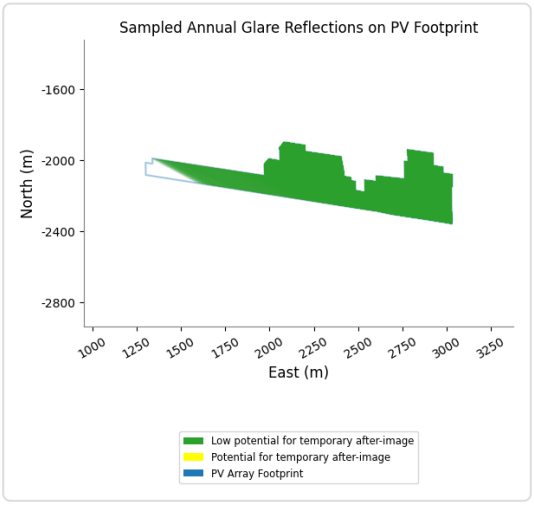
Yellow glare: none

Green glare: 547 min.





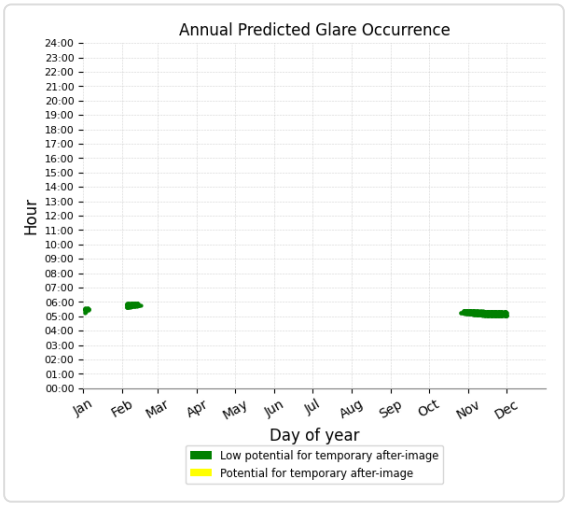


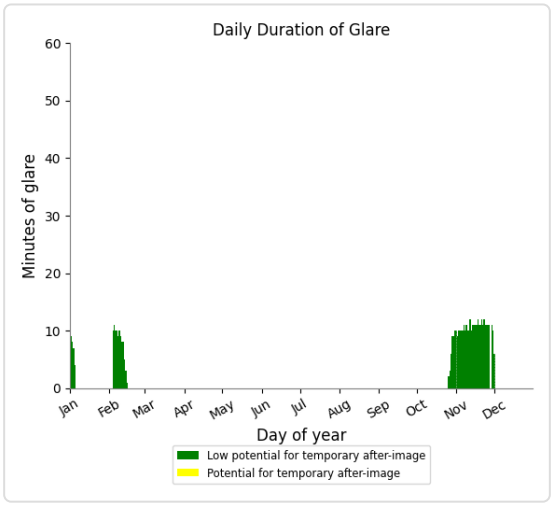


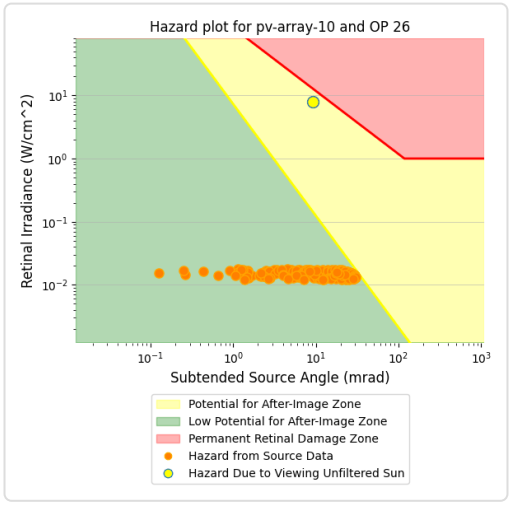
PV array 10 and OP 26

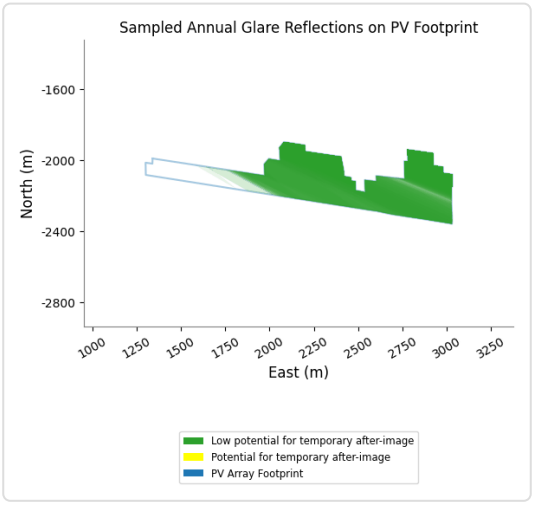
Yellow glare: none

Green glare: 478 min.





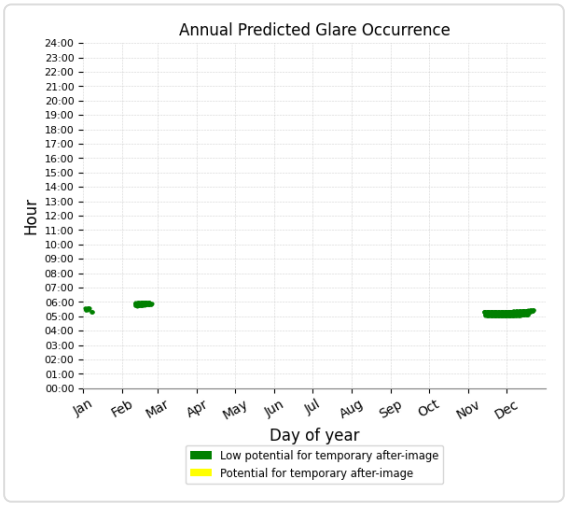


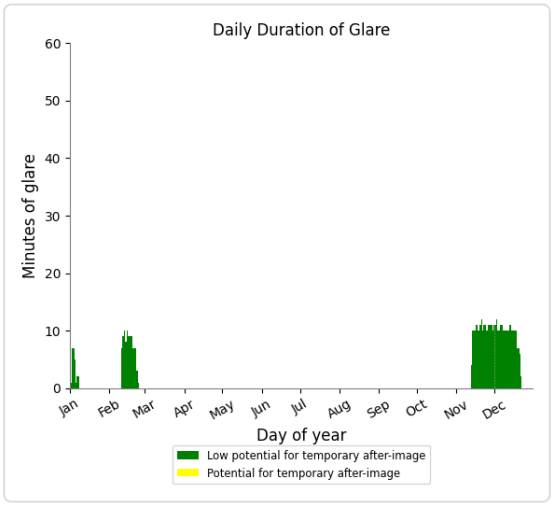


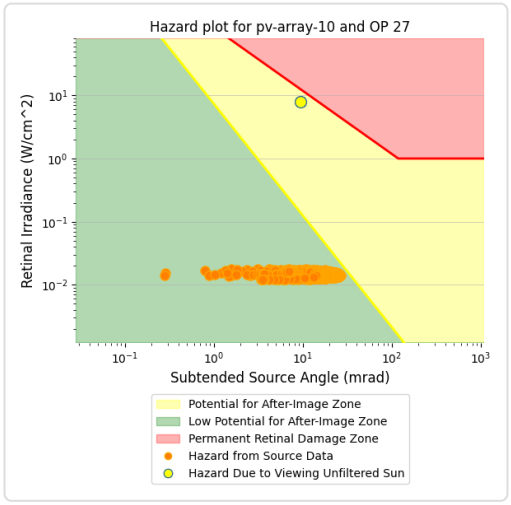
PV array 10 and OP 27

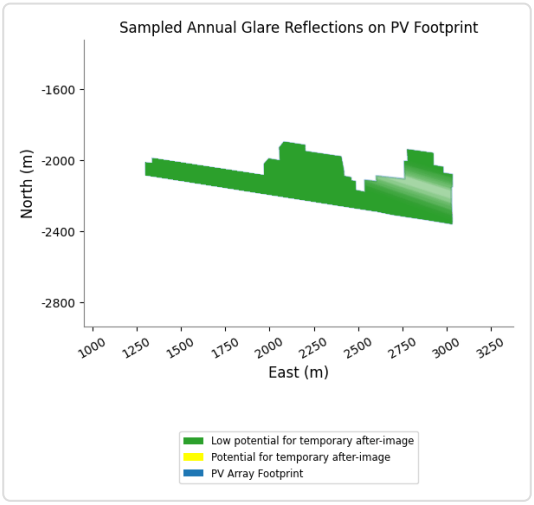
Yellow glare: none

Green glare: 524 min.





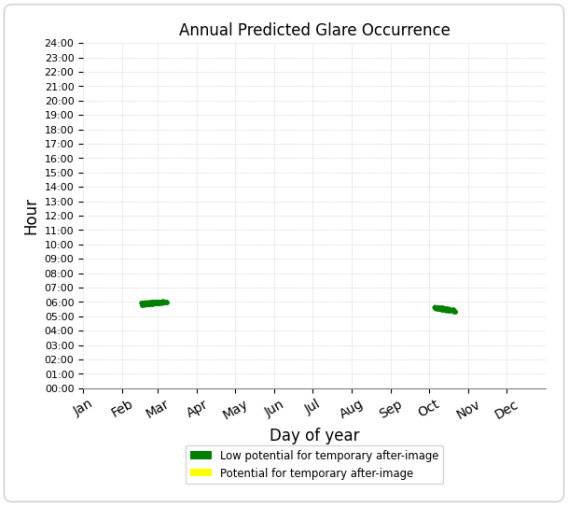


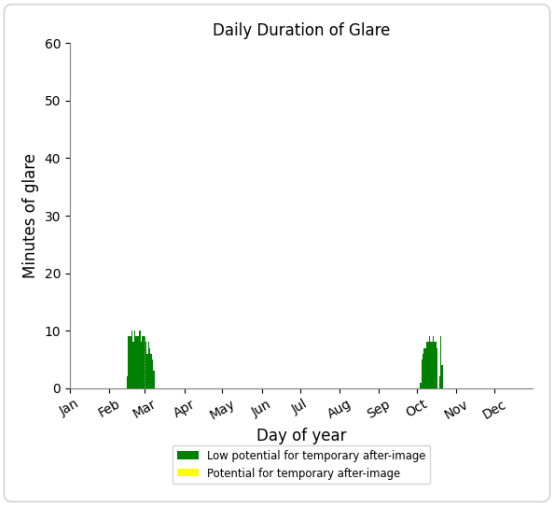


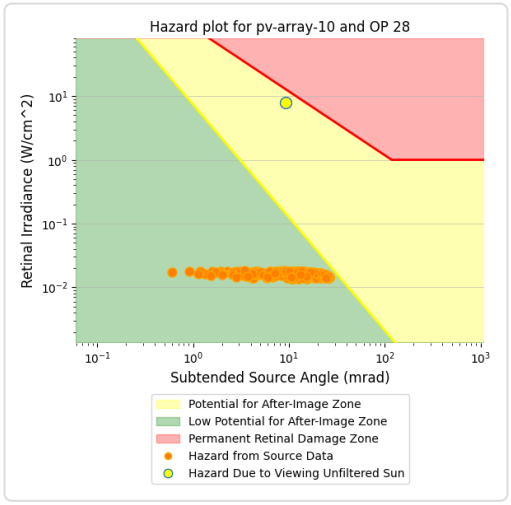
PV array 10 and OP 28

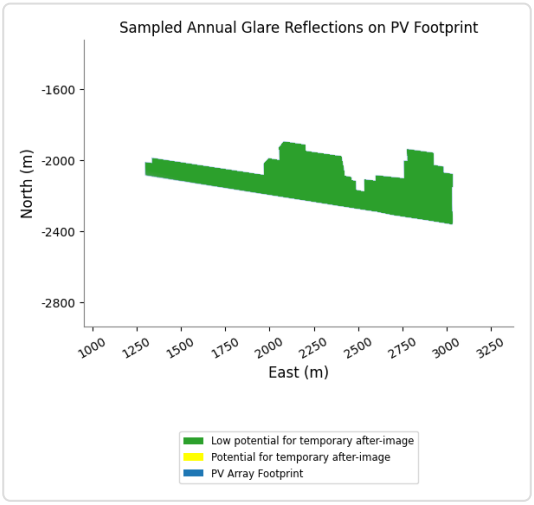
Yellow glare: none

Green glare: 286 min.





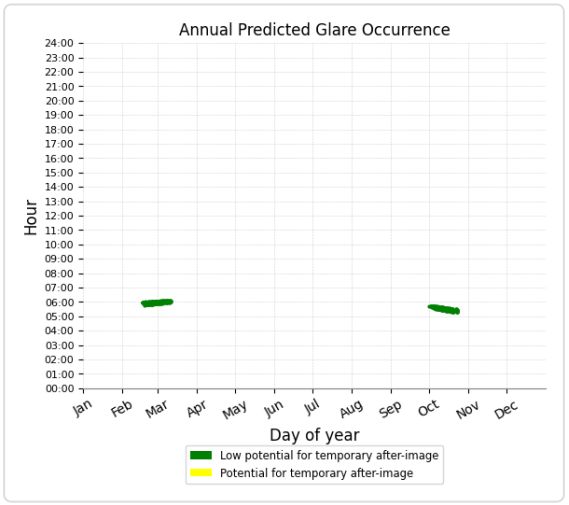


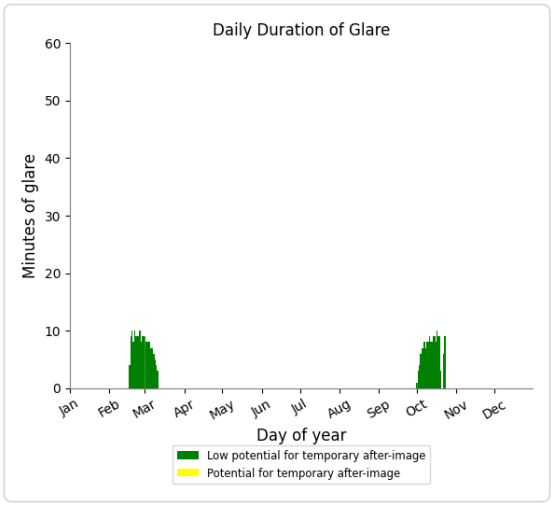


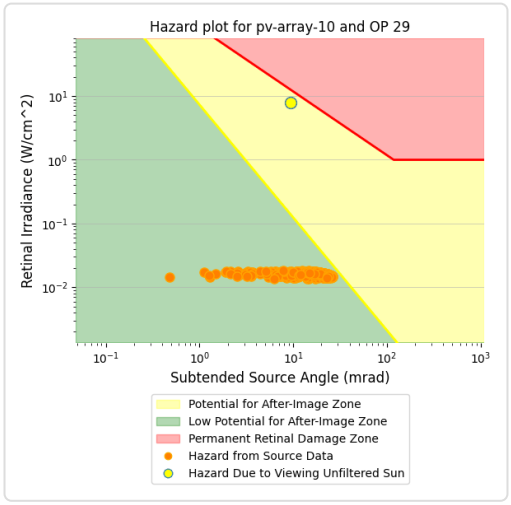
PV array 10 and OP 29

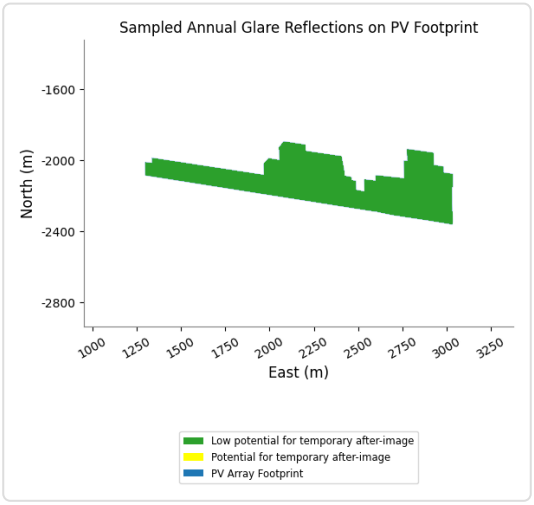
Yellow glare: none

Green glare: 333 min.





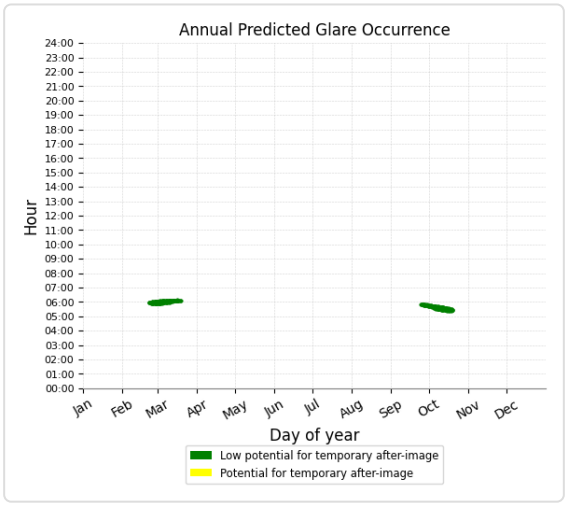


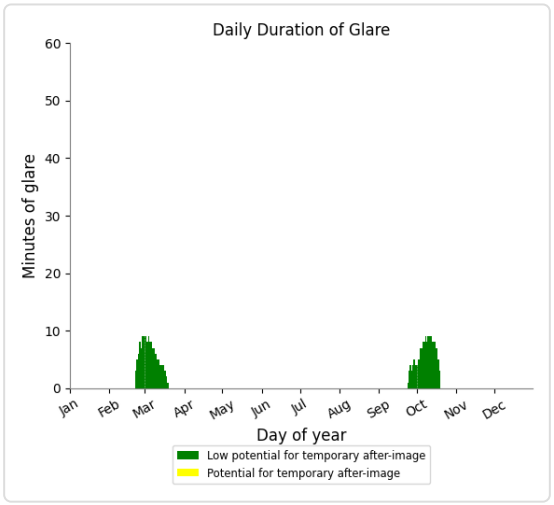


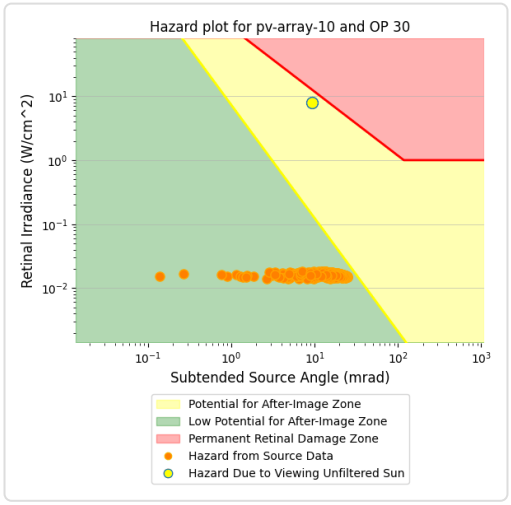
PV array 10 and OP 30

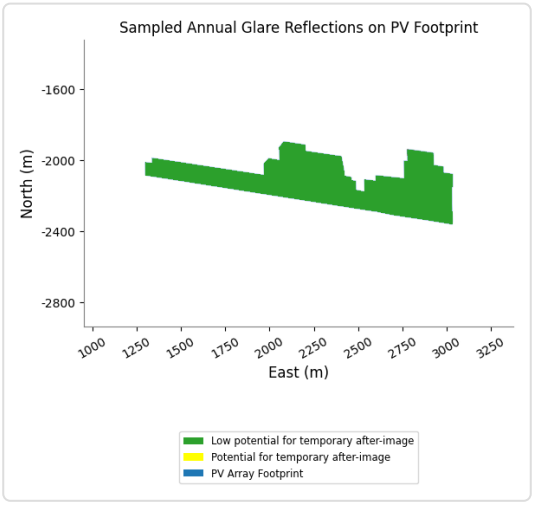
Yellow glare: none

Green glare: 314 min.





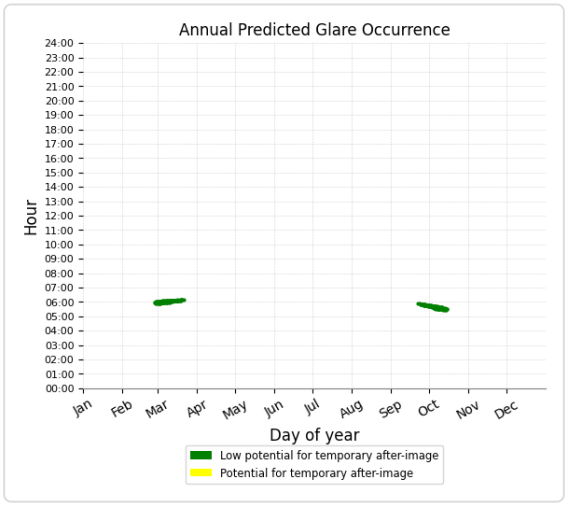


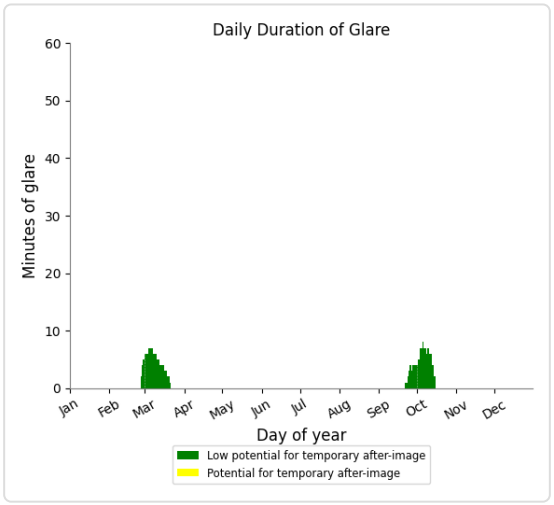


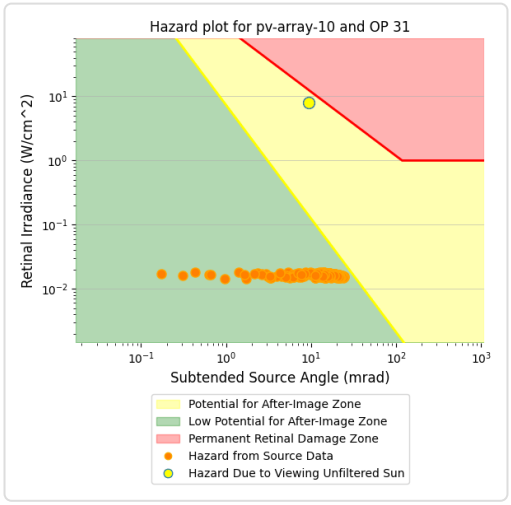
PV array 10 and OP 31

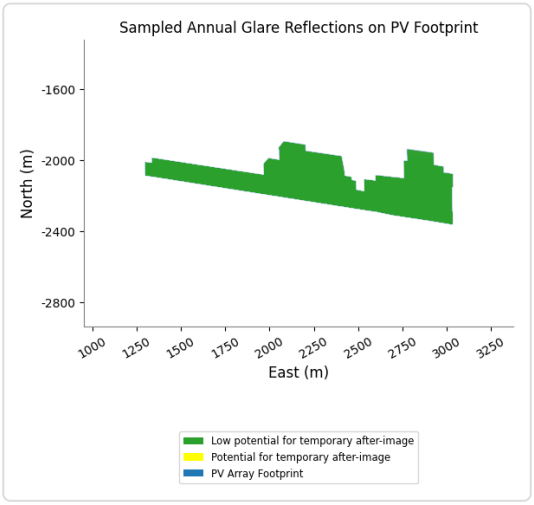
Yellow glare: none

Green glare: 223 min.





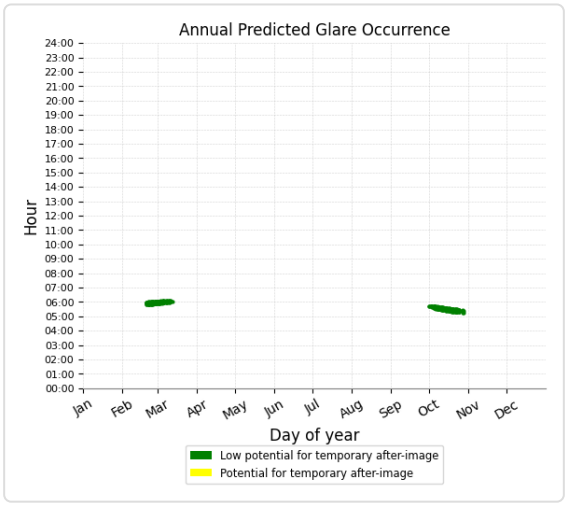


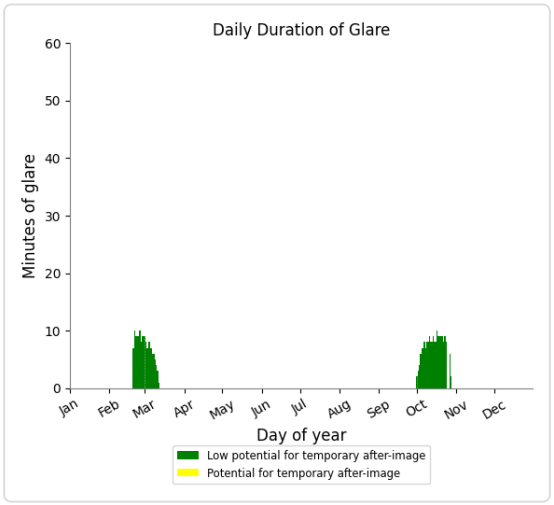


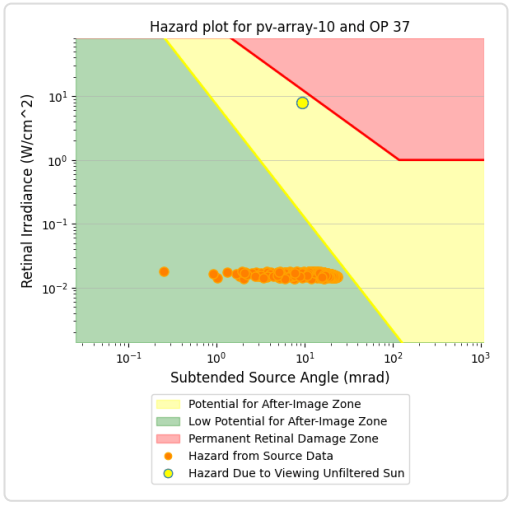
PV array 10 and OP 37

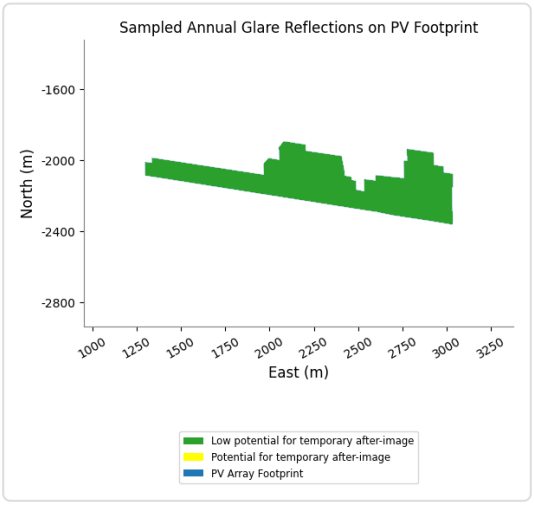
Yellow glare: none

Green glare: 341 min.





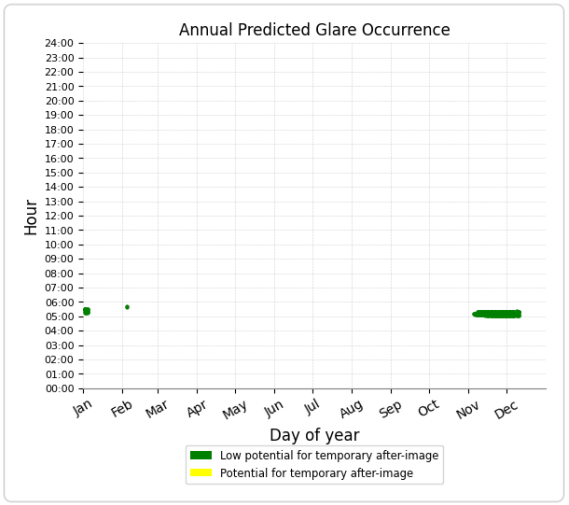


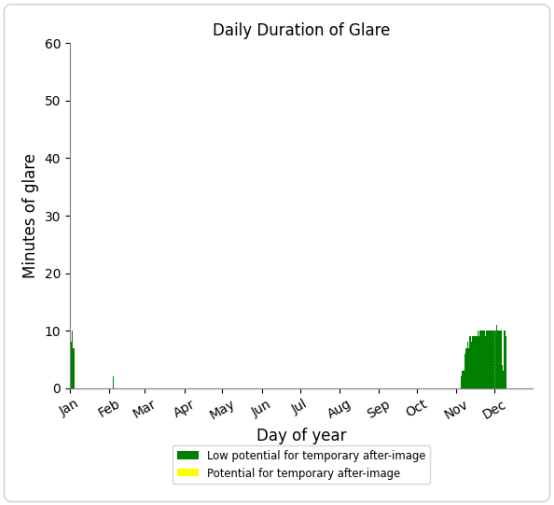


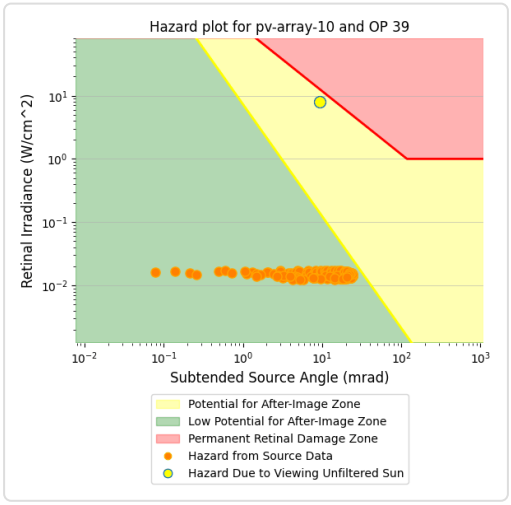
PV array 10 and OP 39

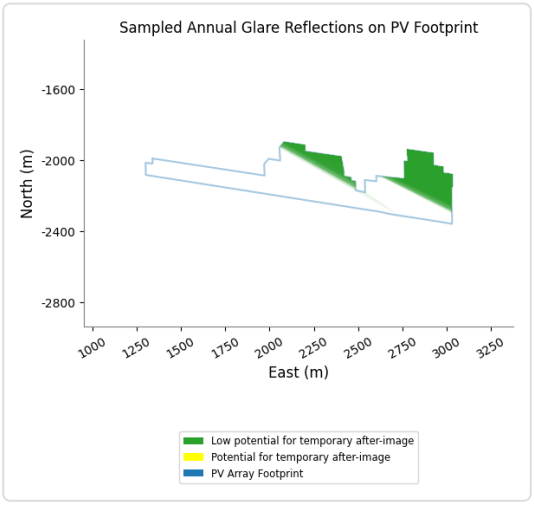
Yellow glare: none

Green glare: 331 min.





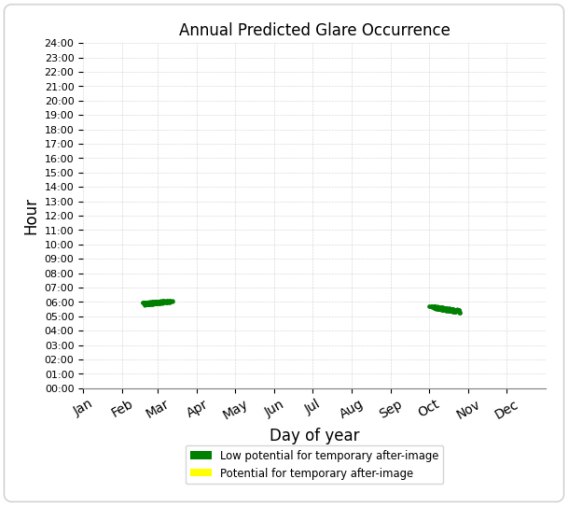


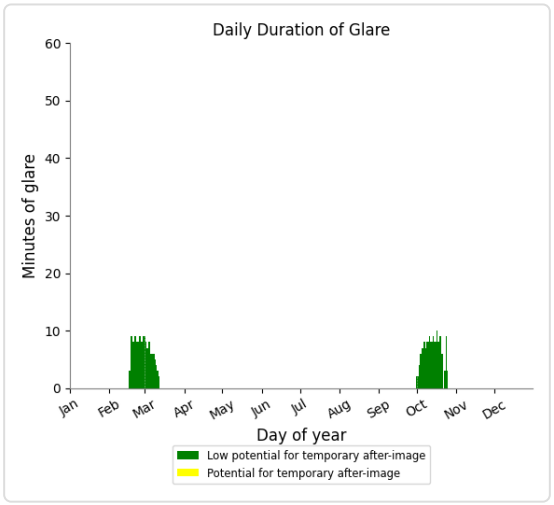


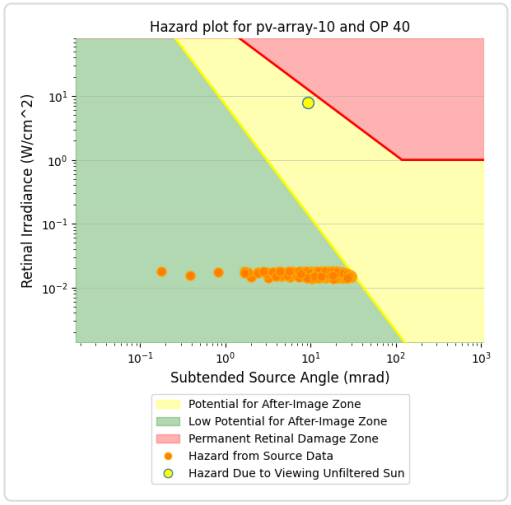
PV array 10 and OP 40

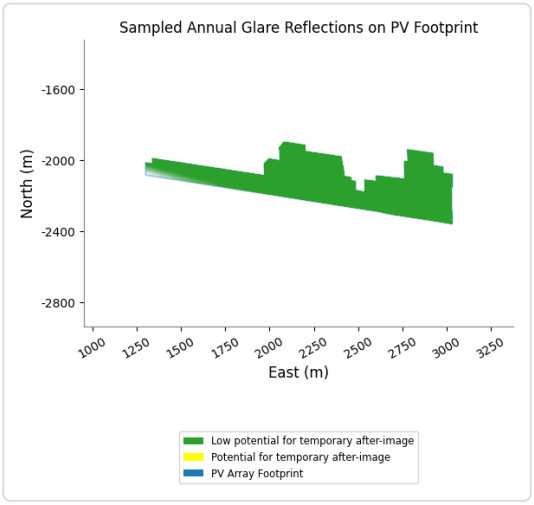
Yellow glare: none

Green glare: 335 min.









PV array 10 and OP 1

No glare found

PV array 10 and OP 2

No glare found

PV array 10 and OP 3

No glare found

PV array 10 and OP 4

No glare found

PV array 10 and OP 9

No glare found

PV array 10 and OP 10

No glare found

PV array 10 and OP 11

No glare found

PV array 10 and OP 12

No glare found

PV array 10 and OP 13

No glare found

PV array 10 and OP 14

No glare found

PV array 10 and OP 15

No glare found

PV array 10 and OP 16

No glare found

PV array 10 and OP 17

No glare found

PV array 10 and OP 18

No glare found

PV array 10 and OP 19

No glare found

PV array 10 and OP 20

No glare found

PV array 10 and OP 21

No glare found

PV array 10 and OP 32

No glare found

PV array 10 and OP 33

No glare found

PV array 10 and OP 34

No glare found

PV array 10 and OP 35

No glare found

PV array 10 and OP 36

No glare found

PV array 10 and OP 38

No glare found

PV: PV array 11 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 11 and Route: Kooringaroo Road

No glare found

PV array 11 and Route: Windellama Road

No glare found

PV array 11 and FP: FP 1

No glare found

PV array 11 and FP: FP 2

No glare found

PV array 11 and OP 1

No glare found

PV array 11 and OP 2

No glare found

PV array 11 and OP 3

No glare found

PV array 11 and OP 4

No glare found

PV array 11 and OP 5

No glare found

PV array 11 and OP 6

No glare found

PV array 11 and OP 7

No glare found

PV array 11 and OP 8

No glare found

PV array 11 and OP 9

No glare found

PV array 11 and OP 10

No glare found

PV array 11 and OP 11

No glare found

PV array 11 and OP 12

No glare found

PV array 11 and OP 13

No glare found

PV array 11 and OP 14

No glare found

PV array 11 and OP 15

No glare found

PV array 11 and OP 16

No glare found

PV array 11 and OP 17

No glare found

PV array 11 and OP 18

No glare found

PV array 11 and OP 19

No glare found

PV array 11 and OP 20

No glare found

PV array 11 and OP 21

No glare found

PV array 11 and OP 22

No glare found

PV array 11 and OP 23

No glare found

PV array 11 and OP 24

No glare found

PV array 11 and OP 25

No glare found

PV array 11 and OP 26

No glare found

PV array 11 and OP 27

No glare found

PV array 11 and OP 28

No glare found

PV array 11 and OP 29

No glare found

PV array 11 and OP 30

No glare found

PV array 11 and OP 31

No glare found

PV array 11 and OP 32

No glare found

PV array 11 and OP 33

No glare found

PV array 11 and OP 34

No glare found

PV array 11 and OP 35

No glare found

PV array 11 and OP 36

No glare found

PV array 11 and OP 37

No glare found

PV array 11 and OP 38

No glare found

PV array 11 and OP 39

No glare found

PV array 11 and OP 40

No glare found

PV: PV array 12 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 12 and Route: Kooringaroo Road

No glare found

PV array 12 and Route: Windellama Road

No glare found

PV array 12 and FP: FP 1

No glare found

PV array 12 and FP: FP 2

No glare found

PV array 12 and OP 1

No glare found

PV array 12 and OP 2

No glare found

PV array 12 and OP 3

No glare found

PV array 12 and OP 4

No glare found

PV array 12 and OP 5

No glare found

PV array 12 and OP 6

No glare found

PV array 12 and OP 7

No glare found

PV array 12 and OP 8

No glare found

PV array 12 and OP 9

No glare found

PV array 12 and OP 10

No glare found

PV array 12 and OP 11

No glare found

PV array 12 and OP 12

No glare found

PV array 12 and OP 13

No glare found

PV array 12 and OP 14

No glare found

PV array 12 and OP 15

No glare found

PV array 12 and OP 16

No glare found

PV array 12 and OP 17

No glare found

PV array 12 and OP 18

No glare found

PV array 12 and OP 19

No glare found

PV array 12 and OP 20

No glare found

PV array 12 and OP 21

No glare found

PV array 12 and OP 22

No glare found

PV array 12 and OP 23

No glare found

PV array 12 and OP 24

No glare found

PV array 12 and OP 25

No glare found

PV array 12 and OP 26

No glare found

PV array 12 and OP 27

No glare found

PV array 12 and OP 28

No glare found

PV array 12 and OP 29

No glare found

PV array 12 and OP 30

No glare found

PV array 12 and OP 31

No glare found

PV array 12 and OP 32

No glare found

PV array 12 and OP 33

No glare found

PV array 12 and OP 34

No glare found

PV array 12 and OP 35

No glare found

PV array 12 and OP 36

No glare found

PV array 12 and OP 37

No glare found

PV array 12 and OP 38

No glare found

PV array 12 and OP 39

No glare found

PV array 12 and OP 40

No glare found

PV: PV array 13 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 13 and Route: Kooringaroo Road

No glare found

PV array 13 and Route: Windellama Road

No glare found

PV array 13 and FP: FP 1

No glare found

PV array 13 and FP: FP 2

No glare found

PV array 13 and OP 1

No glare found

PV array 13 and OP 2

No glare found

PV array 13 and OP 3

No glare found

PV array 13 and OP 4

No glare found

PV array 13 and OP 5

No glare found

PV array 13 and OP 6

No glare found

PV array 13 and OP 7

No glare found

PV array 13 and OP 8

No glare found

PV array 13 and OP 9

No glare found

PV array 13 and OP 10

No glare found

PV array 13 and OP 11

No glare found

PV array 13 and OP 12

No glare found

PV array 13 and OP 13

No glare found

PV array 13 and OP 14

No glare found

PV array 13 and OP 15

No glare found

PV array 13 and OP 16

No glare found

PV array 13 and OP 17

No glare found

PV array 13 and OP 18

No glare found

PV array 13 and OP 19

No glare found

PV array 13 and OP 20

No glare found

PV array 13 and OP 21

No glare found

PV array 13 and OP 22

No glare found

PV array 13 and OP 23

No glare found

PV array 13 and OP 24

No glare found

PV array 13 and OP 25

No glare found

PV array 13 and OP 26

No glare found

PV array 13 and OP 27

No glare found

PV array 13 and OP 28

No glare found

PV array 13 and OP 29

No glare found

PV array 13 and OP 30

No glare found

PV array 13 and OP 31

No glare found

PV array 13 and OP 32

No glare found

PV array 13 and OP 33

No glare found

PV array 13 and OP 34

No glare found

PV array 13 and OP 35

No glare found

PV array 13 and OP 36

No glare found

PV array 13 and OP 37

No glare found

PV array 13 and OP 38

No glare found

PV array 13 and OP 39

No glare found

PV array 13 and OP 40

No glare found

PV: PV array 14 low potential for temporary after-image

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 2	618	10.3	0	0.0
OP 34	105	1.8	0	0.0
OP 1	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 14 and Route: Kooringaroo Road

No glare found

PV array 14 and Route: Windellama Road

No glare found

PV array 14 and FP: FP 1

No glare found

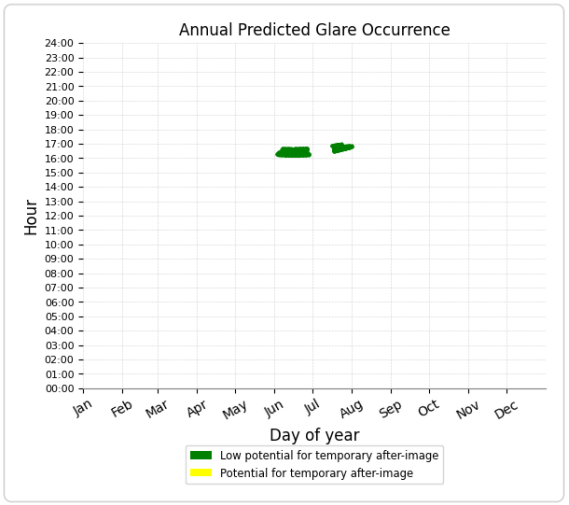
PV array 14 and FP: FP 2

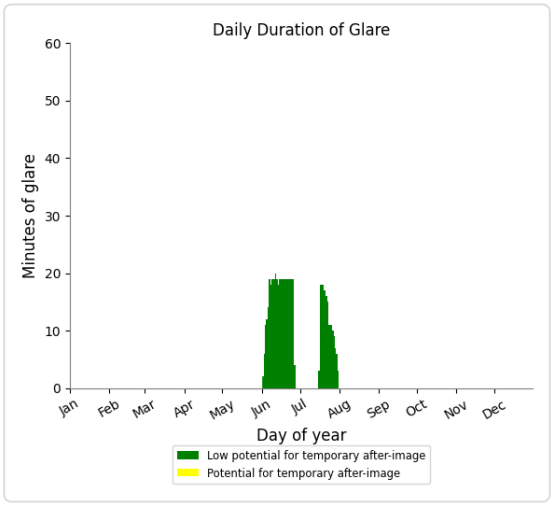
No glare found

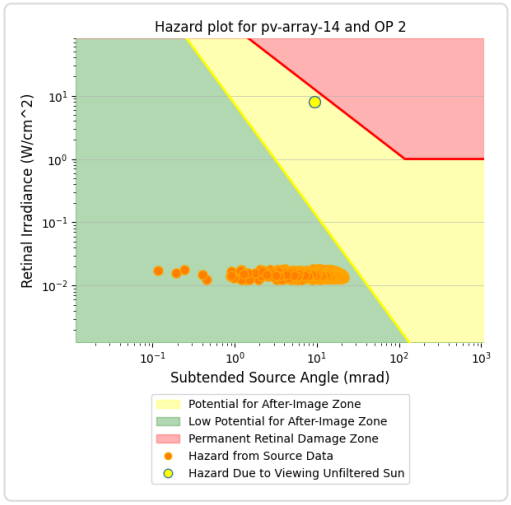
PV array 14 and OP 2

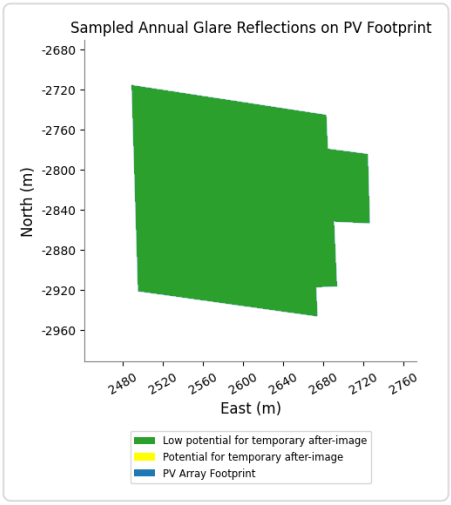
Yellow glare: none

Green glare: 618 min.





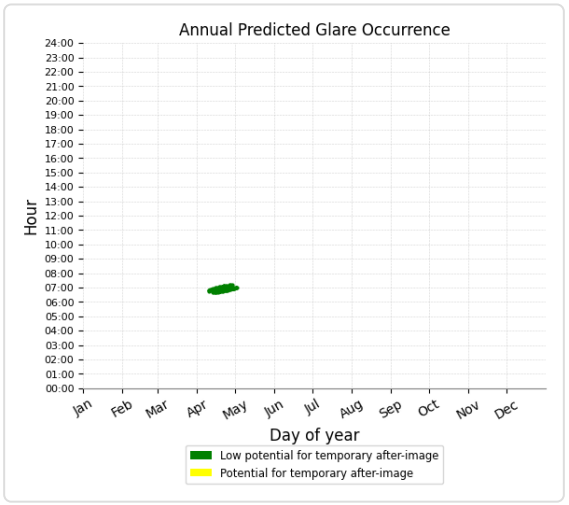


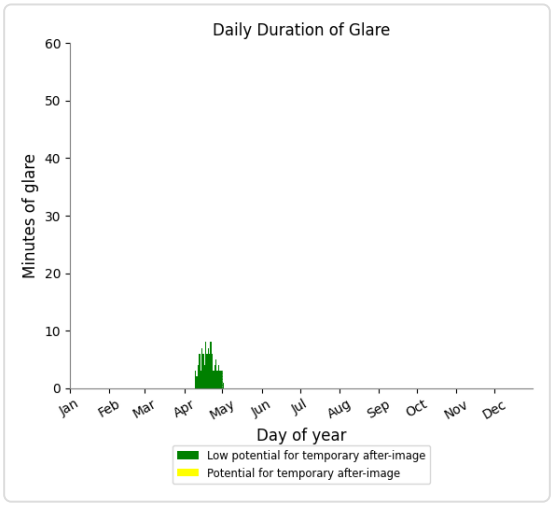


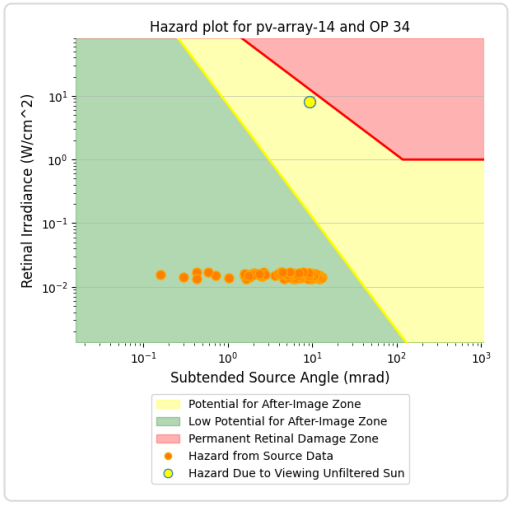
PV array 14 and OP 34

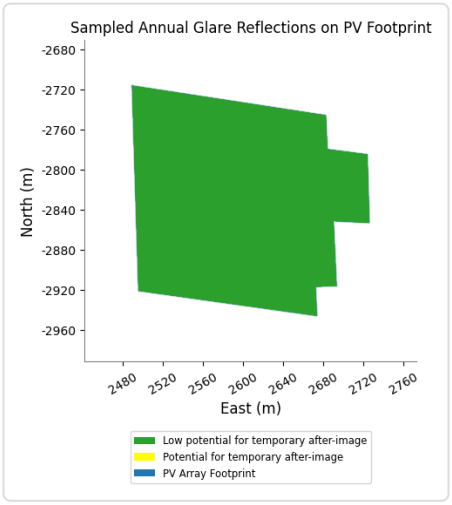
Yellow glare: none

Green glare: 105 min.









PV array 14 and OP 1

No glare found

PV array 14 and OP 3

No glare found

PV array 14 and OP 4

No glare found

PV array 14 and OP 5

No glare found

PV array 14 and OP 6

No glare found

PV array 14 and OP 7

No glare found

PV array 14 and OP 8

No glare found

PV array 14 and OP 9

No glare found

PV array 14 and OP 10

No glare found

PV array 14 and OP 11

No glare found

PV array 14 and OP 12

No glare found

PV array 14 and OP 13

No glare found

PV array 14 and OP 14

No glare found

PV array 14 and OP 15

No glare found

PV array 14 and OP 16

No glare found

PV array 14 and OP 17

No glare found

PV array 14 and OP 18

No glare found

PV array 14 and OP 19

No glare found

PV array 14 and OP 20

No glare found

PV array 14 and OP 21

No glare found

PV array 14 and OP 22

No glare found

PV array 14 and OP 23

No glare found

PV array 14 and OP 24

No glare found

PV array 14 and OP 25

No glare found

PV array 14 and OP 26

No glare found

PV array 14 and OP 27

No glare found

PV array 14 and OP 28

No glare found

PV array 14 and OP 29

No glare found

PV array 14 and OP 30

No glare found

PV array 14 and OP 31

No glare found

PV array 14 and OP 32

No glare found

PV array 14 and OP 33

No glare found

PV array 14 and OP 35

No glare found

PV array 14 and OP 36

No glare found

PV array 14 and OP 37

No glare found

PV array 14 and OP 38

No glare found

PV array 14 and OP 39

No glare found

PV array 14 and OP 40

No glare found

PV: PV array 2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 2 and Route: Kooringaroo Road

No glare found

PV array 2 and Route: Windellama Road

No glare found

PV array 2 and FP: FP 1

No glare found

PV array 2 and FP: FP 2

No glare found

PV array 2 and OP 1

No glare found

PV array 2 and OP 2

No glare found

PV array 2 and OP 3

No glare found

PV array 2 and OP 4

No glare found

PV array 2 and OP 5

No glare found

PV array 2 and OP 6

No glare found

PV array 2 and OP 7

No glare found

PV array 2 and OP 8

No glare found

PV array 2 and OP 9

No glare found

PV array 2 and OP 10

No glare found

PV array 2 and OP 11

No glare found

PV array 2 and OP 12

No glare found

PV array 2 and OP 13

No glare found

PV array 2 and OP 14

No glare found

PV array 2 and OP 15

No glare found

PV array 2 and OP 16

No glare found

PV array 2 and OP 17

No glare found

PV array 2 and OP 18

No glare found

PV array 2 and OP 19

No glare found

PV array 2 and OP 20

No glare found

PV array 2 and OP 21

No glare found

PV array 2 and OP 22

No glare found

PV array 2 and OP 23

No glare found

PV array 2 and OP 24

No glare found

PV array 2 and OP 25

No glare found

PV array 2 and OP 26

No glare found

PV array 2 and OP 27

No glare found

PV array 2 and OP 28

No glare found

PV array 2 and OP 29

No glare found

PV array 2 and OP 30

No glare found

PV array 2 and OP 31

No glare found

PV array 2 and OP 32

No glare found

PV array 2 and OP 33

No glare found

PV array 2 and OP 34

No glare found

PV array 2 and OP 35

No glare found

PV array 2 and OP 36

No glare found

PV array 2 and OP 37

No glare found

PV array 2 and OP 38

No glare found

PV array 2 and OP 39

No glare found

PV array 2 and OP 40

No glare found

PV: PV array 3 low potential for temporary after-image

Receptor results ordered by category of glare

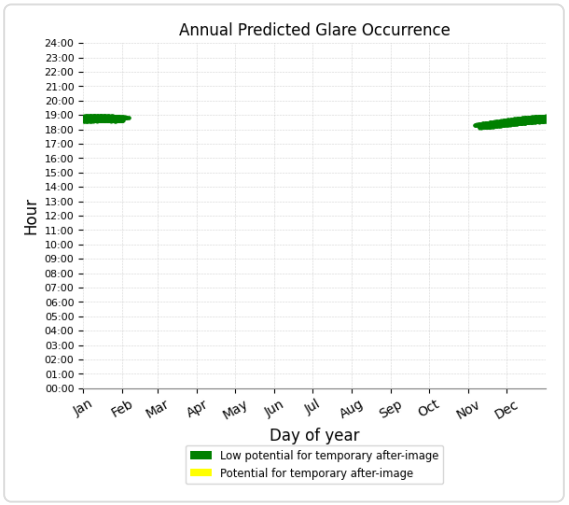
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	885	14.8	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 3	134	2.2	0	0.0
OP 5	179	3.0	0	0.0
OP 6	222	3.7	0	0.0
OP 22	243	4.0	0	0.0
OP 23	76	1.3	0	0.0
OP 24	255	4.2	0	0.0
OP 25	205	3.4	0	0.0
OP 26	275	4.6	0	0.0
OP 27	148	2.5	0	0.0
OP 28	31	0.5	0	0.0
OP 39	316	5.3	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0

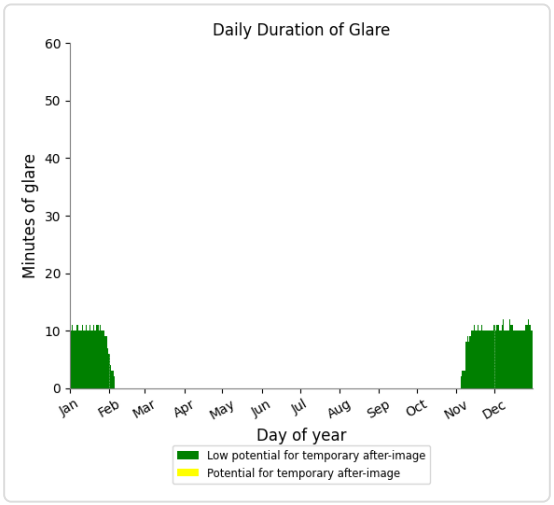
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

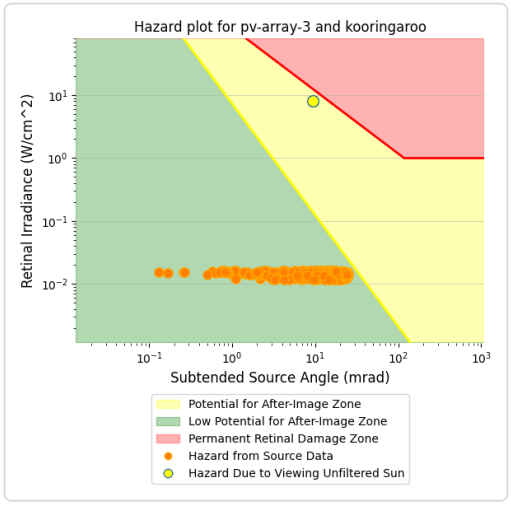
PV array 3 and Route: Kooringaroo Road

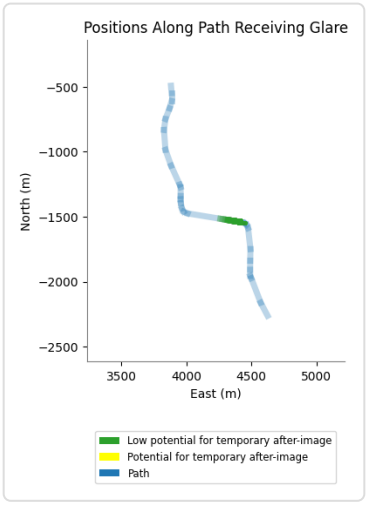
Yellow glare: none

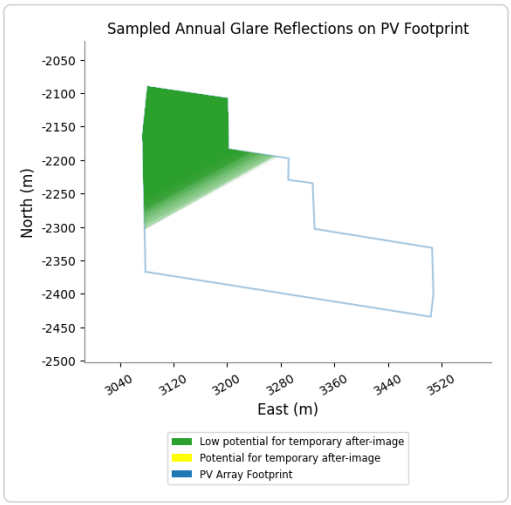
Green glare: 885 min.











PV array 3 and Route: Windellama Road

No glare found

PV array 3 and FP: FP 1

No glare found

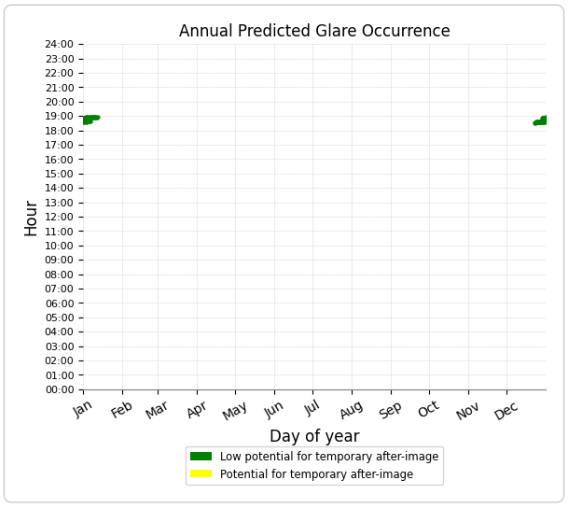
PV array 3 and FP: FP 2

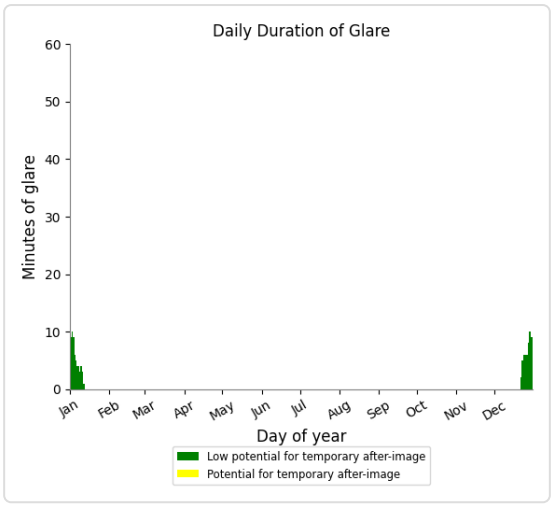
No glare found

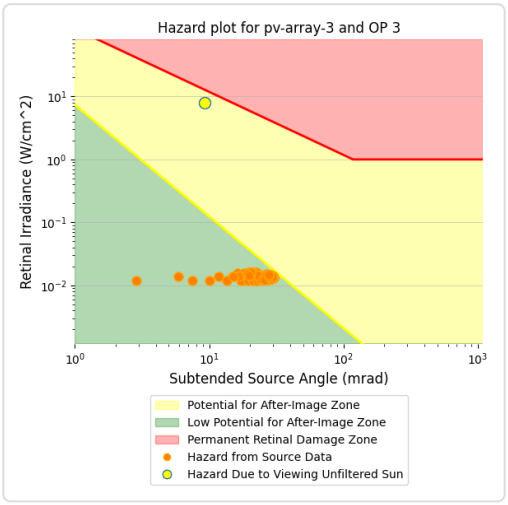
PV array 3 and OP 3

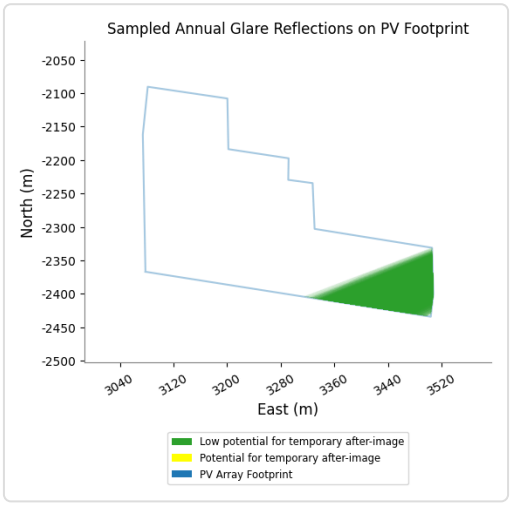
Yellow glare: none

Green glare: 134 min.





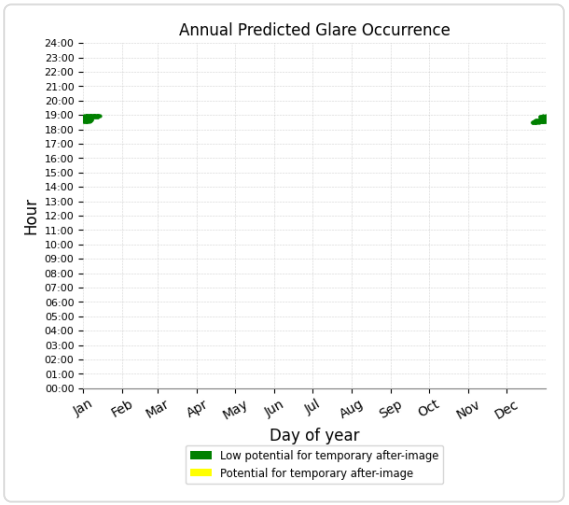


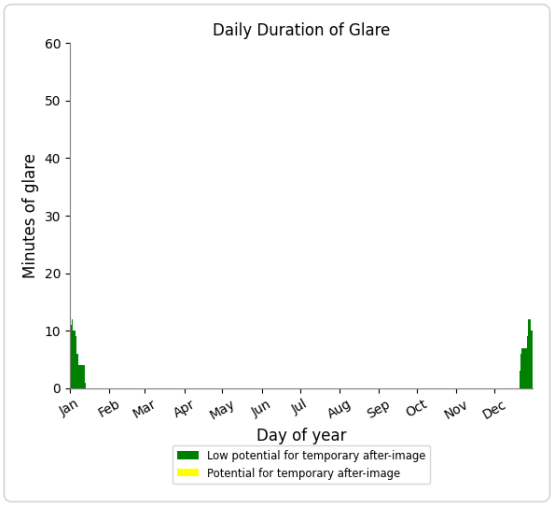


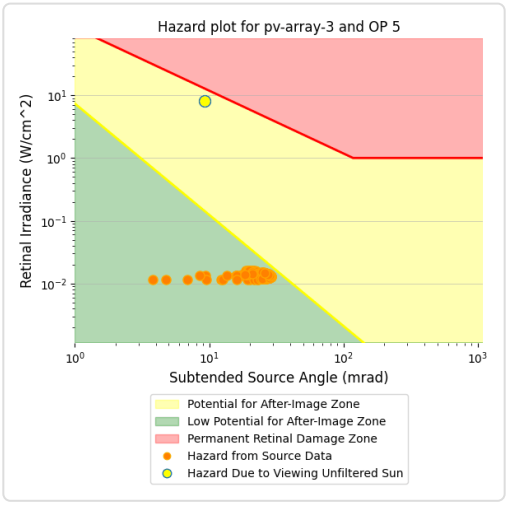
PV array 3 and OP 5

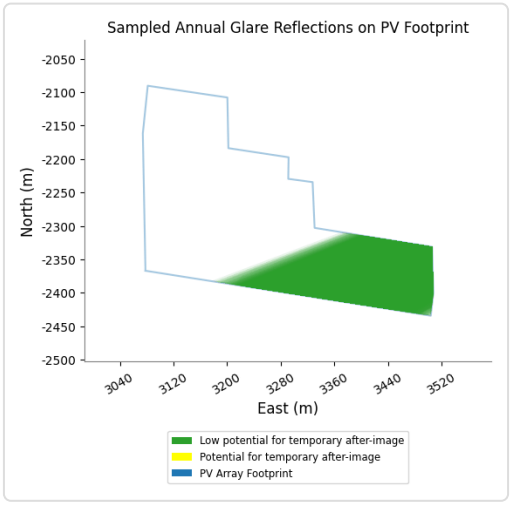
Yellow glare: none

Green glare: 179 min.





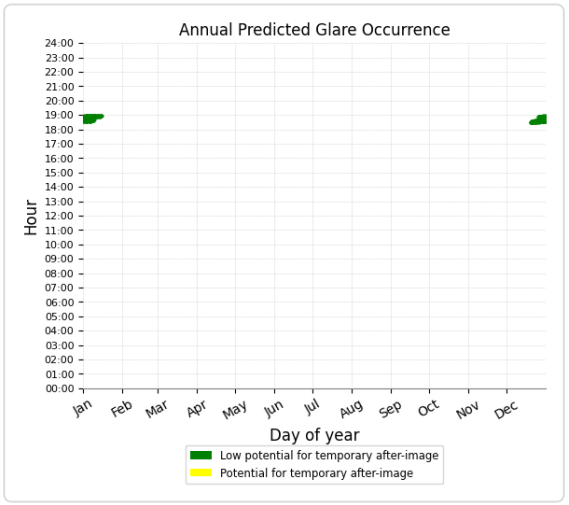


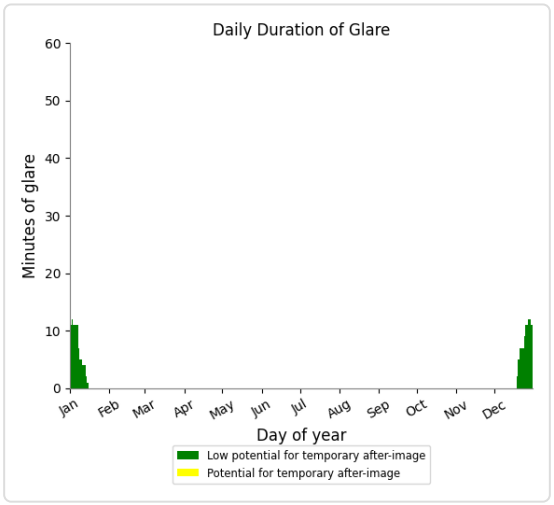


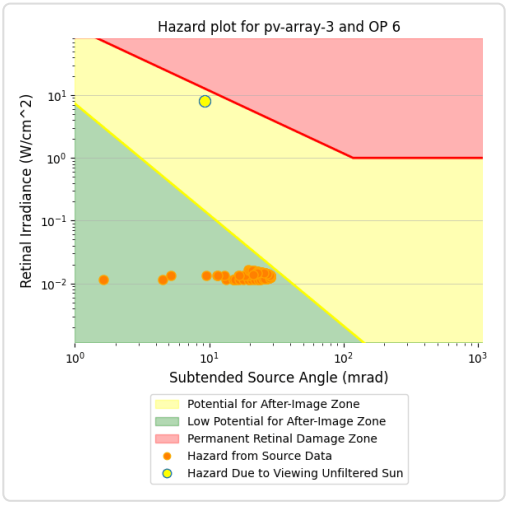
PV array 3 and OP 6

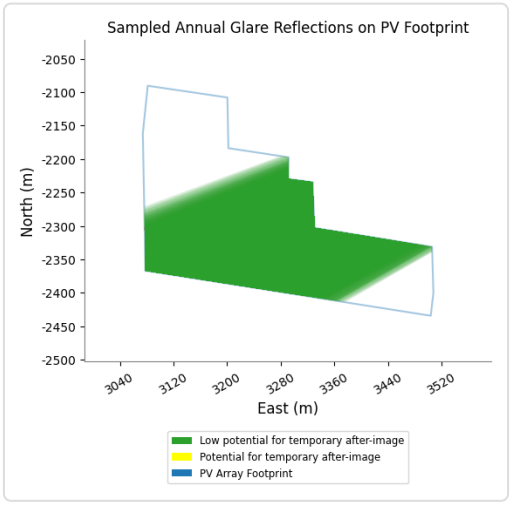
Yellow glare: none

Green glare: 222 min.





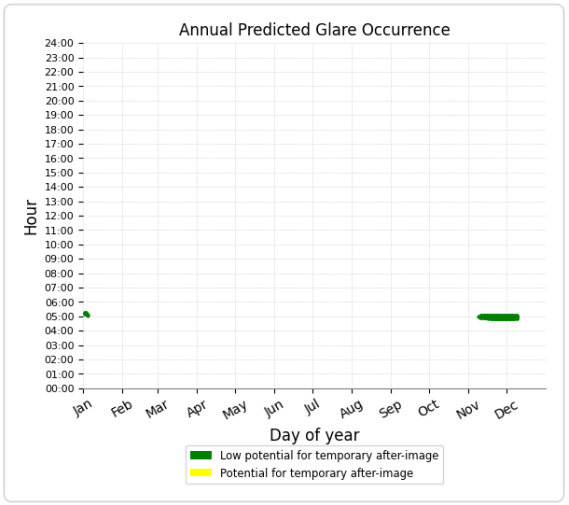


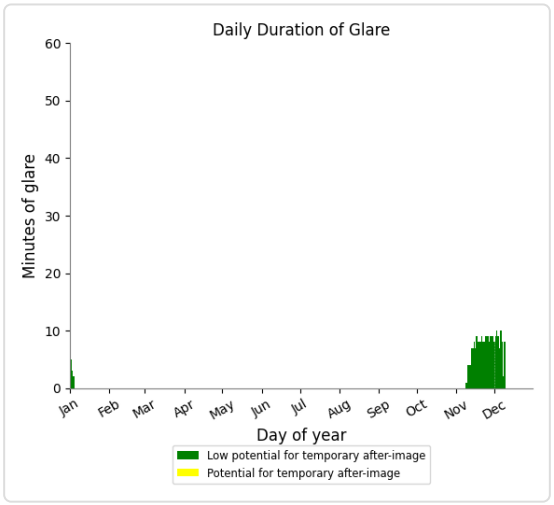


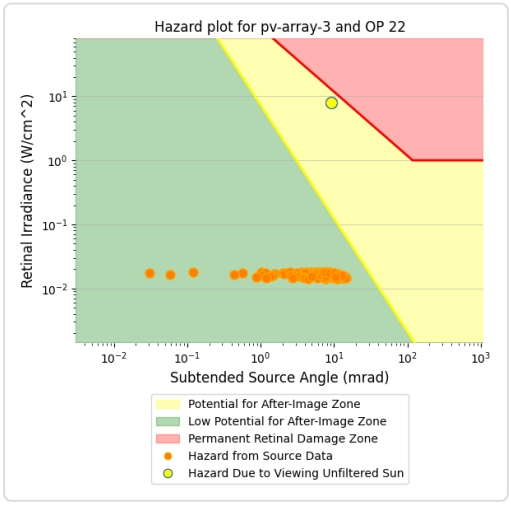
PV array 3 and OP 22

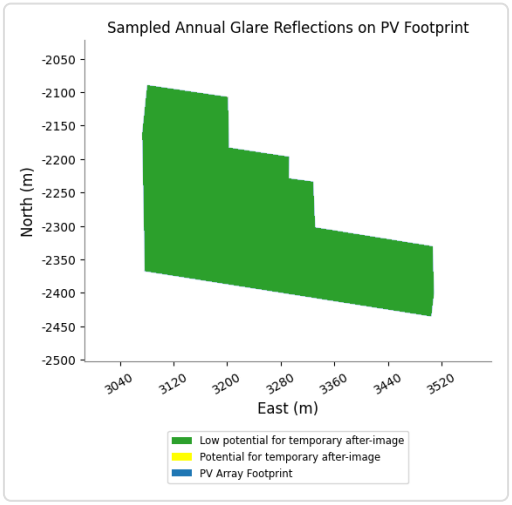
Yellow glare: none

Green glare: 243 min.





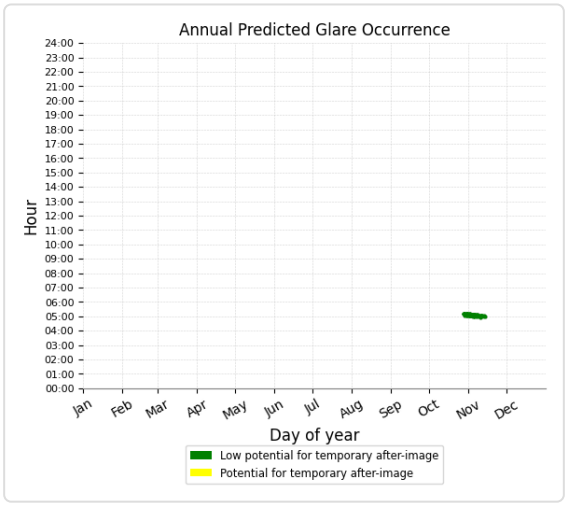


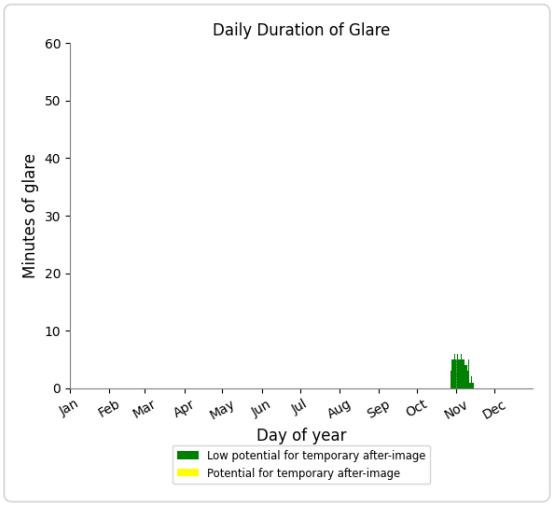


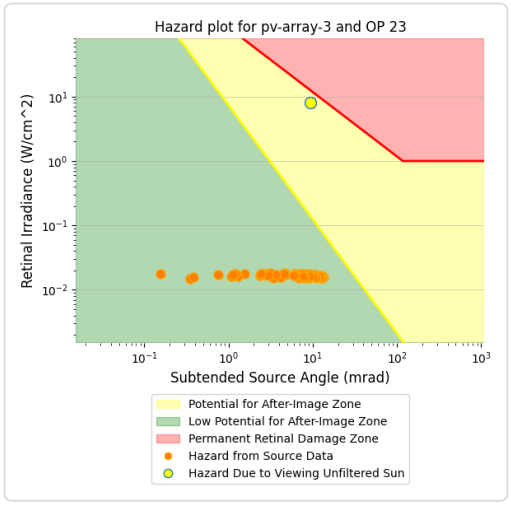
PV array 3 and OP 23

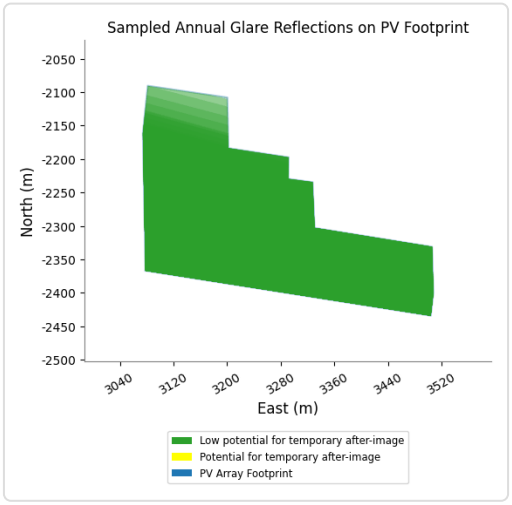
Yellow glare: none

Green glare: 76 min.





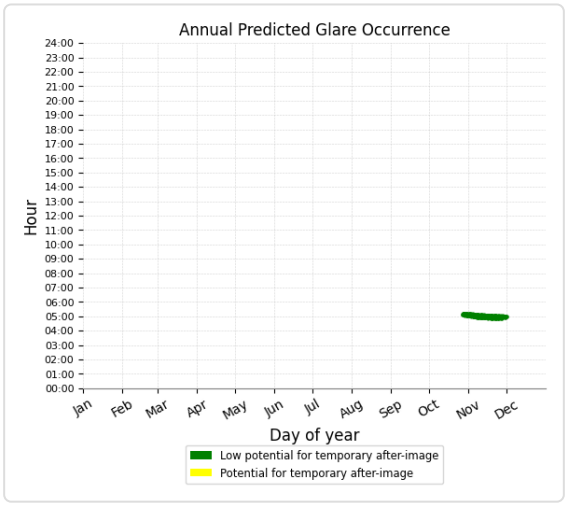


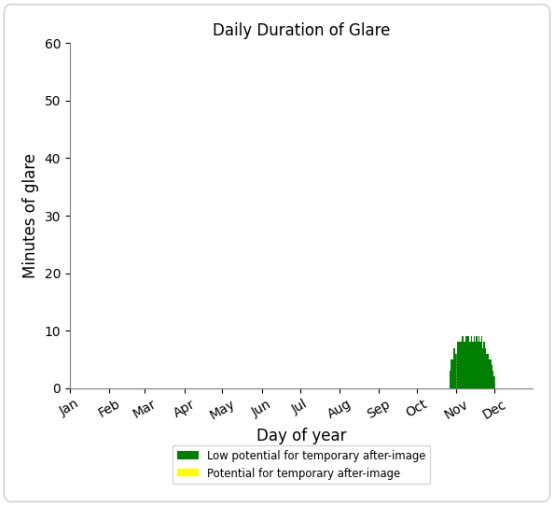


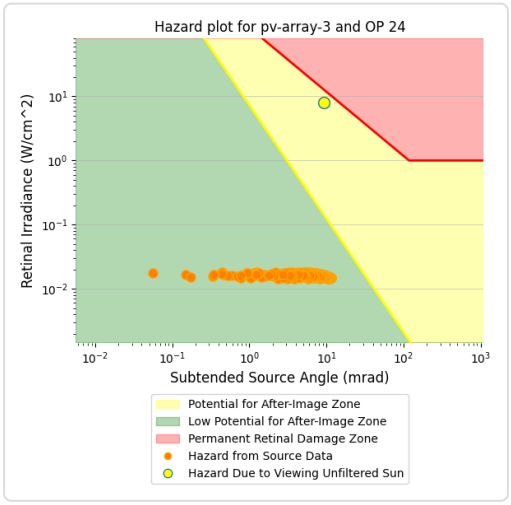
PV array 3 and OP 24

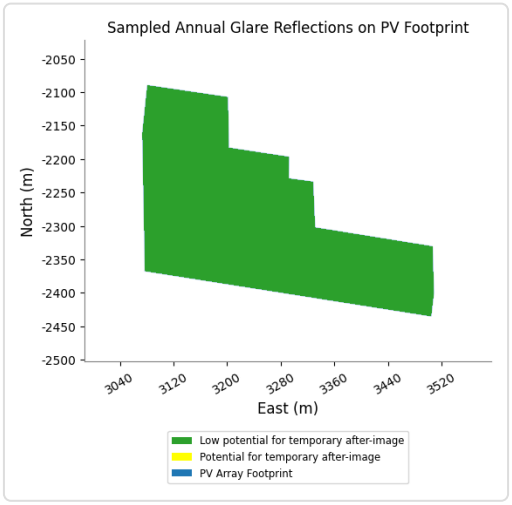
Yellow glare: none

Green glare: 255 min.





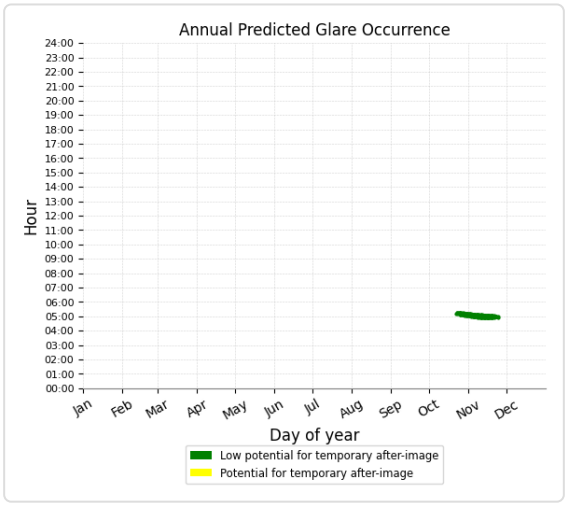


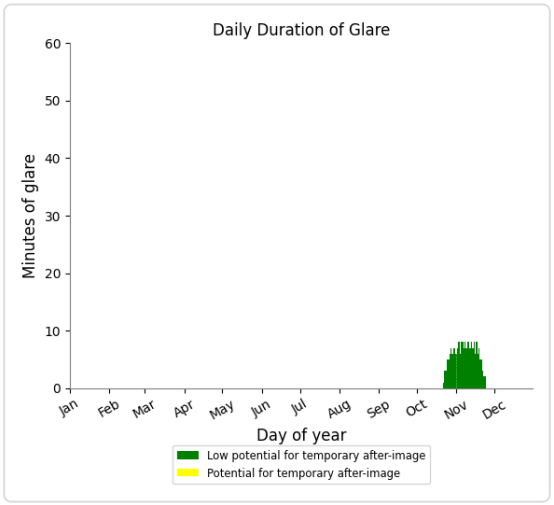


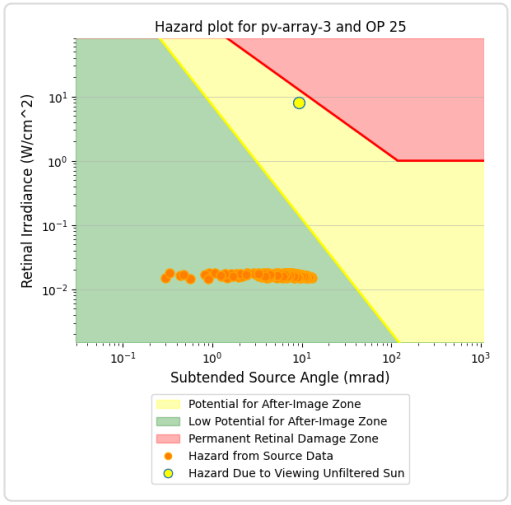
PV array 3 and OP 25

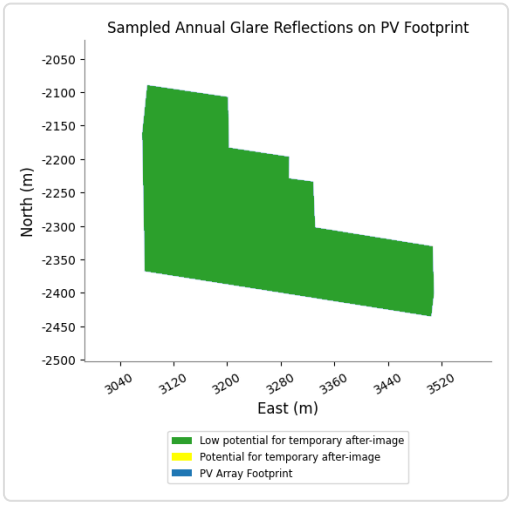
Yellow glare: none

Green glare: 205 min.





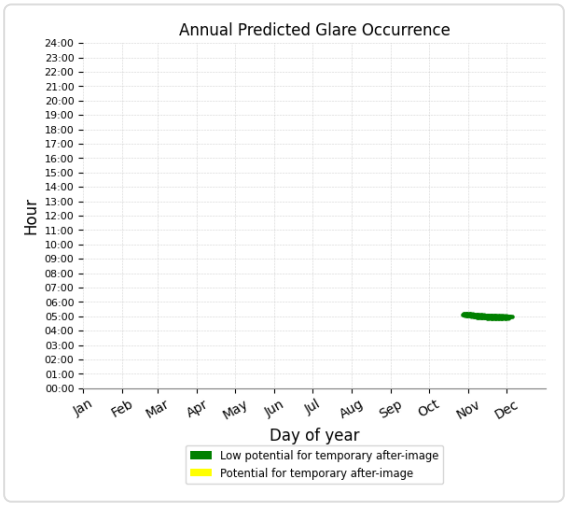


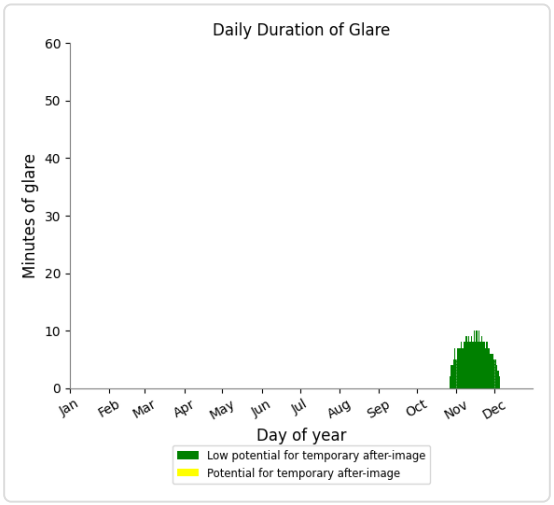


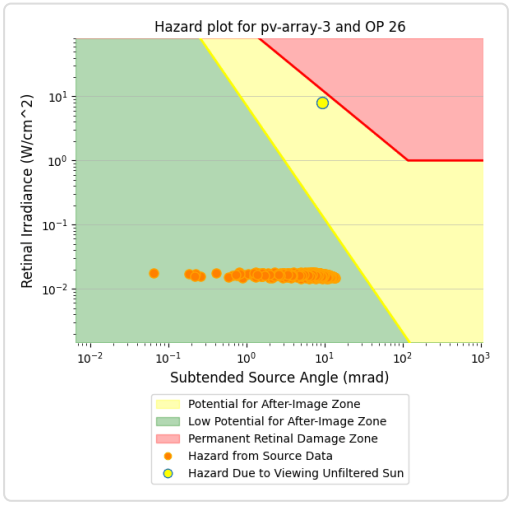
PV array 3 and OP 26

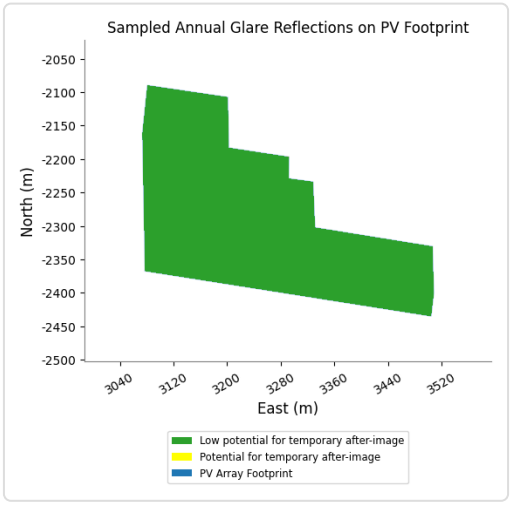
Yellow glare: none

Green glare: 275 min.





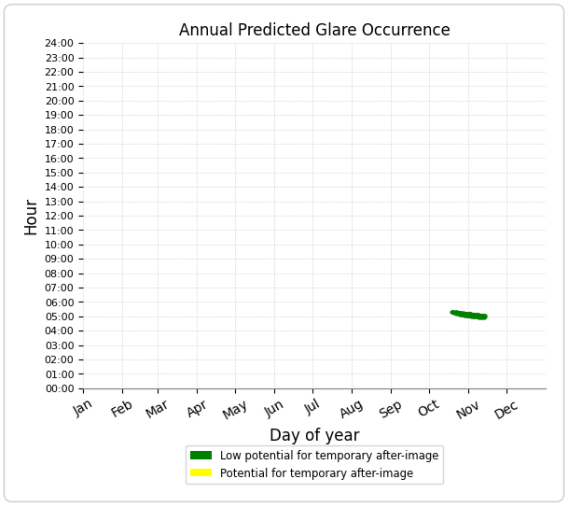


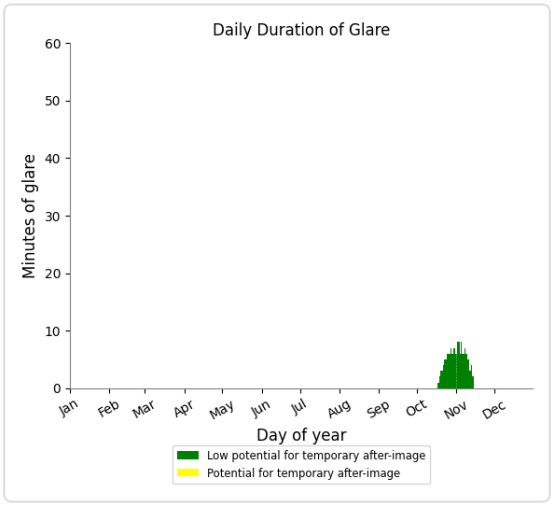


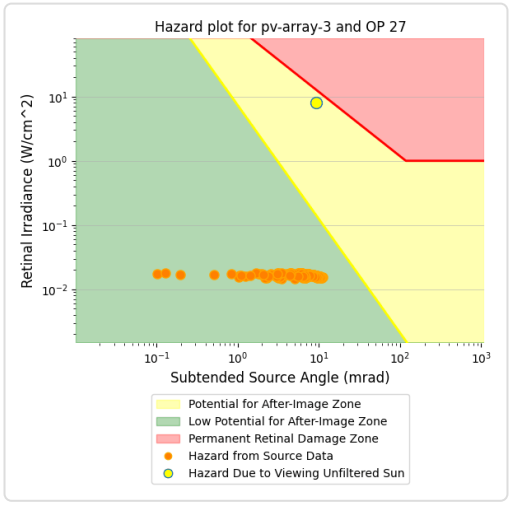
PV array 3 and OP 27

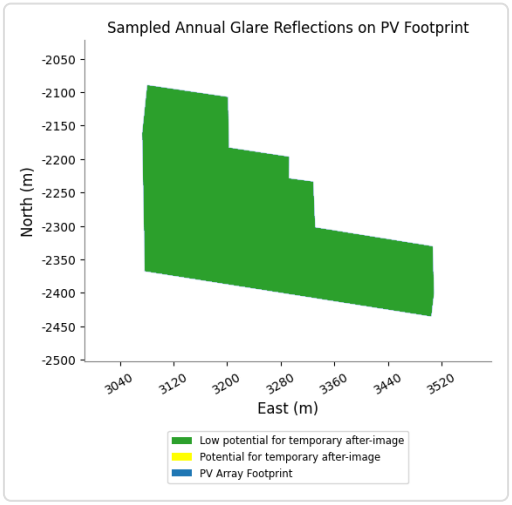
Yellow glare: none

Green glare: 148 min.





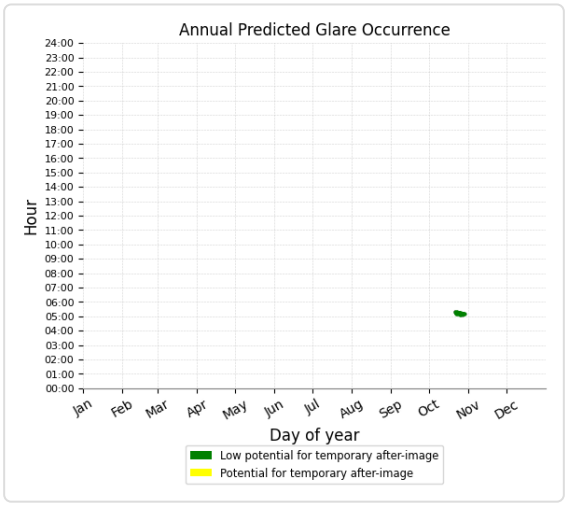


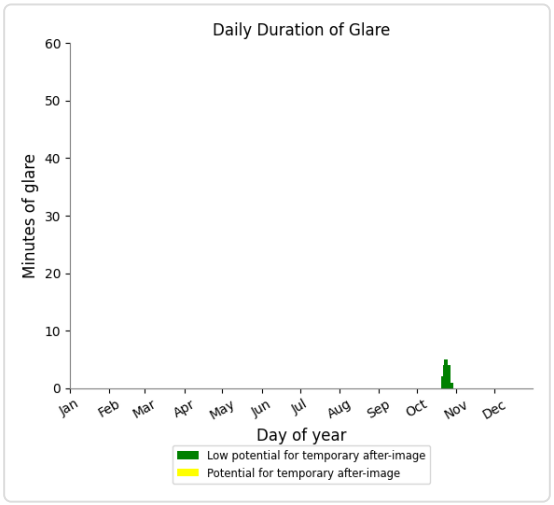


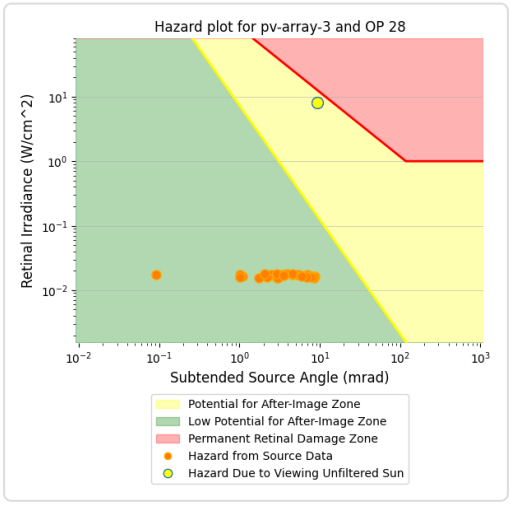
PV array 3 and OP 28

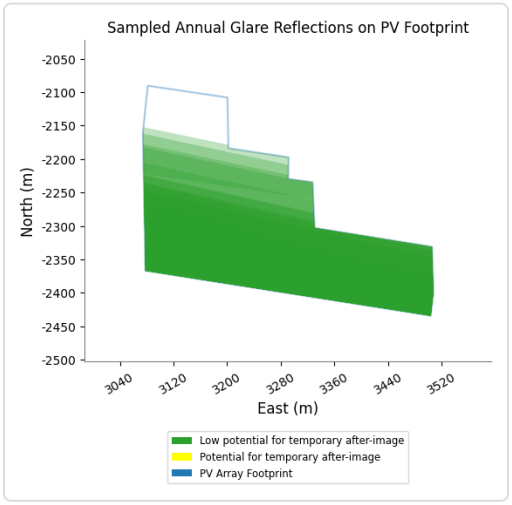
Yellow glare: none

Green glare: 31 min.





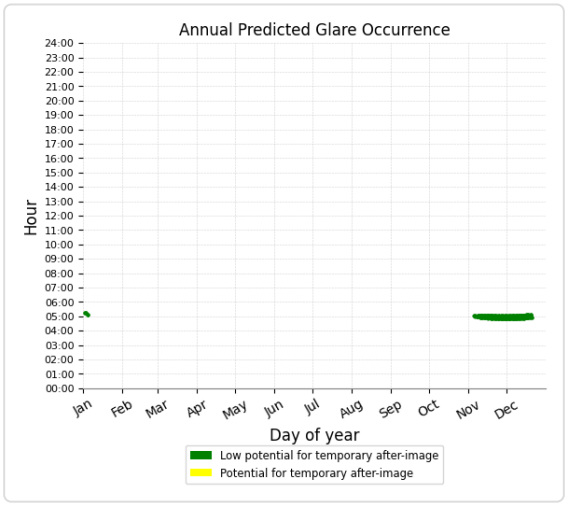


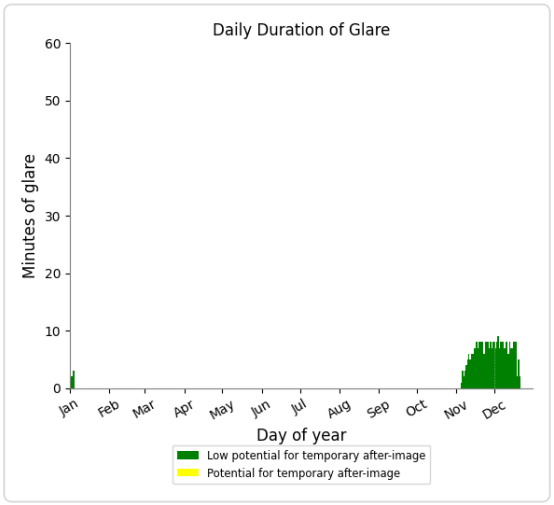


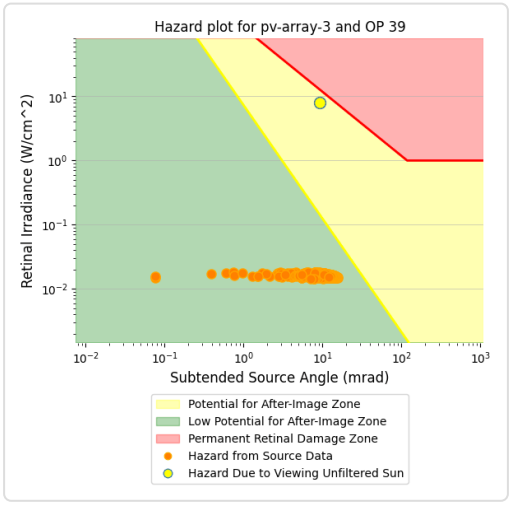
PV array 3 and OP 39

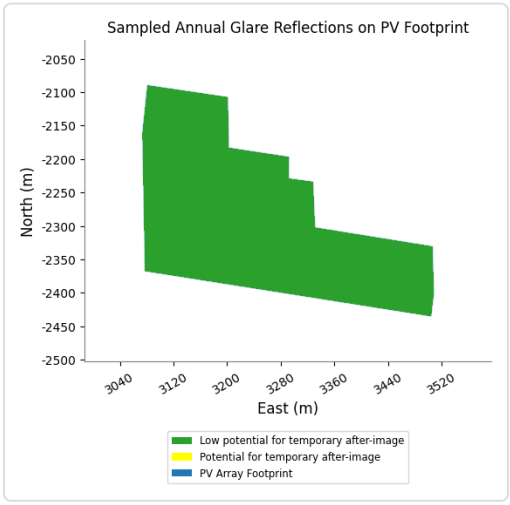
Yellow glare: none

Green glare: 316 min.









PV array 3 and OP 1

No glare found

PV array 3 and OP 2

No glare found

PV array 3 and OP 4

No glare found

PV array 3 and OP 7

No glare found

PV array 3 and OP 8

No glare found

PV array 3 and OP 9

No glare found

PV array 3 and OP 10

No glare found

PV array 3 and OP 11

No glare found

PV array 3 and OP 12

No glare found

PV array 3 and OP 13

No glare found

PV array 3 and OP 14

No glare found

PV array 3 and OP 15

No glare found

PV array 3 and OP 16

No glare found

PV array 3 and OP 17

No glare found

PV array 3 and OP 18

No glare found

PV array 3 and OP 19

No glare found

PV array 3 and OP 20

No glare found

PV array 3 and OP 21

No glare found

PV array 3 and OP 29

No glare found

PV array 3 and OP 30

No glare found

PV array 3 and OP 31

No glare found

PV array 3 and OP 32

No glare found

PV array 3 and OP 33

No glare found

PV array 3 and OP 34

No glare found

PV array 3 and OP 35

No glare found

PV array 3 and OP 36

No glare found

PV array 3 and OP 37

No glare found

PV array 3 and OP 38

No glare found

PV array 3 and OP 40

No glare found

PV: PV array 4 low potential for temporary after-image

Receptor results ordered by category of glare

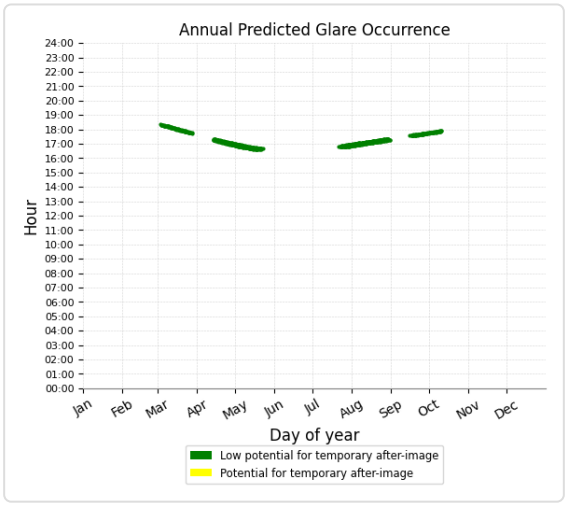
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	709	11.8	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 7	98	1.6	0	0.0
OP 8	362	6.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

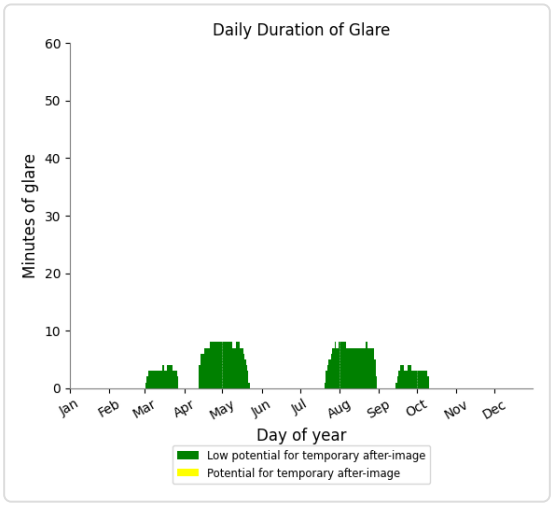
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

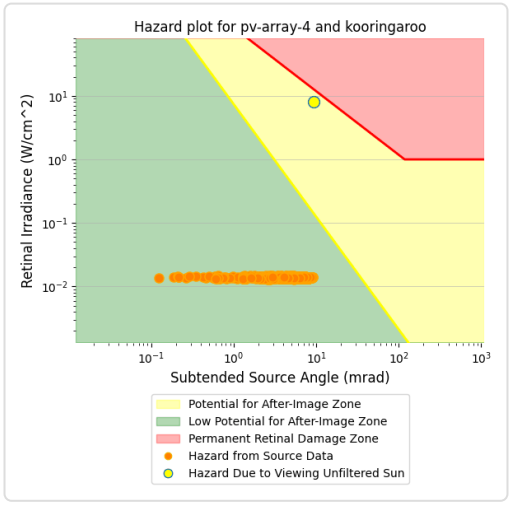
PV array 4 and Route: Kooringaroo Road

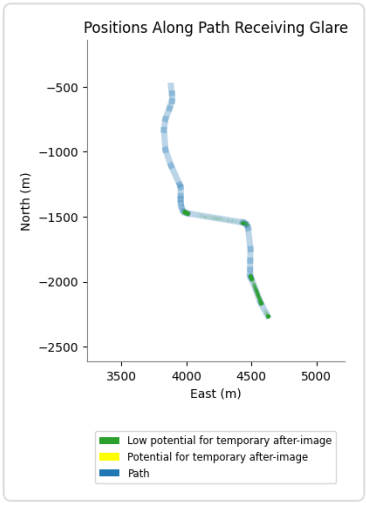
Yellow glare: none

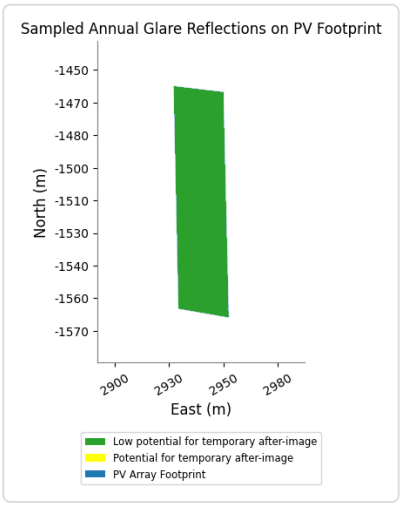
Green glare: 709 min.











PV array 4 and Route: Windellama Road

No glare found

PV array 4 and FP: FP 1

No glare found

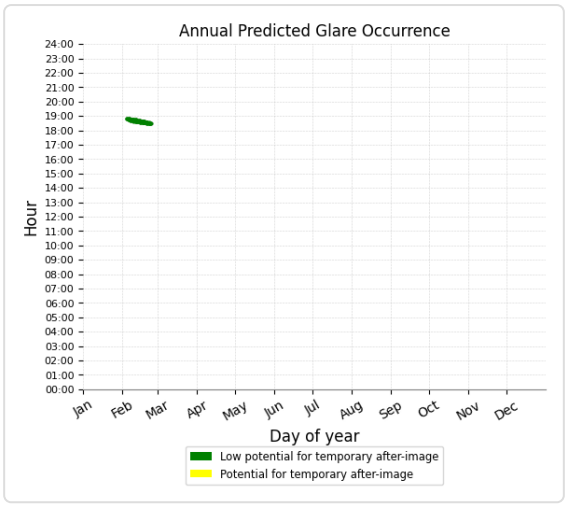
PV array 4 and FP: FP 2

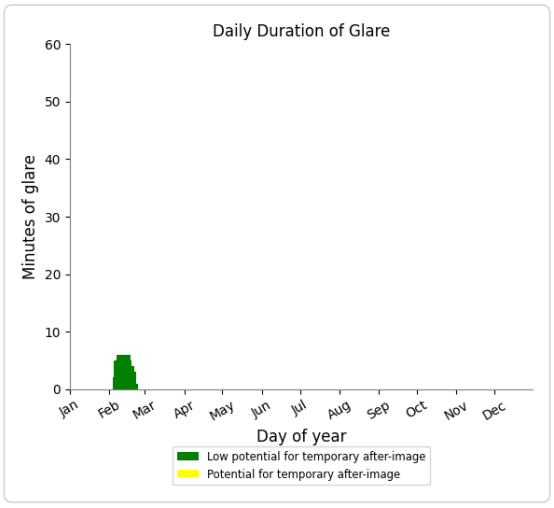
No glare found

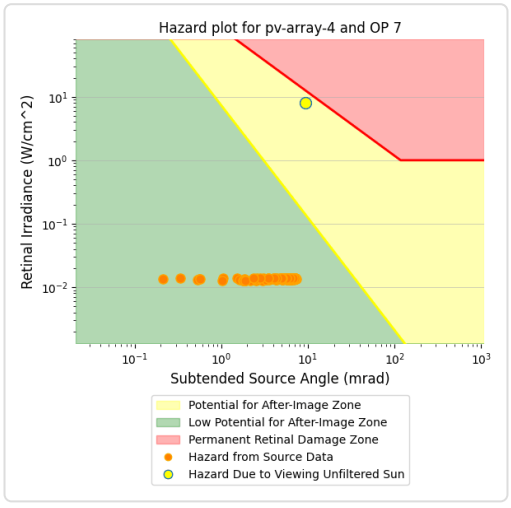
PV array 4 and OP 7

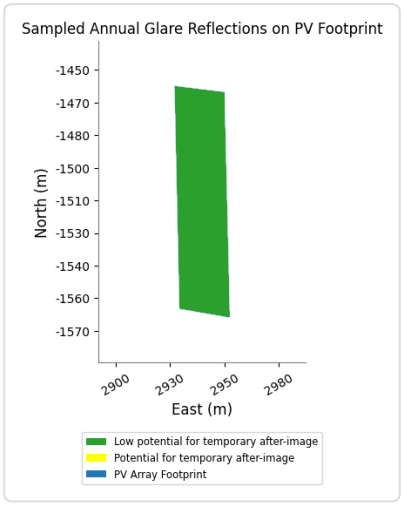
Yellow glare: none

Green glare: 98 min.





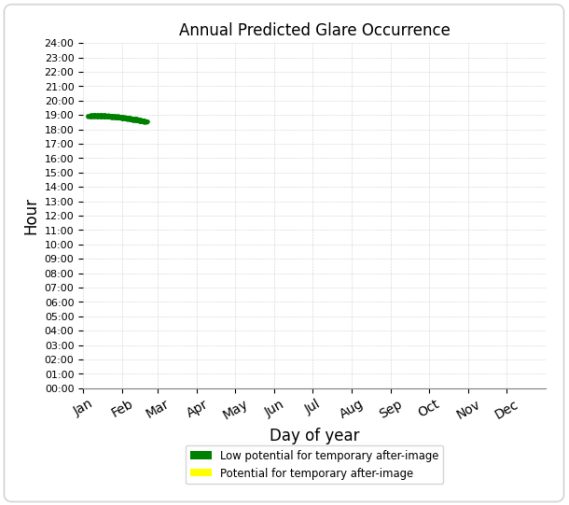


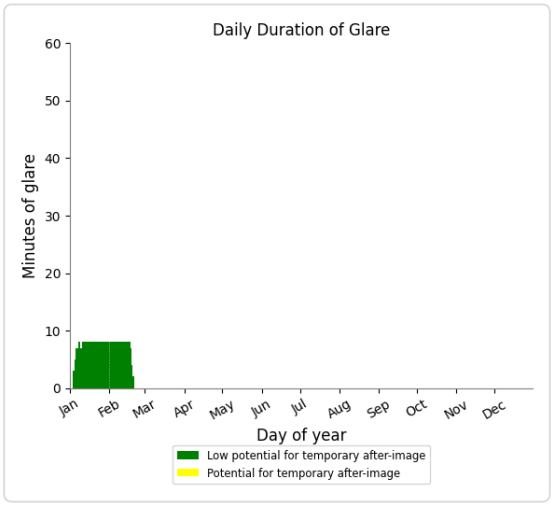


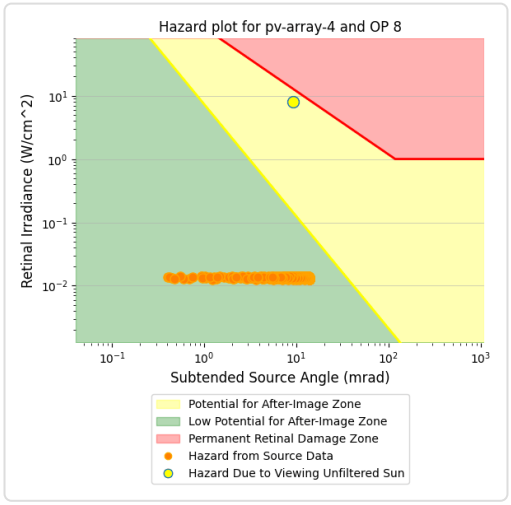
PV array 4 and OP 8

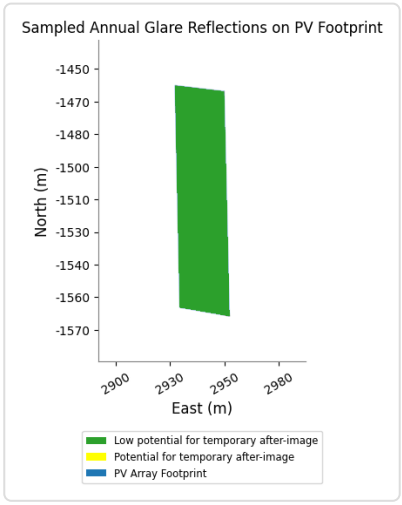
Yellow glare: none

Green glare: 362 min.









PV array 4 and OP 1

No glare found

PV array 4 and OP 2

No glare found

PV array 4 and OP 3

No glare found

PV array 4 and OP 4

No glare found

PV array 4 and OP 5

No glare found

PV array 4 and OP 6

No glare found

PV array 4 and OP 9

No glare found

PV array 4 and OP 10

No glare found

PV array 4 and OP 11

No glare found

PV array 4 and OP 12

No glare found

PV array 4 and OP 13

No glare found

PV array 4 and OP 14

No glare found

PV array 4 and OP 15

No glare found

PV array 4 and OP 16

No glare found

PV array 4 and OP 17

No glare found

PV array 4 and OP 18

No glare found

PV array 4 and OP 19

No glare found

PV array 4 and OP 20

No glare found

PV array 4 and OP 21

No glare found

PV array 4 and OP 22

No glare found

PV array 4 and OP 23

No glare found

PV array 4 and OP 24

No glare found

PV array 4 and OP 25

No glare found

PV array 4 and OP 26

No glare found

PV array 4 and OP 27

No glare found

PV array 4 and OP 28

No glare found

PV array 4 and OP 29

No glare found

PV array 4 and OP 30

No glare found

PV array 4 and OP 31

No glare found

PV array 4 and OP 32

No glare found

PV array 4 and OP 33

No glare found

PV array 4 and OP 34

No glare found

PV array 4 and OP 35

No glare found

PV array 4 and OP 36

No glare found

PV array 4 and OP 37

No glare found

PV array 4 and OP 38

No glare found

PV array 4 and OP 39

No glare found

PV array 4 and OP 40

No glare found

PV: PV array 5 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 5 and Route: Kooringaroo Road

No glare found

PV array 5 and Route: Windellama Road

No glare found

PV array 5 and FP: FP 1

No glare found

PV array 5 and FP: FP 2

No glare found

PV array 5 and OP 1

No glare found

PV array 5 and OP 2

No glare found

PV array 5 and OP 3

No glare found

PV array 5 and OP 4

No glare found

PV array 5 and OP 5

No glare found

PV array 5 and OP 6

No glare found

PV array 5 and OP 7

No glare found

PV array 5 and OP 8

No glare found

PV array 5 and OP 9

No glare found

PV array 5 and OP 10

No glare found

PV array 5 and OP 11

No glare found

PV array 5 and OP 12

No glare found

PV array 5 and OP 13

No glare found

PV array 5 and OP 14

No glare found

PV array 5 and OP 15

No glare found

PV array 5 and OP 16

No glare found

PV array 5 and OP 17

No glare found

PV array 5 and OP 18

No glare found

PV array 5 and OP 19

No glare found

PV array 5 and OP 20

No glare found

PV array 5 and OP 21

No glare found

PV array 5 and OP 22

No glare found

PV array 5 and OP 23

No glare found

PV array 5 and OP 24

No glare found

PV array 5 and OP 25

No glare found

PV array 5 and OP 26

No glare found

PV array 5 and OP 27

No glare found

PV array 5 and OP 28

No glare found

PV array 5 and OP 29

No glare found

PV array 5 and OP 30

No glare found

PV array 5 and OP 31

No glare found

PV array 5 and OP 32

No glare found

PV array 5 and OP 33

No glare found

PV array 5 and OP 34

No glare found

PV array 5 and OP 35

No glare found

PV array 5 and OP 36

No glare found

PV array 5 and OP 37

No glare found

PV array 5 and OP 38

No glare found

PV array 5 and OP 39

No glare found

PV array 5 and OP 40

No glare found

PV: PV array 6 low potential for temporary after-image

Receptor results ordered by category of glare

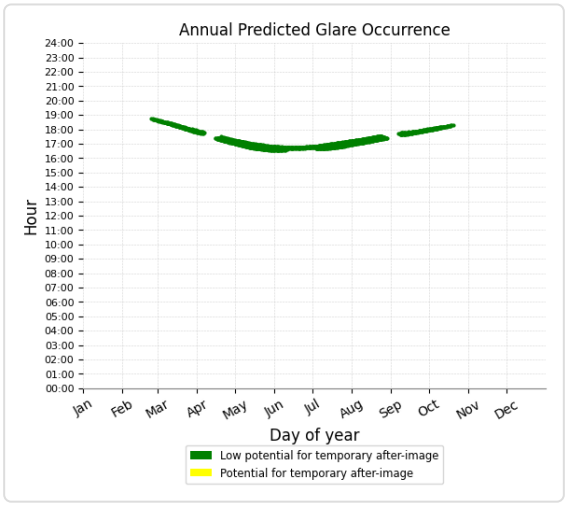
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	1,806	30.1	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 3	410	6.8	0	0.0
OP 32	157	2.6	0	0.0
OP 33	343	5.7	0	0.0
OP 34	243	4.0	0	0.0
OP 35	186	3.1	0	0.0
OP 38	169	2.8	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0

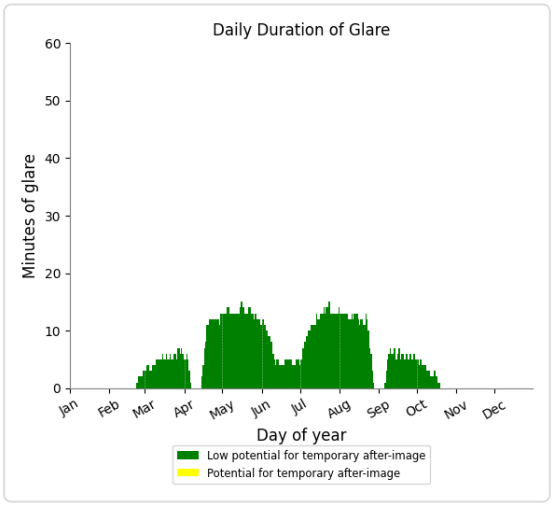
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 31	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

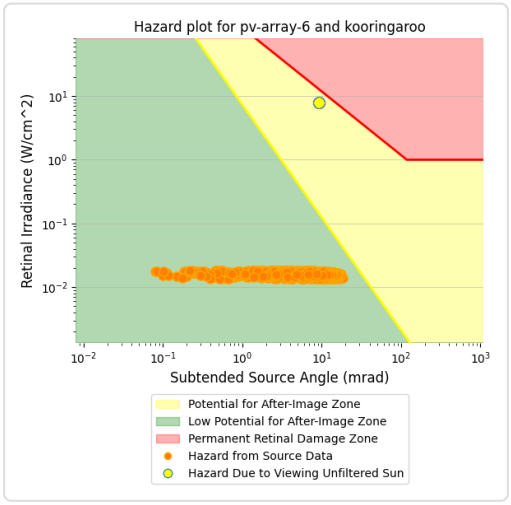
PV array 6 and Route: Kooringaroo Road

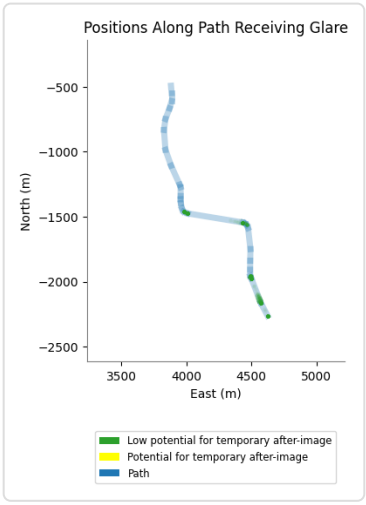
Yellow glare: none

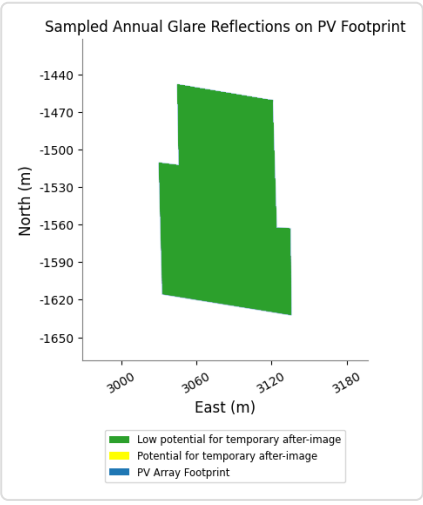
Green glare: 1,806 min.











PV array 6 and Route: Windellama Road

No glare found

PV array 6 and FP: FP 1

No glare found

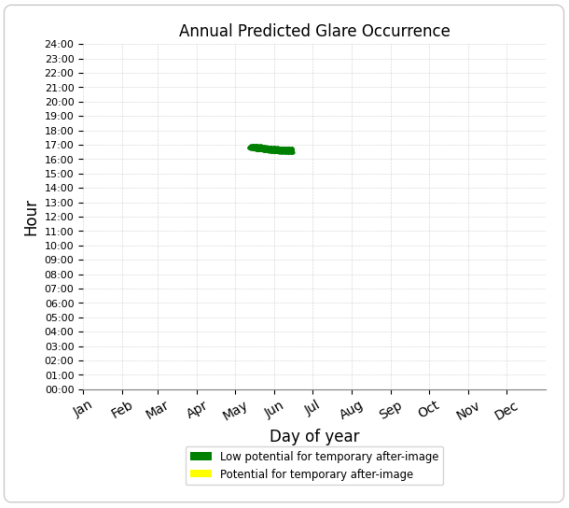
PV array 6 and FP: FP 2

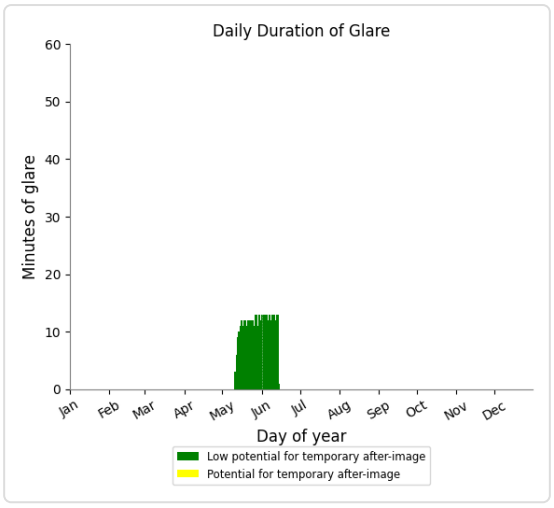
No glare found

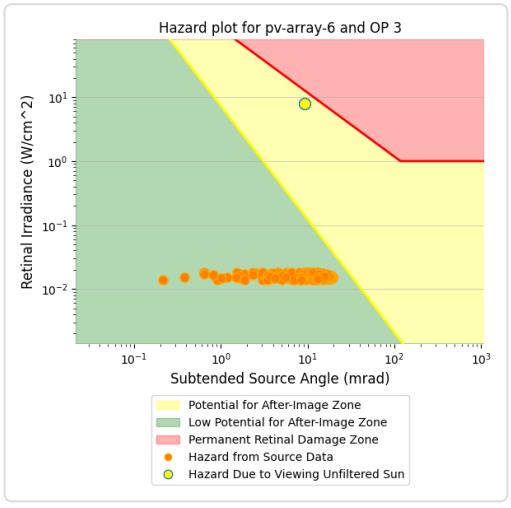
PV array 6 and OP 3

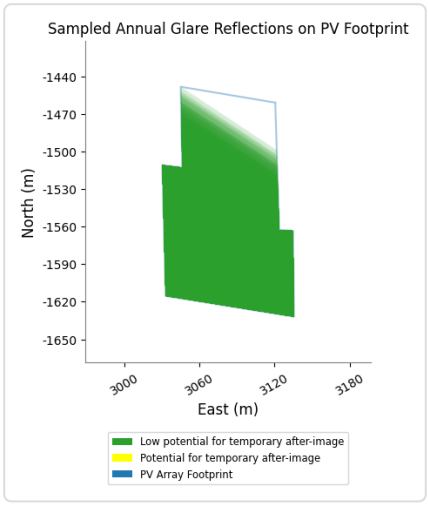
Yellow glare: none

Green glare: 410 min.





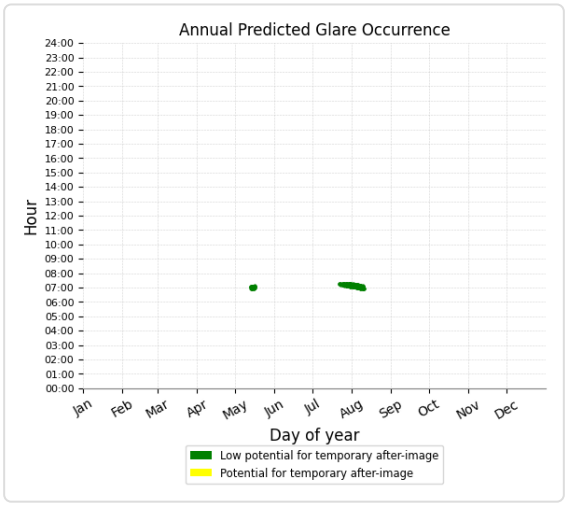


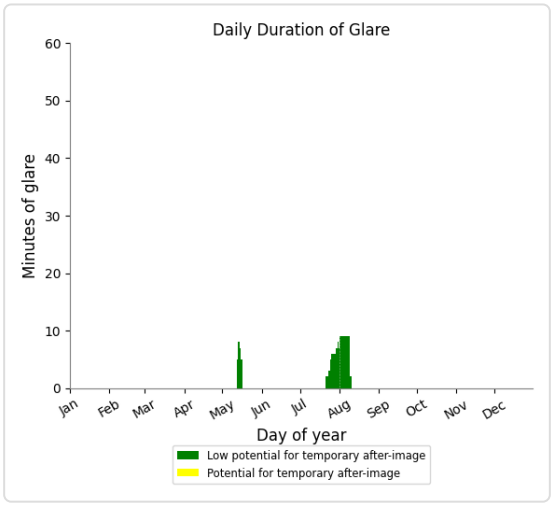


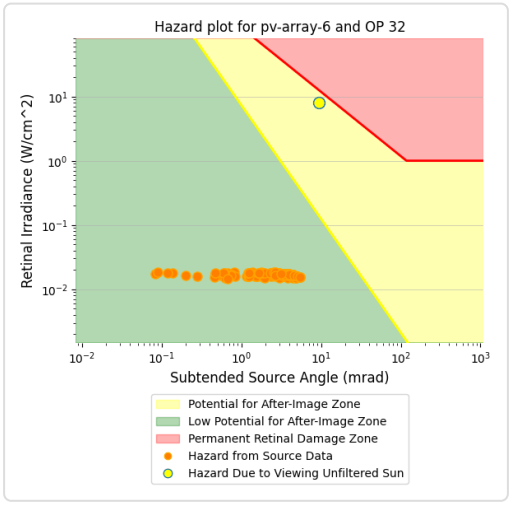
PV array 6 and OP 32

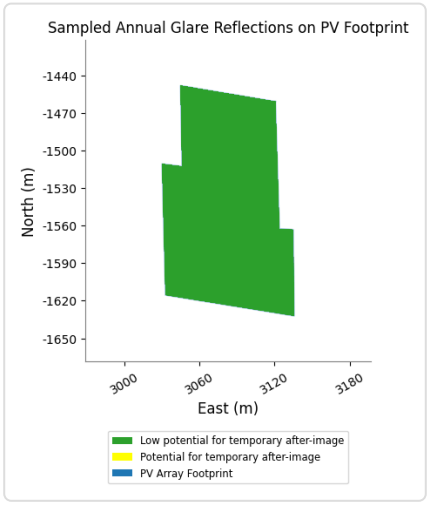
Yellow glare: none

Green glare: 157 min.





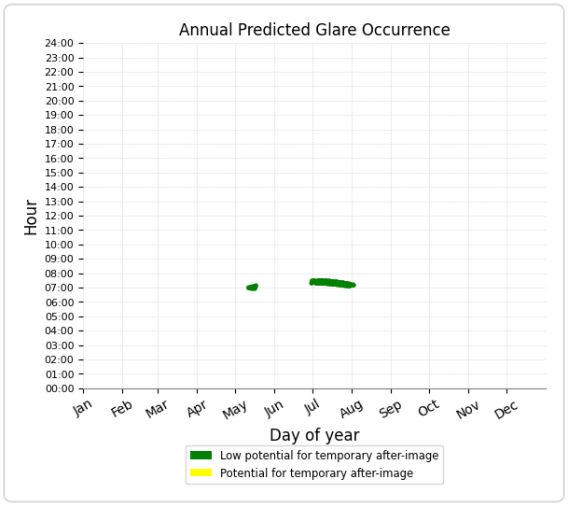


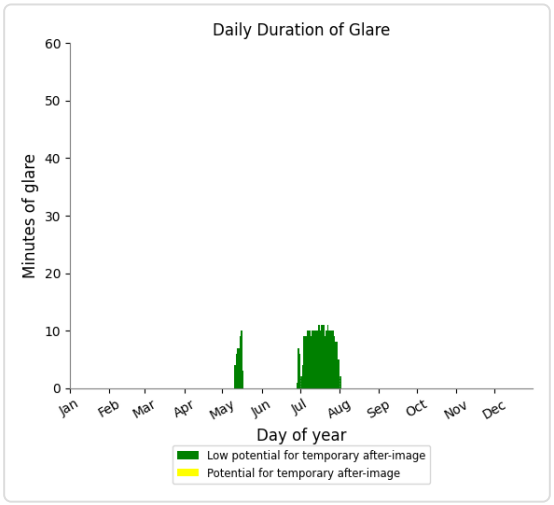


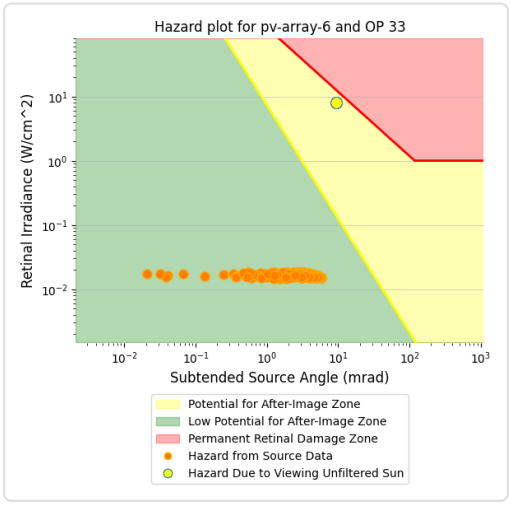
PV array 6 and OP 33

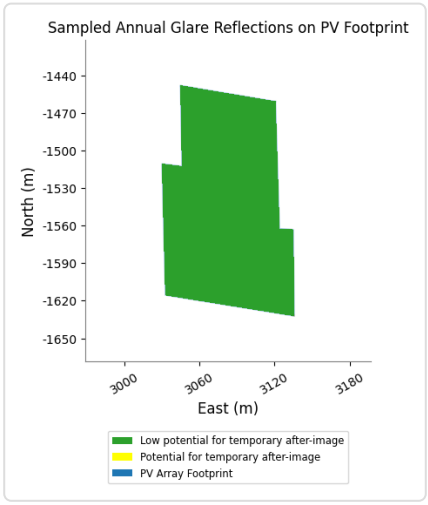
Yellow glare: none

Green glare: 343 min.





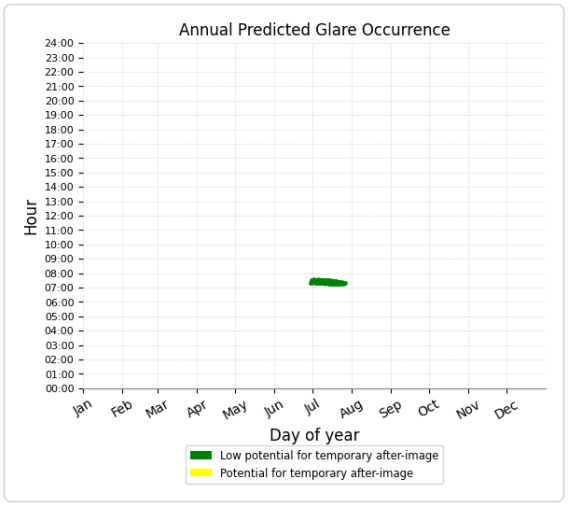


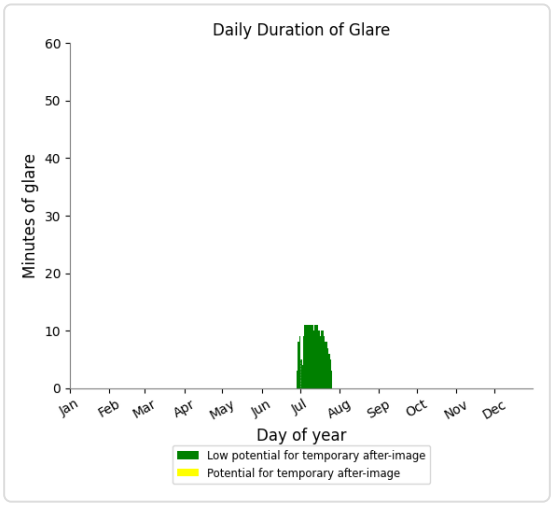


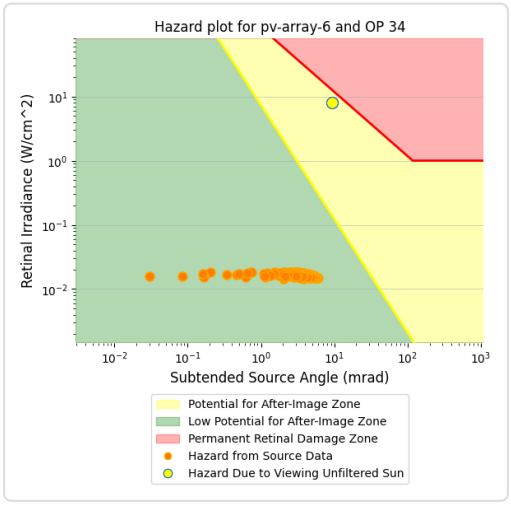
PV array 6 and OP 34

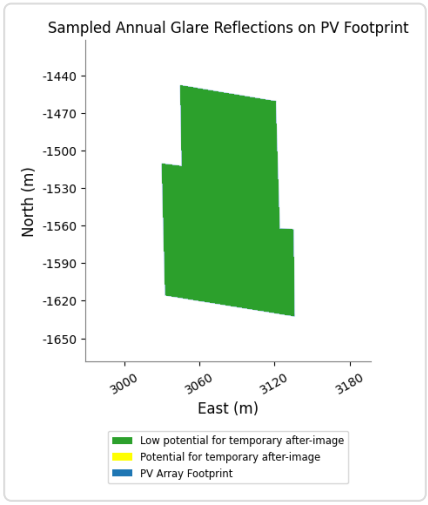
Yellow glare: none

Green glare: 243 min.





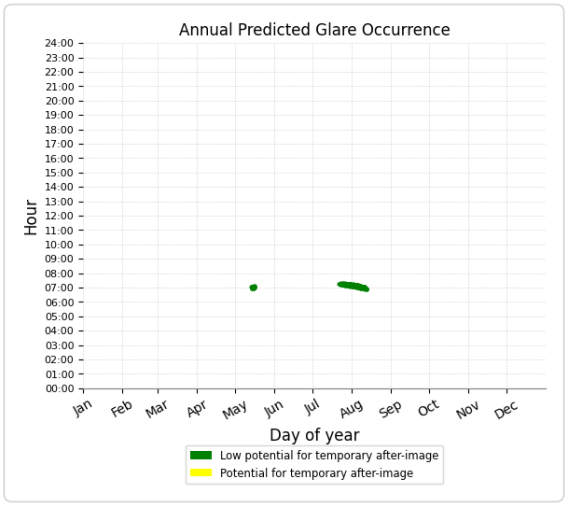


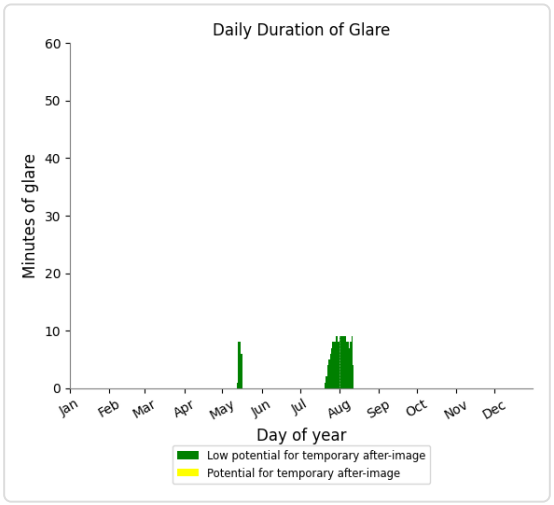


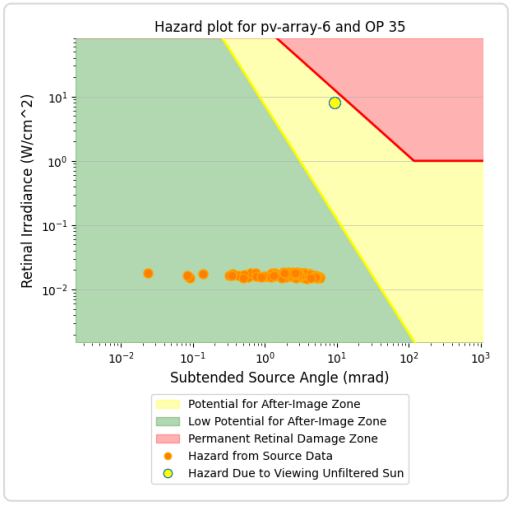
PV array 6 and OP 35

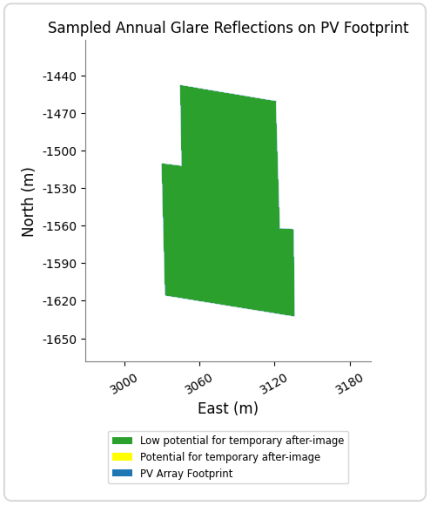
Yellow glare: none

Green glare: 186 min.





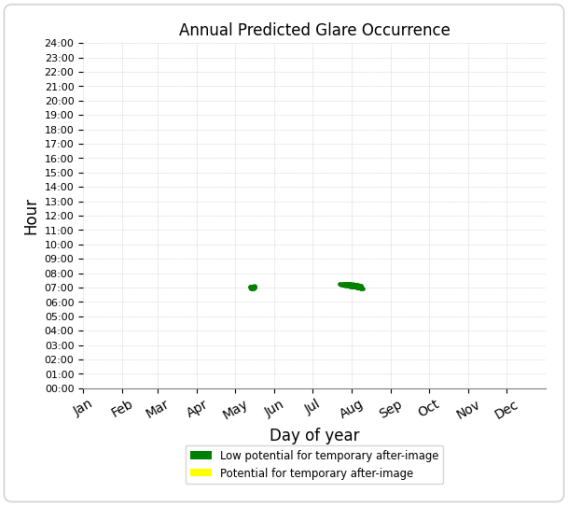


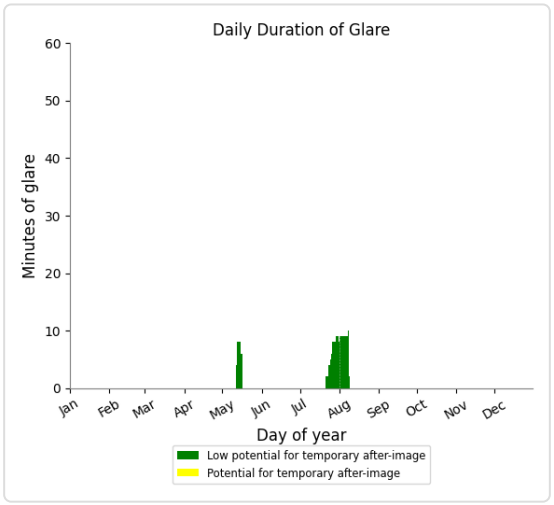


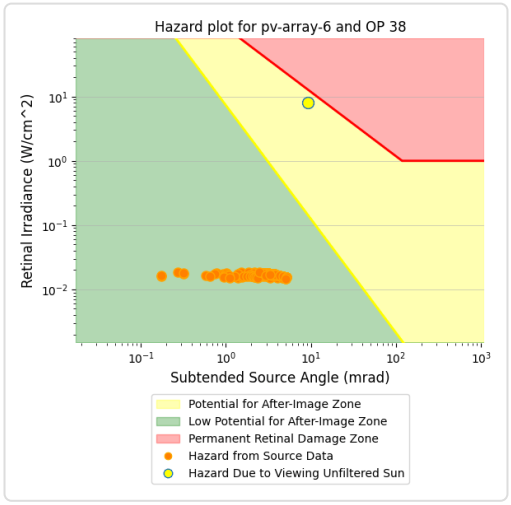
PV array 6 and OP 38

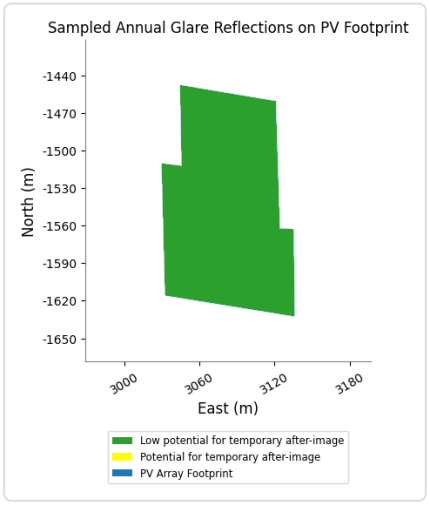
Yellow glare: none

Green glare: 169 min.









PV array 6 and OP 1

No glare found

PV array 6 and OP 2

No glare found

PV array 6 and OP 4

No glare found

PV array 6 and OP 5

No glare found

PV array 6 and OP 6

No glare found

PV array 6 and OP 7

No glare found

PV array 6 and OP 8

No glare found

PV array 6 and OP 9

No glare found

PV array 6 and OP 10

No glare found

PV array 6 and OP 11

No glare found

PV array 6 and OP 12

No glare found

PV array 6 and OP 13

No glare found

PV array 6 and OP 14

No glare found

PV array 6 and OP 15

No glare found

PV array 6 and OP 16

No glare found

PV array 6 and OP 17

No glare found

PV array 6 and OP 18

No glare found

PV array 6 and OP 19

No glare found

PV array 6 and OP 20

No glare found

PV array 6 and OP 21

No glare found

PV array 6 and OP 22

No glare found

PV array 6 and OP 23

No glare found

PV array 6 and OP 24

No glare found

PV array 6 and OP 25

No glare found

PV array 6 and OP 26

No glare found

PV array 6 and OP 27

No glare found

PV array 6 and OP 28

No glare found

PV array 6 and OP 29

No glare found

PV array 6 and OP 30

No glare found

PV array 6 and OP 31

No glare found

PV array 6 and OP 36

No glare found

PV array 6 and OP 37

No glare found

PV array 6 and OP 39

No glare found

PV array 6 and OP 40

No glare found

PV: PV array 7 potential temporary after-image

Receptor results ordered by category of glare

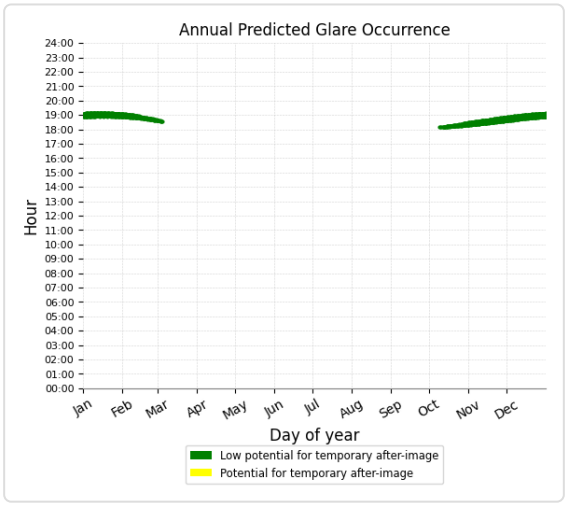
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	1,327	22.1	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 28	372	6.2	142	2.4
OP 29	288	4.8	283	4.7
OP 30	905	15.1	39	0.7
OP 31	1,032	17.2	24	0.4
OP 40	342	5.7	145	2.4
OP 7	89	1.5	0	0.0
OP 8	201	3.4	0	0.0
OP 9	363	6.0	0	0.0
OP 27	24	0.4	0	0.0
OP 37	539	9.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0

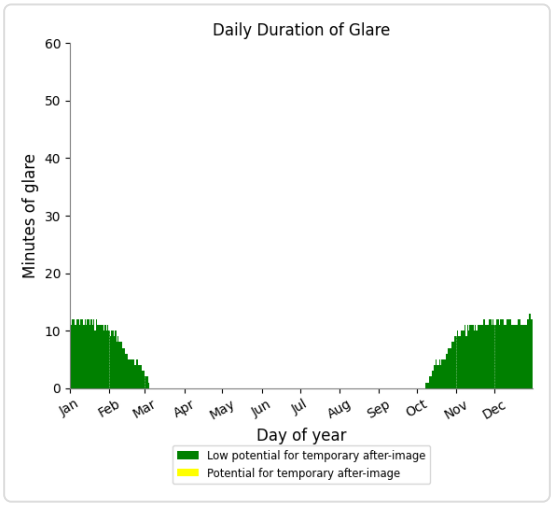
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0

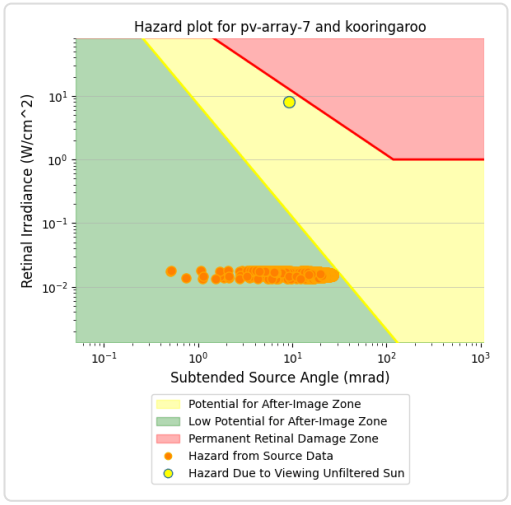
PV array 7 and Route: Kooringaroo Road

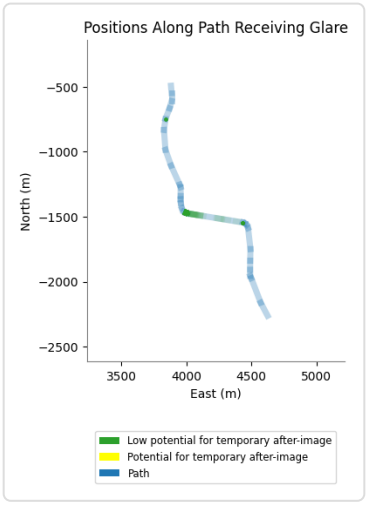
Yellow glare: none

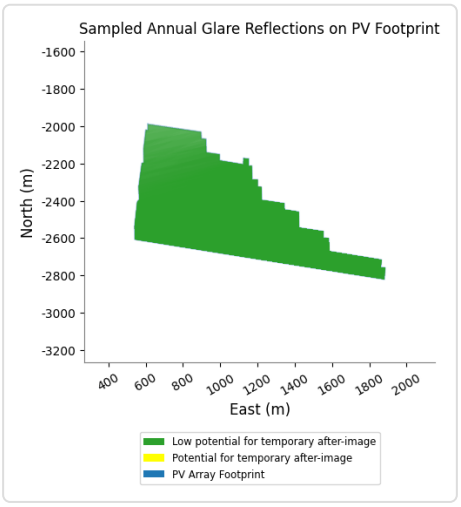
Green glare: 1,327 min.











PV array 7 and Route: Windellama Road

No glare found

PV array 7 and FP: FP 1

No glare found

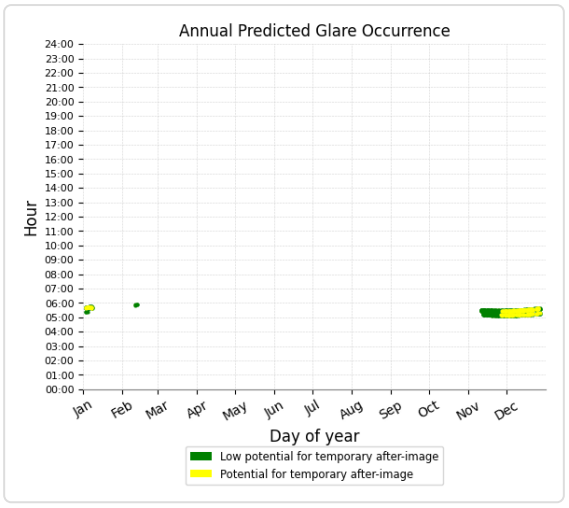
PV array 7 and FP: FP 2

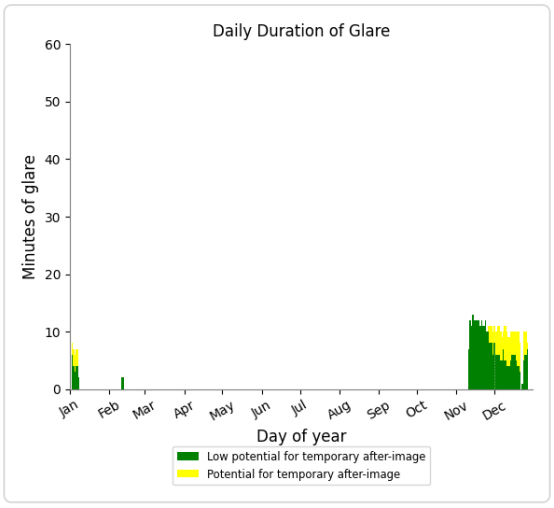
No glare found

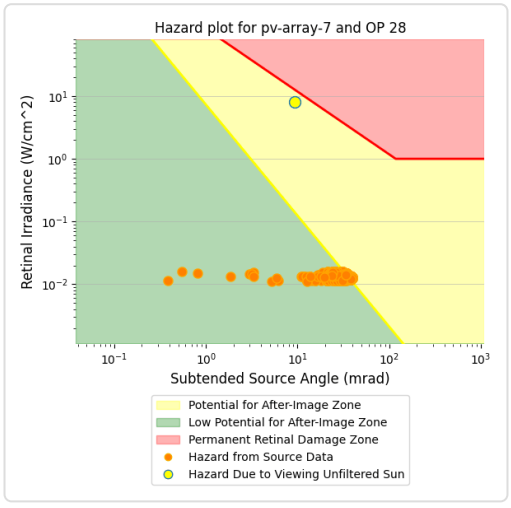
PV array 7 and OP 28

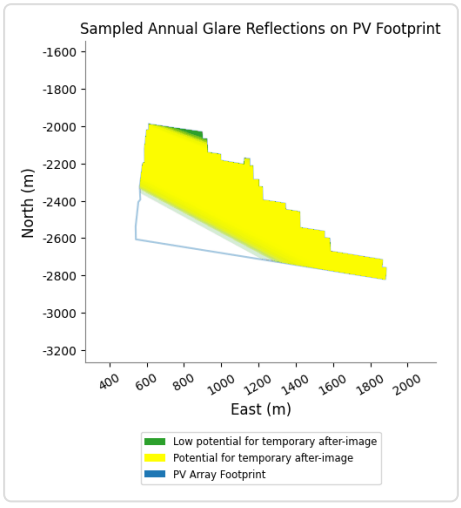
Yellow glare: 142 min.

Green glare: 372 min.





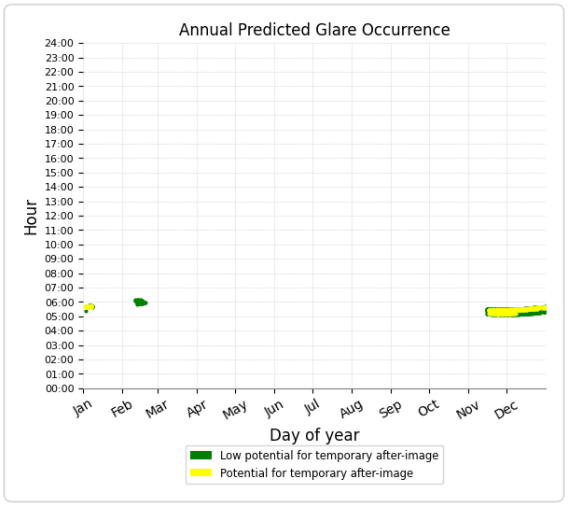


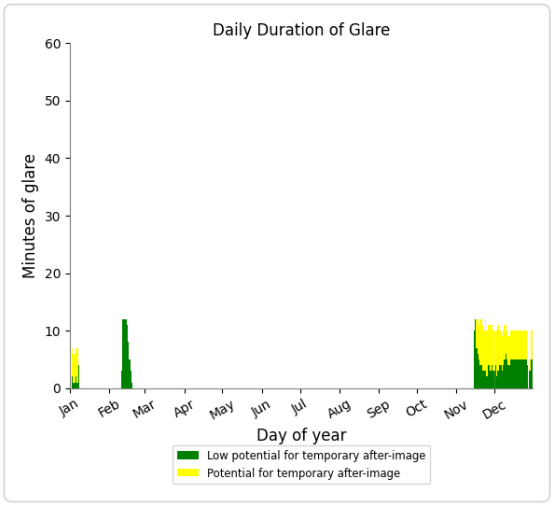


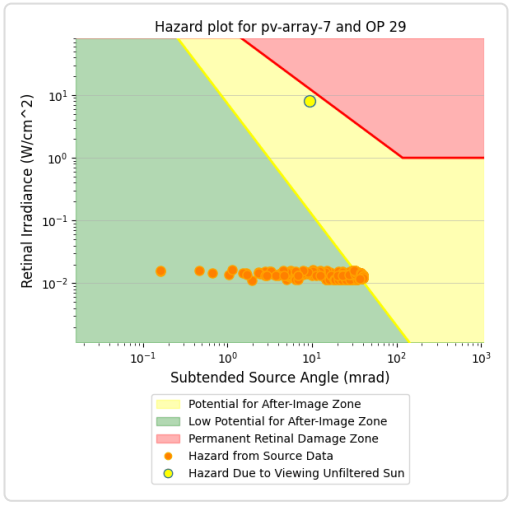
PV array 7 and OP 29

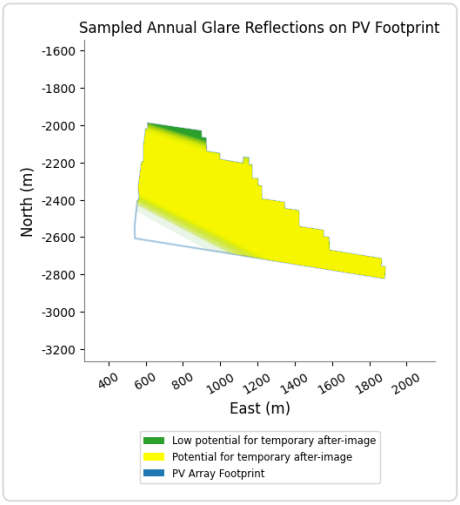
Yellow glare: 283 min.

Green glare: 288 min.





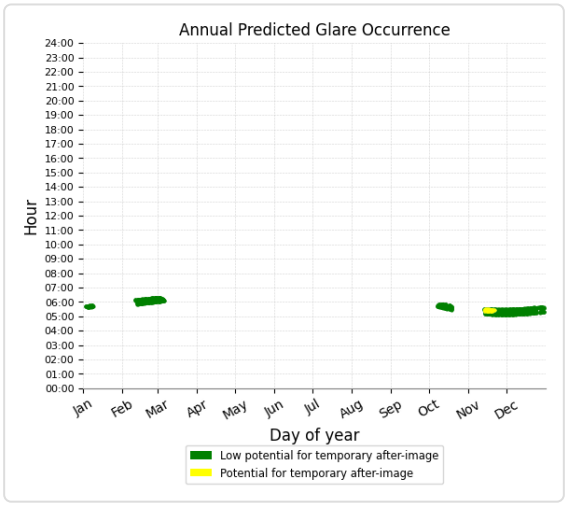


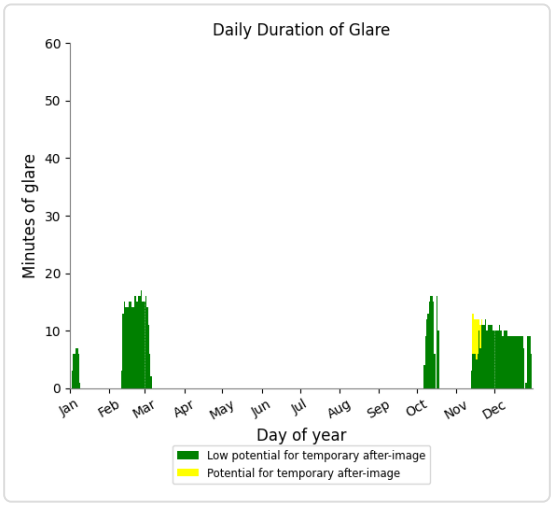


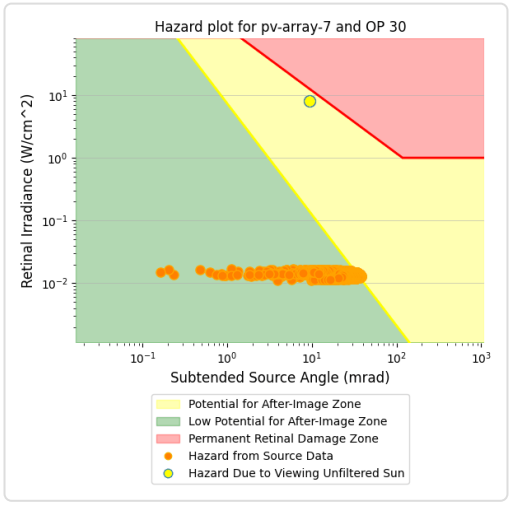
PV array 7 and OP 30

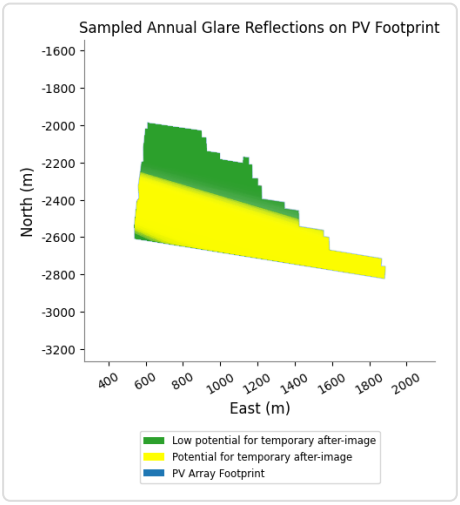
Yellow glare: 39 min.

Green glare: 905 min.





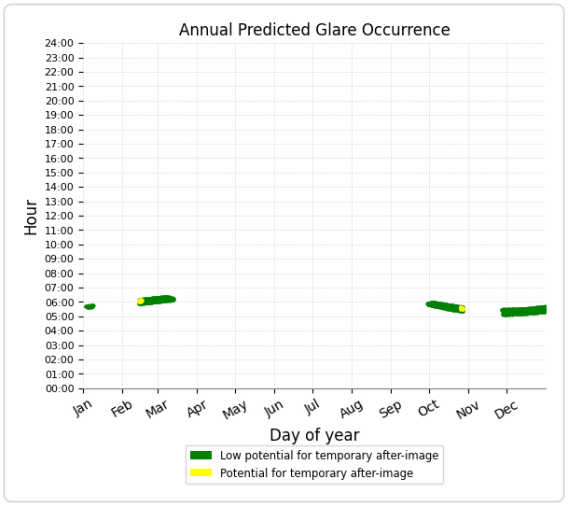


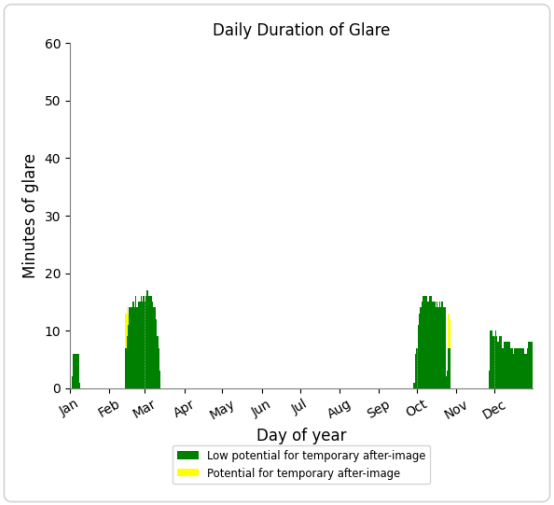


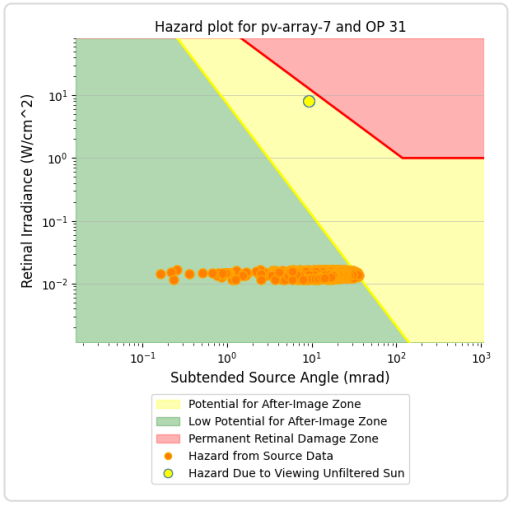
PV array 7 and OP 31

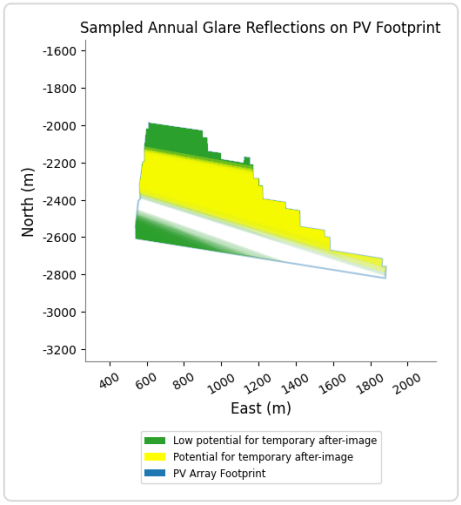
Yellow glare: 24 min.

Green glare: 1,032 min.





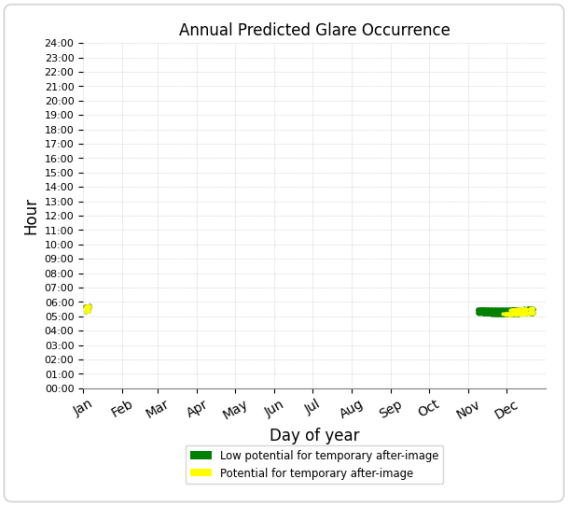


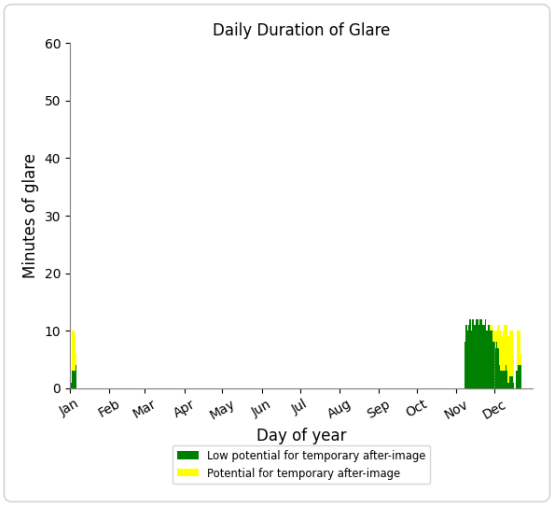


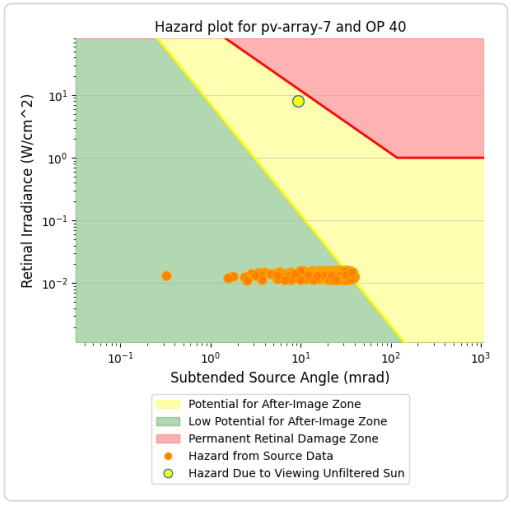
PV array 7 and OP 40

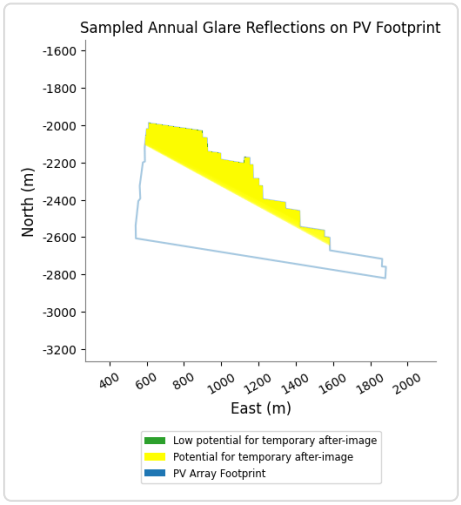
Yellow glare: 145 min.

Green glare: 342 min.





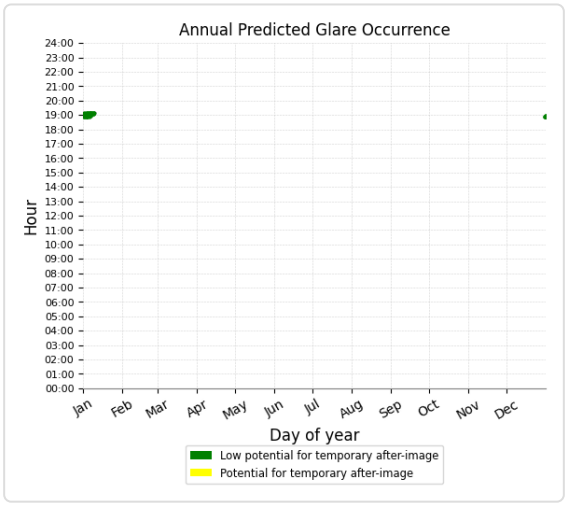


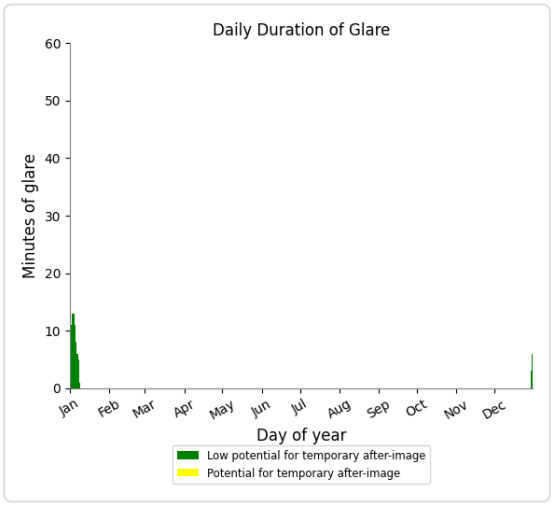


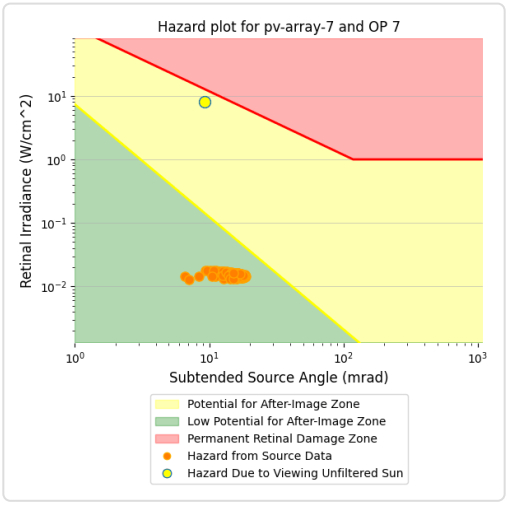
PV array 7 and OP 7

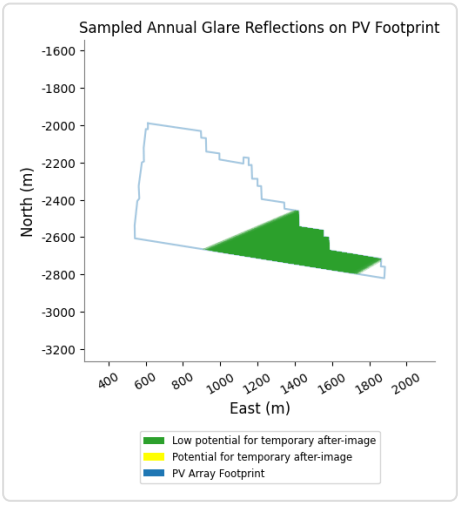
Yellow glare: none

Green glare: 89 min.





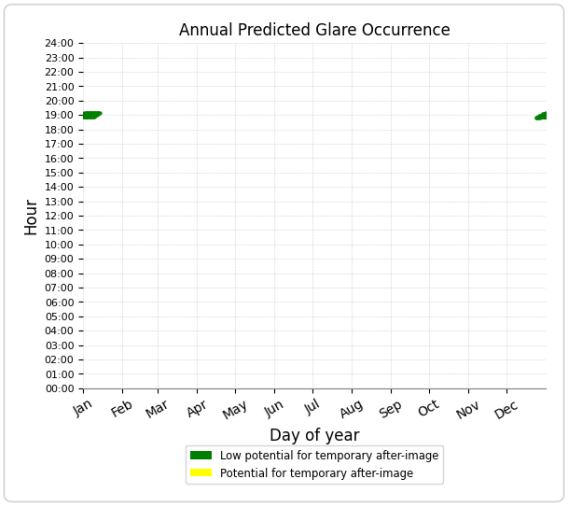


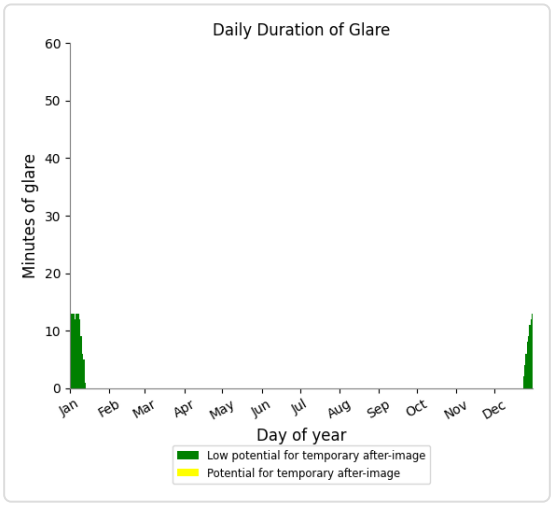


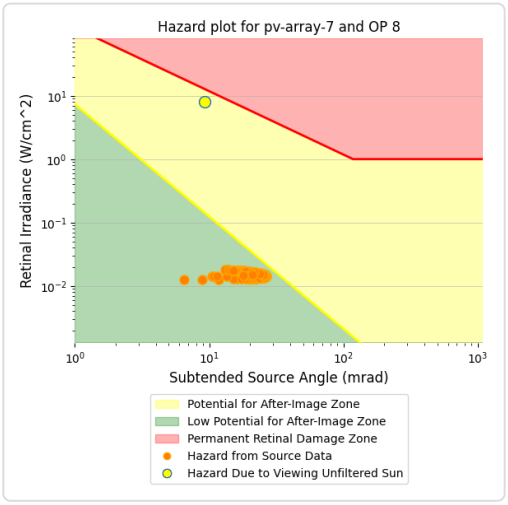
PV array 7 and OP 8

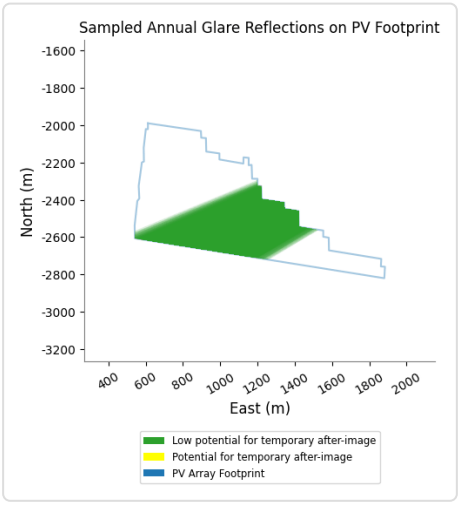
Yellow glare: none

Green glare: 201 min.





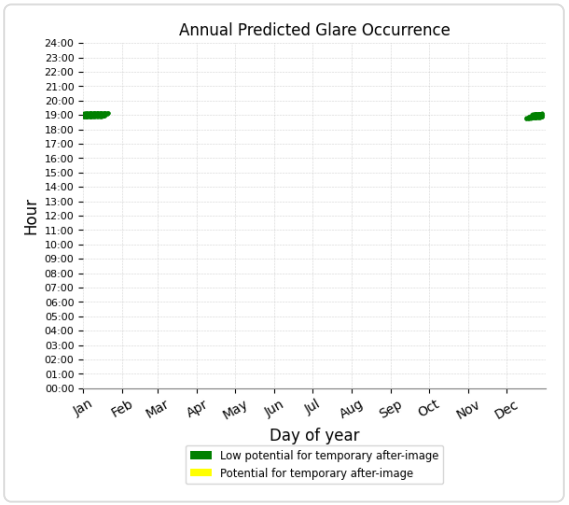


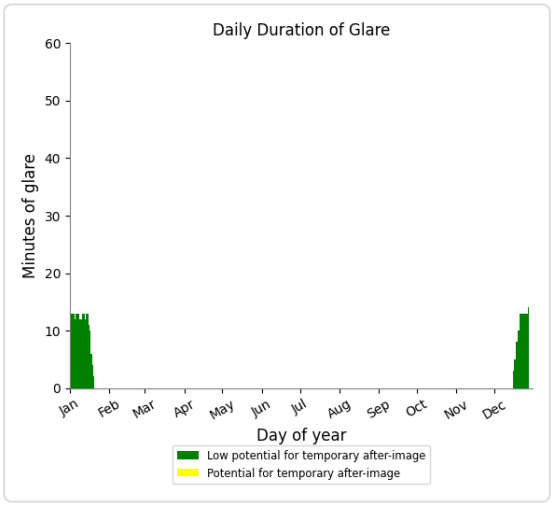


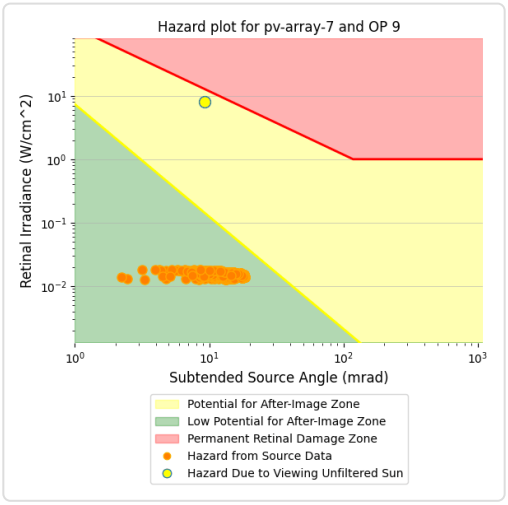
PV array 7 and OP 9

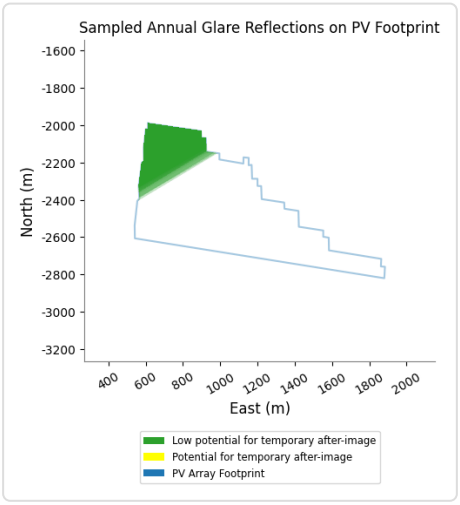
Yellow glare: none

Green glare: 363 min.





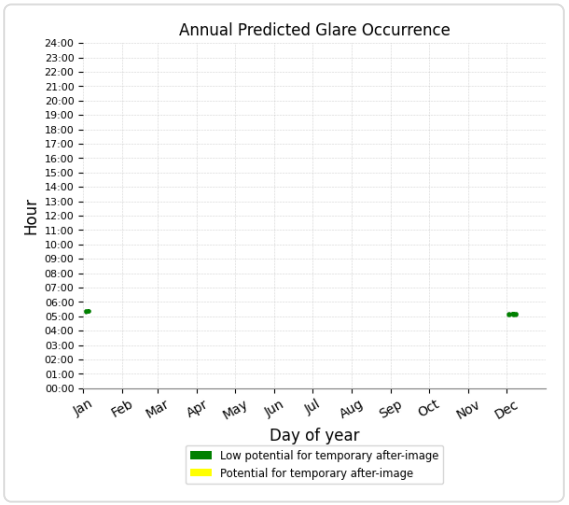


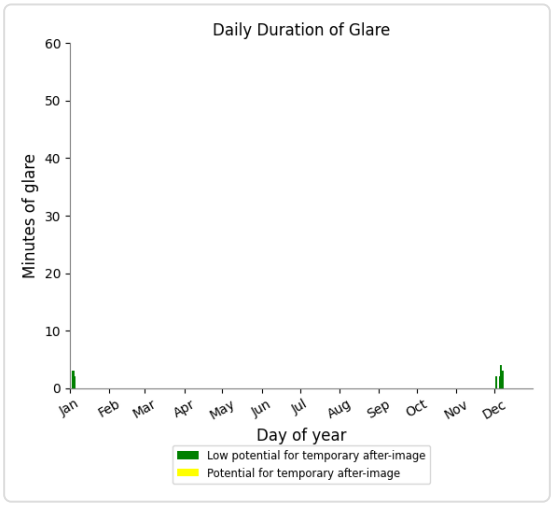


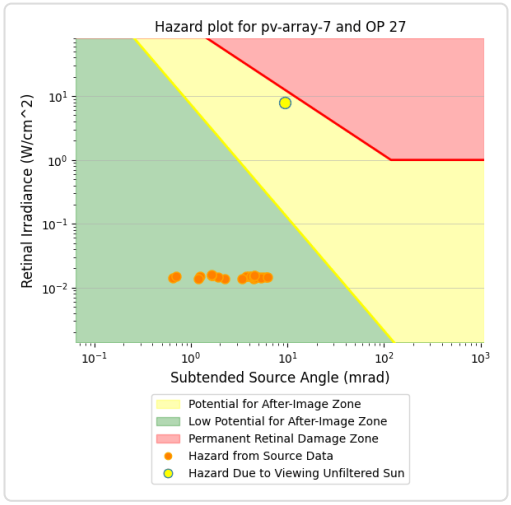
PV array 7 and OP 27

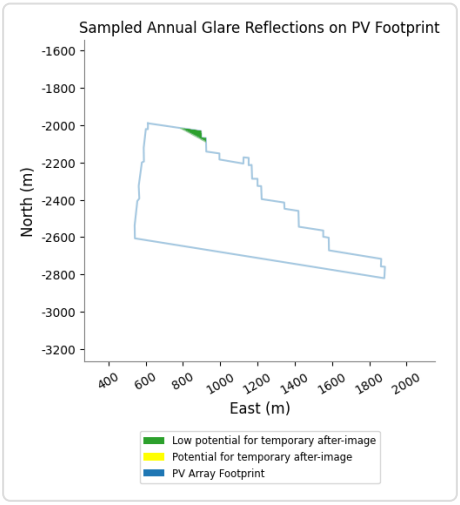
Yellow glare: none

Green glare: 24 min.





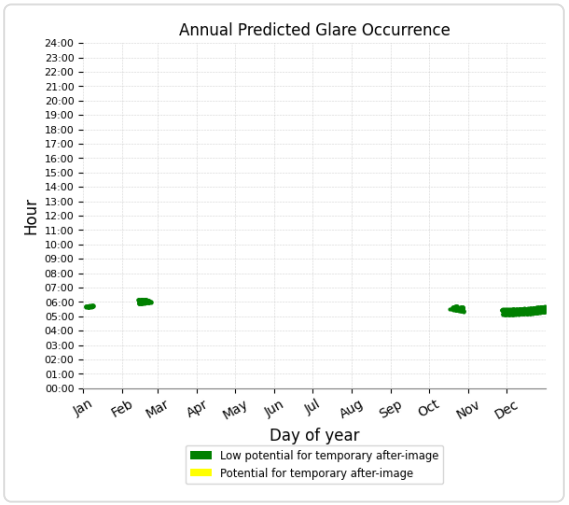


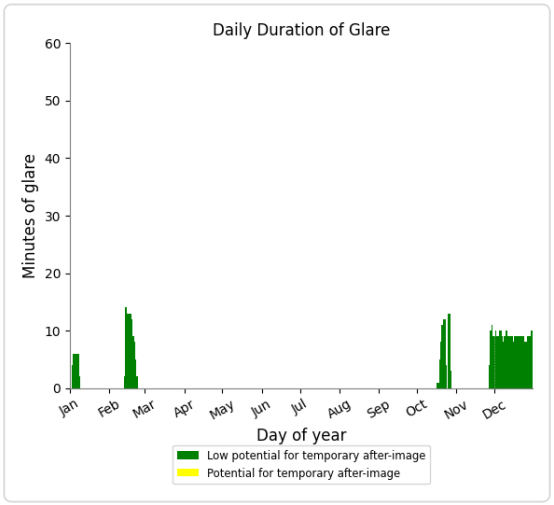


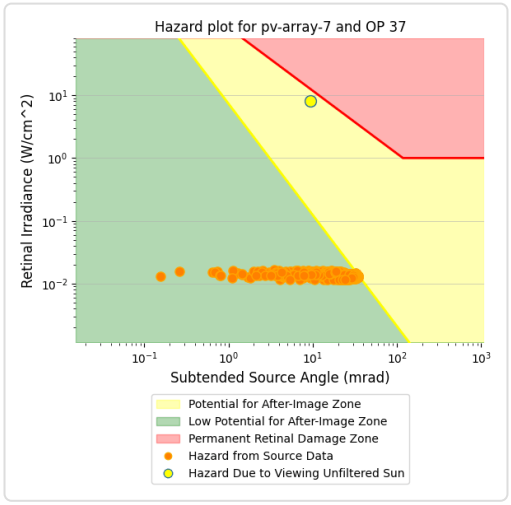
PV array 7 and OP 37

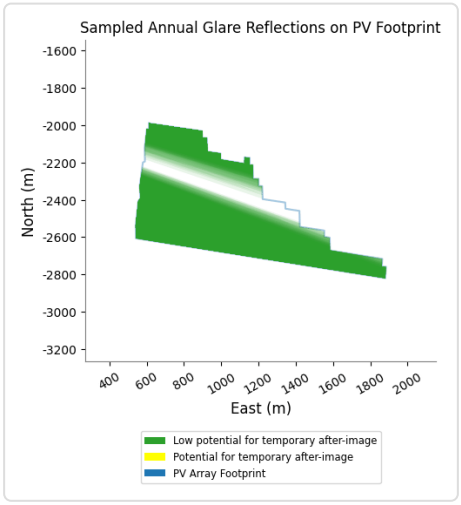
Yellow glare: none

Green glare: 539 min.









PV array 7 and OP 1

No glare found

PV array 7 and OP 2

No glare found

PV array 7 and OP 3

No glare found

PV array 7 and OP 4

No glare found

PV array 7 and OP 5

No glare found

PV array 7 and OP 6

No glare found

PV array 7 and OP 10

No glare found

PV array 7 and OP 11

No glare found

PV array 7 and OP 12

No glare found

PV array 7 and OP 13

No glare found

PV array 7 and OP 14

No glare found

PV array 7 and OP 15

No glare found

PV array 7 and OP 16

No glare found

PV array 7 and OP 17

No glare found

PV array 7 and OP 18

No glare found

PV array 7 and OP 19

No glare found

PV array 7 and OP 20

No glare found

PV array 7 and OP 21

No glare found

PV array 7 and OP 22

No glare found

PV array 7 and OP 23

No glare found

PV array 7 and OP 24

No glare found

PV array 7 and OP 25

No glare found

PV array 7 and OP 26

No glare found

PV array 7 and OP 32

No glare found

PV array 7 and OP 33

No glare found

PV array 7 and OP 34

No glare found

PV array 7 and OP 35

No glare found

PV array 7 and OP 36

No glare found

PV array 7 and OP 38

No glare found

PV array 7 and OP 39

No glare found

PV: PV array 8 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 8 and Route: Kooringaroo Road

No glare found

PV array 8 and Route: Windellama Road

No glare found

PV array 8 and FP: FP 1

No glare found

PV array 8 and FP: FP 2

No glare found

PV array 8 and OP 1

No glare found

PV array 8 and OP 2

No glare found

PV array 8 and OP 3

No glare found

PV array 8 and OP 4

No glare found

PV array 8 and OP 5

No glare found

PV array 8 and OP 6

No glare found

PV array 8 and OP 7

No glare found

PV array 8 and OP 8

No glare found

PV array 8 and OP 9

No glare found

PV array 8 and OP 10

No glare found

PV array 8 and OP 11

No glare found

PV array 8 and OP 12

No glare found

PV array 8 and OP 13

No glare found

PV array 8 and OP 14

No glare found

PV array 8 and OP 15

No glare found

PV array 8 and OP 16

No glare found

PV array 8 and OP 17

No glare found

PV array 8 and OP 18

No glare found

PV array 8 and OP 19

No glare found

PV array 8 and OP 20

No glare found

PV array 8 and OP 21

No glare found

PV array 8 and OP 22

No glare found

PV array 8 and OP 23

No glare found

PV array 8 and OP 24

No glare found

PV array 8 and OP 25

No glare found

PV array 8 and OP 26

No glare found

PV array 8 and OP 27

No glare found

PV array 8 and OP 28

No glare found

PV array 8 and OP 29

No glare found

PV array 8 and OP 30

No glare found

PV array 8 and OP 31

No glare found

PV array 8 and OP 32

No glare found

PV array 8 and OP 33

No glare found

PV array 8 and OP 34

No glare found

PV array 8 and OP 35

No glare found

PV array 8 and OP 36

No glare found

PV array 8 and OP 37

No glare found

PV array 8 and OP 38

No glare found

PV array 8 and OP 39

No glare found

PV array 8 and OP 40

No glare found

PV: PV array 9 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 9 and Route: Kooringaroo Road

No glare found

PV array 9 and Route: Windellama Road

No glare found

PV array 9 and FP: FP 1

No glare found

PV array 9 and FP: FP 2

No glare found

PV array 9 and OP 1

No glare found

PV array 9 and OP 2

No glare found

PV array 9 and OP 3

No glare found

PV array 9 and OP 4

No glare found

PV array 9 and OP 5

No glare found

PV array 9 and OP 6

No glare found

PV array 9 and OP 7

No glare found

PV array 9 and OP 8

No glare found

PV array 9 and OP 9

No glare found

PV array 9 and OP 10

No glare found

PV array 9 and OP 11

No glare found

PV array 9 and OP 12

No glare found

PV array 9 and OP 13

No glare found

PV array 9 and OP 14

No glare found

PV array 9 and OP 15

No glare found

PV array 9 and OP 16

No glare found

PV array 9 and OP 17

No glare found

PV array 9 and OP 18

No glare found

PV array 9 and OP 19

No glare found

PV array 9 and OP 20

No glare found

PV array 9 and OP 21

No glare found

PV array 9 and OP 22

No glare found

PV array 9 and OP 23

No glare found

PV array 9 and OP 24

No glare found

PV array 9 and OP 25

No glare found

PV array 9 and OP 26

No glare found

PV array 9 and OP 27

No glare found

PV array 9 and OP 28

No glare found

PV array 9 and OP 29

No glare found

PV array 9 and OP 30

No glare found

PV array 9 and OP 31

No glare found

PV array 9 and OP 32

No glare found

PV array 9 and OP 33

No glare found

PV array 9 and OP 34

No glare found

PV array 9 and OP 35

No glare found

PV array 9 and OP 36

No glare found

PV array 9 and OP 37

No glare found

PV array 9 and OP 38

No glare found

PV array 9 and OP 39

No glare found

PV array 9 and OP 40

No glare found

Assumptions

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

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

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

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FORGESOLAR GLARE ANALYSIS

Project: **2321 GUNDARY SOLAR FARM**
Site configuration: **2321 GUNDARY SF B**

Client: UMWELT

Created 04 Sep, 2023
Updated 05 Sep, 2023
Time-step 1 minute
Timezone offset UTC10
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 99384.15924

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
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 10	SA tracking	SA tracking	2,079	34.6	0	0.0	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	210	3.5	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	95	1.6	0	0.0	-
PV array 4	SA tracking	SA tracking	404	6.7	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	630	10.5	0	0.0	-
PV array 7	SA tracking	SA tracking	1,785	29.8	220	3.7	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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.

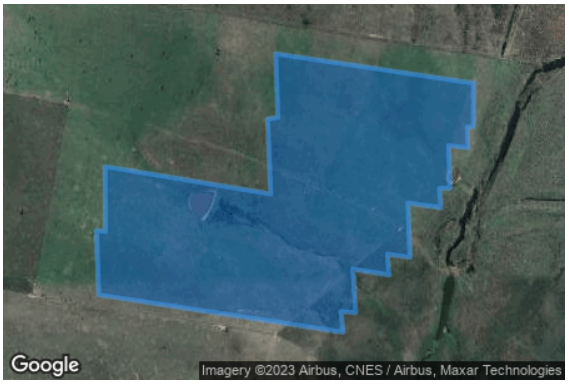
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	389	6.5	0	0.0
OP 2	400	6.7	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	101	1.7	0	0.0
OP 7	225	3.8	0	0.0
OP 8	1,541	25.7	0	0.0
OP 9	811	13.5	0	0.0
OP 10	51	0.8	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 11	0	0.0	0	0.0
OP 12	756	12.6	220	3.7
OP 13	0	0.0	0	0.0
OP 14	713	11.9	0	0.0
OP 15	216	3.6	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840456	149.755350	675.25	1.95	677.20
2	-34.840842	149.758197	672.75	1.95	674.70
3	-34.839794	149.758144	676.52	1.95	678.47
4	-34.839764	149.758322	676.87	1.95	678.82
5	-34.838872	149.758283	677.61	1.95	679.56
6	-34.839286	149.761683	652.30	1.95	654.25
7	-34.839897	149.761681	652.06	1.95	654.01
8	-34.839903	149.761575	653.51	1.95	655.46
9	-34.840194	149.761589	652.81	1.95	654.76
10	-34.840164	149.761253	656.23	1.95	658.18
11	-34.840764	149.761281	653.53	1.95	655.48
12	-34.840764	149.761097	654.88	1.95	656.83
13	-34.841036	149.761122	652.81	1.95	654.76
14	-34.840969	149.760553	656.86	1.95	658.81
15	-34.841733	149.760592	651.87	1.95	653.82
16	-34.841689	149.760203	655.00	1.95	656.95
17	-34.841981	149.760231	653.26	1.95	655.21
18	-34.841897	149.759608	659.68	1.95	661.63
19	-34.842511	149.759658	657.56	1.95	659.51
20	-34.842497	149.759408	659.19	1.95	661.14
21	-34.842786	149.759439	658.50	1.95	660.45
22	-34.842261	149.755242	679.24	1.95	681.19
23	-34.841353	149.755203	676.42	1.95	678.37
24	-34.841369	149.755361	676.81	1.95	678.76

Name: PV array 10
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858406	149.770000	655.09	1.95	657.04
2	-34.859275	149.776911	670.07	1.95	672.02
3	-34.858694	149.776881	667.72	1.95	669.67
4	-34.858422	149.777164	667.36	1.95	669.31
5	-34.858517	149.777869	669.53	1.95	671.48
6	-34.857853	149.777822	668.66	1.95	670.61
7	-34.857567	149.778106	669.19	1.95	671.14
8	-34.857733	149.779386	673.06	1.95	675.01
9	-34.858044	149.779392	674.91	1.95	676.86
10	-34.858317	149.781619	676.41	1.95	678.36
11	-34.859039	149.781789	677.78	1.95	679.73
12	-34.859308	149.781792	679.96	1.95	681.91
13	-34.859375	149.782231	679.89	1.95	681.84
14	-34.859536	149.782239	681.33	1.95	683.28
15	-34.859567	149.782506	681.61	1.95	683.56
16	-34.860022	149.782522	686.44	1.95	688.39
17	-34.860122	149.783111	688.43	1.95	690.38
18	-34.859500	149.783086	682.00	1.95	683.95
19	-34.859569	149.783803	683.21	1.95	685.16
20	-34.859289	149.783789	681.37	1.95	683.32
21	-34.859447	149.785550	682.53	1.95	684.48
22	-34.858550	149.785517	679.87	1.95	681.82
23	-34.858550	149.785744	680.18	1.95	682.13
24	-34.857958	149.785717	677.91	1.95	679.86
25	-34.858142	149.787292	680.38	1.95	682.33
26	-34.858758	149.787306	683.68	1.95	685.63
27	-34.858850	149.787914	683.32	1.95	685.27
28	-34.859147	149.787919	684.39	1.95	686.34
29	-34.859217	149.788481	683.00	1.95	684.95
30	-34.859839	149.788483	684.87	1.95	686.82
31	-34.859889	149.788428	685.10	1.95	687.05
32	-34.860054	149.788430	685.75	1.95	687.70
33	-34.860358	149.788434	687.01	1.95	688.96
34	-34.860727	149.788435	688.51	1.95	690.46
35	-34.861000	149.788452	689.51	1.95	691.46
36	-34.861206	149.788459	689.25	1.95	691.20
37	-34.861380	149.788465	689.05	1.95	691.00
38	-34.861585	149.788469	688.82	1.95	690.77
39	-34.861731	149.788458	689.04	1.95	690.99
40	-34.861660	149.787962	691.38	1.95	693.33
41	-34.861623	149.787682	693.41	1.95	695.36
42	-34.861578	149.787337	694.64	1.95	696.59
43	-34.861491	149.786699	694.22	1.95	696.17
44	-34.861439	149.786264	691.51	1.95	693.46
45	-34.861253	149.784794	688.21	1.95	690.16
46	-34.861211	149.784530	689.95	1.95	691.90
47	-34.861151	149.784191	691.97	1.95	693.92
48	-34.861125	149.784062	692.51	1.95	694.46
49	-34.861102	149.783899	693.26	1.95	695.21
50	-34.861085	149.783822	693.65	1.95	695.60
51	-34.861071	149.783685	694.25	1.95	696.20
52	-34.861043	149.783443	695.39	1.95	697.34
53	-34.859242	149.769586	655.35	1.95	657.30
54	-34.858619	149.769571	655.00	1.95	656.95
55	-34.858669	149.769994	655.22	1.95	657.17

Name: PV array 11
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854928	149.786786	682.51	1.95	684.46
2	-34.855153	149.788475	685.33	1.95	687.28
3	-34.855178	149.788637	684.59	1.95	686.54
4	-34.855197	149.788745	684.14	1.95	686.09
5	-34.855216	149.788878	683.68	1.95	685.63
6	-34.855257	149.789198	684.90	1.95	686.85
7	-34.855306	149.789552	687.26	1.95	689.21
8	-34.855581	149.791525	700.41	1.95	702.36
9	-34.854836	149.791494	701.31	1.95	703.26
10	-34.854864	149.791889	701.91	1.95	703.86
11	-34.854581	149.791869	701.25	1.95	703.20
12	-34.854628	149.792308	701.24	1.95	703.19
13	-34.854017	149.792292	699.50	1.95	701.45
14	-34.854047	149.792558	699.02	1.95	700.97
15	-34.853761	149.792550	699.97	1.95	701.92
16	-34.853831	149.793075	699.31	1.95	701.26
17	-34.854142	149.793086	698.06	1.95	700.01
18	-34.854433	149.795772	705.20	1.95	707.15
19	-34.855344	149.795817	705.80	1.95	707.75
20	-34.856011	149.795669	708.16	1.95	710.11
21	-34.856144	149.795500	709.31	1.95	711.26
22	-34.856744	149.795525	708.98	1.95	710.93
23	-34.856639	149.794693	710.56	1.95	712.51
24	-34.856929	149.794705	710.54	1.95	712.49
25	-34.856917	149.794600	710.75	1.95	712.70
26	-34.857533	149.794625	709.83	1.95	711.78
27	-34.857822	149.794578	709.08	1.95	711.03
28	-34.857867	149.794406	709.56	1.95	711.51
29	-34.858489	149.794442	706.20	1.95	708.15
30	-34.858772	149.794394	704.16	1.95	706.11
31	-34.858753	149.794222	704.23	1.95	706.18
32	-34.859358	149.794253	699.89	1.95	701.84
33	-34.859356	149.794136	699.89	1.95	701.84
34	-34.859644	149.794147	697.80	1.95	699.75
35	-34.859267	149.791322	687.69	1.95	689.64
36	-34.858947	149.791308	688.01	1.95	689.96
37	-34.858900	149.790925	685.57	1.95	687.52
38	-34.858286	149.790900	686.54	1.95	688.49
39	-34.858083	149.789519	683.80	1.95	685.75
40	-34.857792	149.789519	683.80	1.95	685.75
41	-34.857742	149.789139	683.25	1.95	685.20
42	-34.857125	149.789114	683.46	1.95	685.41
43	-34.857064	149.788703	682.21	1.95	684.16
44	-34.857678	149.788719	682.27	1.95	684.22
45	-34.857631	149.788367	681.25	1.95	683.20
46	-34.856964	149.788344	681.16	1.95	683.11
47	-34.856719	149.786636	678.00	1.95	679.95
48	-34.856106	149.786614	679.61	1.95	681.56
49	-34.855211	149.786697	681.71	1.95	683.66

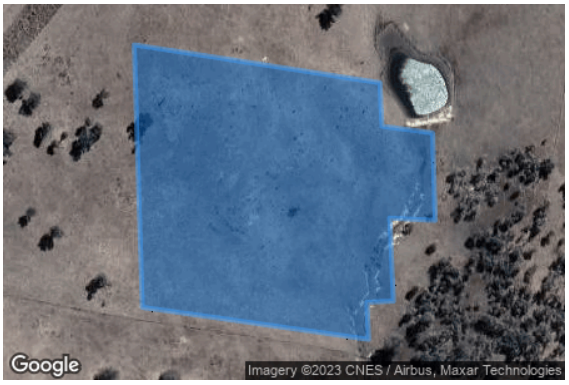
Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.859419	149.769711	655.67	1.95	657.62
2	-34.861188	149.783350	696.52	1.95	698.47
3	-34.861232	149.783715	695.09	1.95	697.04
4	-34.861282	149.784147	693.17	1.95	695.12
5	-34.861345	149.784637	689.71	1.95	691.66
6	-34.862506	149.793494	693.21	1.95	695.16
7	-34.863142	149.793542	694.26	1.95	696.21
8	-34.866122	149.792931	694.11	1.95	696.06
9	-34.865931	149.791367	702.04	1.95	703.99
10	-34.865333	149.791322	703.42	1.95	705.37
11	-34.865036	149.791375	703.20	1.95	705.15
12	-34.865019	149.791258	703.60	1.95	705.55
13	-34.864686	149.790997	703.23	1.95	705.18
14	-34.864553	149.789928	704.25	1.95	706.20
15	-34.863931	149.789911	701.83	1.95	703.78
16	-34.863808	149.789000	698.34	1.95	700.29
17	-34.864411	149.789019	700.24	1.95	702.19
18	-34.864303	149.788022	694.23	1.95	696.18
19	-34.864583	149.788039	694.66	1.95	696.61
20	-34.864439	149.786811	697.29	1.95	699.24
21	-34.865050	149.786856	697.08	1.95	699.03
22	-34.865314	149.786586	697.74	1.95	699.69
23	-34.865150	149.785300	694.98	1.95	696.93
24	-34.864858	149.785286	695.42	1.95	697.37
25	-34.864750	149.784472	695.43	1.95	697.38
26	-34.864730	149.784300	696.07	1.95	698.02
27	-34.864708	149.784110	696.73	1.95	698.68
28	-34.864983	149.784128	696.32	1.95	698.27
29	-34.864675	149.781517	703.05	1.95	705.00
30	-34.864367	149.781494	702.23	1.95	704.18
31	-34.864328	149.781228	700.18	1.95	702.13
32	-34.863703	149.781219	698.95	1.95	700.90
33	-34.863708	149.781372	700.44	1.95	702.39
34	-34.863419	149.781353	699.61	1.95	701.56
35	-34.863236	149.779844	691.61	1.95	693.56
36	-34.863519	149.779856	690.43	1.95	692.38
37	-34.863342	149.778442	682.56	1.95	684.51
38	-34.863936	149.778461	678.80	1.95	680.75
39	-34.863886	149.777744	674.62	1.95	676.57
40	-34.864161	149.777750	672.97	1.95	674.92
41	-34.864058	149.776792	667.31	1.95	669.26
42	-34.863769	149.776778	669.04	1.95	670.99
43	-34.863364	149.773750	660.53	1.95	662.48
44	-34.862753	149.773742	661.26	1.95	663.21
45	-34.862656	149.773025	660.60	1.95	662.55
46	-34.862372	149.773017	661.22	1.95	663.17
47	-34.862250	149.772294	661.76	1.95	663.71
48	-34.861636	149.772283	662.10	1.95	664.05
49	-34.861336	149.770414	657.93	1.95	659.88
50	-34.860978	149.770014	657.15	1.95	659.10
51	-34.860361	149.769983	656.71	1.95	658.66
52	-34.860352	149.769682	655.91	1.95	657.86

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.866069	149.791139	701.41	1.95	703.36
2	-34.866275	149.792711	694.92	1.95	696.87
3	-34.867181	149.792725	694.34	1.95	696.29
4	-34.867058	149.791775	696.40	1.95	698.35
5	-34.866747	149.791756	697.15	1.95	699.10
6	-34.866678	149.791158	699.92	1.95	701.87

Name: PV array 14
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864939	149.782561	702.09	1.95	704.04
2	-34.865206	149.784672	693.63	1.95	695.58
3	-34.865511	149.784689	693.01	1.95	694.96
4	-34.865558	149.785125	694.61	1.95	696.56
5	-34.866172	149.785147	693.39	1.95	695.34
6	-34.866156	149.784756	690.39	1.95	692.34
7	-34.866739	149.784789	688.82	1.95	690.77
8	-34.866747	149.784561	687.86	1.95	689.81
9	-34.867008	149.784575	686.24	1.95	688.19
10	-34.866783	149.782631	699.00	1.95	700.95

Name: PV array 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864660	149.778232	674.47	1.95	676.42
2	-34.864670	149.778331	675.34	1.95	677.29
3	-34.864680	149.778433	676.22	1.95	678.17
4	-34.864698	149.778569	677.49	1.95	679.44
5	-34.864713	149.778664	678.31	1.95	680.26
6	-34.864418	149.778643	677.80	1.95	679.75
7	-34.864425	149.778731	678.62	1.95	680.57
8	-34.865039	149.778767	680.03	1.95	681.98
9	-34.865042	149.778650	678.66	1.95	680.61
10	-34.865319	149.778669	678.68	1.95	680.63
11	-34.865292	149.778386	675.36	1.95	677.31
12	-34.865894	149.778403	674.05	1.95	676.00
13	-34.865903	149.778250	672.04	1.95	673.99
14	-34.866181	149.778256	670.94	1.95	672.89
15	-34.866158	149.778006	667.76	1.95	669.71
16	-34.865242	149.777983	670.58	1.95	672.53
17	-34.865254	149.778092	671.86	1.95	673.81
18	-34.864955	149.778101	672.70	1.95	674.65
19	-34.864652	149.778112	673.44	1.95	675.39

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.861793	149.789000	688.70	1.95	690.65
2	-34.862401	149.793651	693.05	1.95	695.00
3	-34.862093	149.793694	691.55	1.95	693.50
4	-34.861472	149.793673	688.72	1.95	690.67
5	-34.861217	149.791758	688.32	1.95	690.27
6	-34.860601	149.791725	686.00	1.95	687.95
7	-34.860556	149.791328	687.34	1.95	689.29
8	-34.860266	149.791334	687.14	1.95	689.09
9	-34.860143	149.790352	686.29	1.95	688.24
10	-34.859460	149.790336	683.76	1.95	685.71
11	-34.859302	149.789038	683.43	1.95	685.38
12	-34.859945	149.788957	684.94	1.95	686.89

Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853669	149.787596	691.34	1.95	693.29
2	-34.854597	149.787623	689.26	1.95	691.21
3	-34.854562	149.787377	687.65	1.95	689.60
4	-34.853644	149.787352	689.28	1.95	691.23

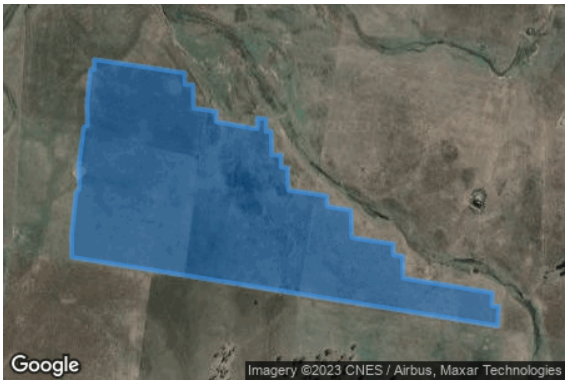
Name: PV array 5
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854681	149.788294	689.54	1.95	691.49
2	-34.854657	149.788044	689.39	1.95	691.34
3	-34.854036	149.788026	692.11	1.95	694.06
4	-34.854010	149.787787	691.97	1.95	693.92
5	-34.853389	149.787776	691.87	1.95	693.82
6	-34.853464	149.788267	693.88	1.95	695.83

Name: PV array 6
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

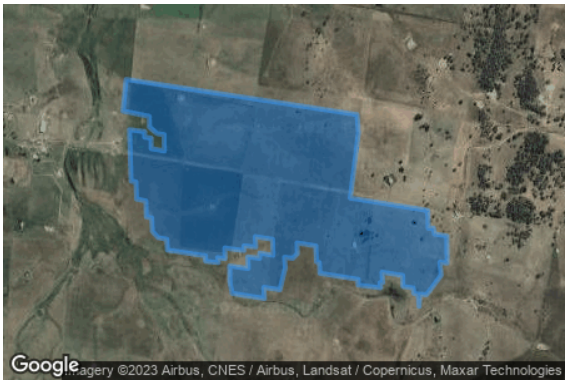
Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853629	149.789463	692.51	1.95	694.46
2	-34.854545	149.789498	688.36	1.95	690.31
3	-34.854551	149.789619	688.95	1.95	690.90
4	-34.855170	149.789627	687.82	1.95	689.77
5	-34.855020	149.788506	686.04	1.95	687.99
6	-34.854078	149.788476	691.03	1.95	692.98
7	-34.854096	149.788651	689.99	1.95	691.94
8	-34.853515	149.788637	692.65	1.95	694.60

Name: PV array 7
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858389	149.762044	654.78	1.95	656.73
2	-34.858763	149.765150	654.46	1.95	656.41
3	-34.859087	149.765169	655.94	1.95	657.89
4	-34.859107	149.765445	655.09	1.95	657.04
5	-34.859756	149.765464	657.08	1.95	659.03
6	-34.859846	149.766237	655.17	1.95	657.12
7	-34.860139	149.766237	655.26	1.95	657.21
8	-34.860337	149.767642	653.16	1.95	655.11
9	-34.860035	149.767650	652.68	1.95	654.63
10	-34.860060	149.767953	652.64	1.95	654.59
11	-34.860414	149.767951	653.24	1.95	655.19
12	-34.860401	149.768125	653.19	1.95	655.14
13	-34.861070	149.768155	654.66	1.95	656.61
14	-34.861072	149.768471	654.35	1.95	656.30
15	-34.861415	149.768471	655.30	1.95	657.25
16	-34.861426	149.768686	655.44	1.95	657.39
17	-34.862054	149.768715	656.53	1.95	658.48
18	-34.862219	149.770037	655.98	1.95	657.93
19	-34.862518	149.770054	657.26	1.95	659.21
20	-34.862624	149.770872	660.29	1.95	662.24
21	-34.863389	149.770896	664.47	1.95	666.42
22	-34.863570	149.772327	662.49	1.95	664.44
23	-34.863872	149.772327	664.38	1.95	666.33
24	-34.863916	149.772649	663.73	1.95	665.68
25	-34.864530	149.772662	667.21	1.95	669.16
26	-34.864941	149.775730	660.60	1.95	662.55
27	-34.865307	149.775709	661.69	1.95	663.64
28	-34.865324	149.775948	661.21	1.95	663.16
29	-34.865877	149.775910	664.14	1.95	666.09
30	-34.863949	149.761276	660.39	1.95	662.34
31	-34.863321	149.761262	658.42	1.95	660.37
32	-34.862142	149.761421	654.55	1.95	656.50
33	-34.862025	149.761536	654.61	1.95	656.56
34	-34.861411	149.761501	654.38	1.95	656.33
35	-34.860282	149.761686	655.50	1.95	657.45
36	-34.860234	149.761807	655.78	1.95	657.73
37	-34.859571	149.761793	654.80	1.95	656.75
38	-34.858667	149.761920	654.60	1.95	656.55
39	-34.858675	149.762038	654.78	1.95	656.73

Name: PV array 8
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.845411	149.763747	652.46	1.95	654.41
2	-34.847392	149.779619	707.21	1.95	709.16
3	-34.848408	149.779711	704.09	1.95	706.04
4	-34.852081	149.779147	685.99	1.95	687.94
5	-34.852786	149.784478	691.16	1.95	693.11
6	-34.853775	149.784508	691.71	1.95	693.66
7	-34.853775	149.784878	689.84	1.95	691.79
8	-34.854100	149.784925	690.53	1.95	692.48
9	-34.854219	149.785789	685.62	1.95	687.57
10	-34.855742	149.785800	682.29	1.95	684.24
11	-34.855683	149.785310	685.04	1.95	686.99
12	-34.856422	149.785389	681.50	1.95	683.45
13	-34.857511	149.784392	682.41	1.95	684.36
14	-34.857481	149.783917	687.18	1.95	689.13
15	-34.858167	149.783881	680.46	1.95	682.41
16	-34.857481	149.783808	688.31	1.95	690.26
17	-34.857436	149.783517	691.61	1.95	693.56
18	-34.857131	149.783481	694.73	1.95	696.68
19	-34.857050	149.782769	697.28	1.95	699.23
20	-34.856428	149.782753	702.34	1.95	704.29
21	-34.856247	149.781331	690.38	1.95	692.33
22	-34.856842	149.781372	686.61	1.95	688.56
23	-34.856842	149.781181	684.12	1.95	686.07
24	-34.857128	149.781225	681.30	1.95	683.25
25	-34.856967	149.779683	671.16	1.95	673.11
26	-34.856650	149.779697	671.81	1.95	673.76
27	-34.856311	149.777061	674.88	1.95	676.83
28	-34.855703	149.777025	677.46	1.95	679.41
29	-34.855667	149.776828	677.06	1.95	679.01
30	-34.854769	149.776781	677.81	1.95	679.76
31	-34.854597	149.775486	674.67	1.95	676.62
32	-34.855203	149.775514	675.51	1.95	677.46
33	-34.855472	149.775192	675.81	1.95	677.76
34	-34.855406	149.774631	673.87	1.95	675.82
35	-34.856003	149.774686	674.26	1.95	676.21
36	-34.857236	149.774311	667.81	1.95	669.76
37	-34.857097	149.773200	666.06	1.95	668.01
38	-34.857725	149.773250	663.66	1.95	665.61
39	-34.857439	149.771031	657.32	1.95	659.27
40	-34.856844	149.770881	658.78	1.95	660.73
41	-34.855897	149.770853	661.80	1.95	663.75
42	-34.856044	149.772136	665.70	1.95	667.65
43	-34.855386	149.772106	666.67	1.95	668.62
44	-34.855475	149.772917	667.66	1.95	669.61
45	-34.855178	149.772928	667.97	1.95	669.92
46	-34.855297	149.773847	670.37	1.95	672.32
47	-34.854400	149.773822	667.85	1.95	669.80
48	-34.854247	149.772617	670.96	1.95	672.91
49	-34.854831	149.772658	668.72	1.95	670.67
50	-34.854761	149.771839	667.26	1.95	669.21
51	-34.855033	149.771839	666.77	1.95	668.72
52	-34.854889	149.770528	663.03	1.95	664.98
53	-34.855489	149.770544	662.17	1.95	664.12
54	-34.855433	149.770022	661.56	1.95	663.51
55	-34.855714	149.770078	660.72	1.95	662.67
56	-34.855625	149.769203	659.64	1.95	661.59
57	-34.855331	149.769208	660.52	1.95	662.47
58	-34.855006	149.766578	654.49	1.95	656.44
59	-34.854394	149.766550	657.29	1.95	659.24

Name: PV array 9
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 0.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840718	149.772712	672.26	1.95	674.21
2	-34.840814	149.773442	671.97	1.95	673.92
3	-34.841456	149.773456	675.07	1.95	677.02
4	-34.841747	149.773419	676.57	1.95	678.52
5	-34.841731	149.773314	676.64	1.95	678.59
6	-34.842339	149.773342	678.44	1.95	680.39
7	-34.842631	149.773217	678.20	1.95	680.15
8	-34.842756	149.773061	677.22	1.95	679.17
9	-34.843378	149.773086	674.65	1.95	676.60
10	-34.843647	149.773042	673.22	1.95	675.17
11	-34.843625	149.772867	672.64	1.95	674.59
12	-34.844278	149.772897	670.46	1.95	672.41
13	-34.844536	149.772847	669.57	1.95	671.52
14	-34.844522	149.772678	668.82	1.95	670.77
15	-34.845225	149.772706	668.61	1.95	670.56
16	-34.845481	149.772669	668.60	1.95	670.55
17	-34.845486	149.772600	668.15	1.95	670.10
18	-34.846100	149.772636	668.91	1.95	670.86
19	-34.846103	149.772514	668.39	1.95	670.34
20	-34.846381	149.772536	668.80	1.95	670.75
21	-34.845264	149.763456	651.54	1.95	653.49
22	-34.844958	149.763439	651.17	1.95	653.12
23	-34.844922	149.763219	650.29	1.95	652.24
24	-34.843692	149.763178	648.91	1.95	650.86
25	-34.844175	149.766897	654.86	1.95	656.81
26	-34.844772	149.766933	655.27	1.95	657.22
27	-34.845303	149.771283	663.76	1.95	665.71
28	-34.844328	149.771242	664.76	1.95	666.71
29	-34.843819	149.767178	655.00	1.95	656.95
30	-34.843528	149.767169	655.11	1.95	657.06
31	-34.843097	149.763747	648.51	1.95	650.46
32	-34.842475	149.763756	648.01	1.95	649.96
33	-34.842494	149.764075	648.08	1.95	650.03
34	-34.841894	149.764058	648.00	1.95	649.95
35	-34.841903	149.764161	648.00	1.95	649.95
36	-34.841614	149.764144	647.51	1.95	649.46
37	-34.841956	149.767048	654.66	1.95	656.61
38	-34.840915	149.767103	652.33	1.95	654.28
39	-34.840928	149.767232	652.75	1.95	654.70
40	-34.840081	149.767326	653.68	1.95	655.63
41	-34.840302	149.769306	665.37	1.95	667.32
42	-34.840380	149.769919	668.21	1.95	670.16
43	-34.840484	149.770793	669.07	1.95	671.02
44	-34.840569	149.771476	669.92	1.95	671.87

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-34.877248	149.733392	676.66	1.50
OP 2	2	-34.877736	149.736530	672.74	1.50
OP 3	3	-34.816270	149.774945	687.63	1.50
OP 4	4	-34.832221	149.795595	702.10	1.50
OP 5	5	-34.823917	149.794925	718.02	1.50
OP 6	6	-34.840652	149.799444	693.75	1.50
OP 7	7	-34.843100	149.800098	697.95	1.50
OP 8	8	-34.851934	149.795258	724.54	1.50
OP 9	9	-34.849279	149.798495	704.99	1.50
OP 10	10	-34.869064	149.811292	736.59	1.50
OP 11	11	-34.819425	149.738225	650.78	1.50
OP 12	12	-34.852672	149.736507	690.02	1.50
OP 13	13	-34.832789	149.743150	678.73	1.50
OP 14	14	-34.846924	149.730615	690.46	1.50
OP 15	15	-34.839542	149.807660	737.64	1.50
OP 16	16	-34.806698	149.734245	636.07	1.50
OP 17	17	-34.807504	149.733532	638.67	1.50

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
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 10	SA tracking	SA tracking	2,079	34.6	0	0.0	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	210	3.5	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	95	1.6	0	0.0	-
PV array 4	SA tracking	SA tracking	404	6.7	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	630	10.5	0	0.0	-
PV array 7	SA tracking	SA tracking	1,785	29.8	220	3.7	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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
OP 1	389	6.5	0	0.0
OP 2	400	6.7	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	101	1.7	0	0.0
OP 7	225	3.8	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 8	1,541	25.7	0	0.0
OP 9	811	13.5	0	0.0
OP 10	51	0.8	0	0.0
OP 11	0	0.0	0	0.0
OP 12	756	12.6	220	3.7
OP 13	0	0.0	0	0.0
OP 14	713	11.9	0	0.0
OP 15	216	3.6	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV: PV array 1 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 1 and OP 1

No glare found

PV array 1 and OP 2

No glare found

PV array 1 and OP 3

No glare found

PV array 1 and OP 4

No glare found

PV array 1 and OP 5

No glare found

PV array 1 and OP 6

No glare found

PV array 1 and OP 7

No glare found

PV array 1 and OP 8

No glare found

PV array 1 and OP 9

No glare found

PV array 1 and OP 10

No glare found

PV array 1 and OP 11

No glare found

PV array 1 and OP 12

No glare found

PV array 1 and OP 13

No glare found

PV array 1 and OP 14

No glare found

PV array 1 and OP 15

No glare found

PV array 1 and OP 16

No glare found

PV array 1 and OP 17

No glare found

PV: PV array 10 low potential for temporary after-image

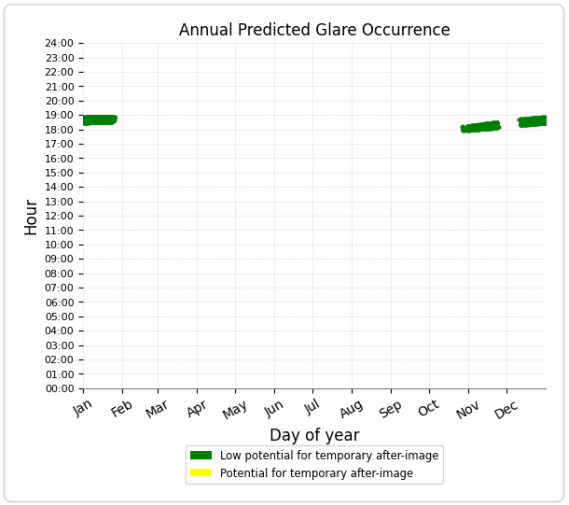
Receptor results ordered by category of glare

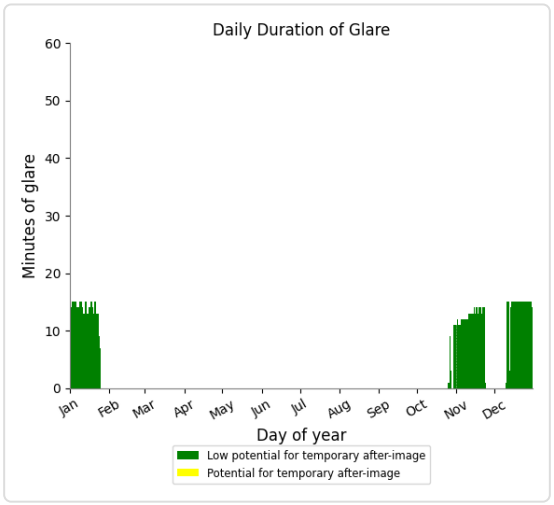
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 8	973	16.2	0	0.0
OP 9	619	10.3	0	0.0
OP 12	348	5.8	0	0.0
OP 14	139	2.3	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

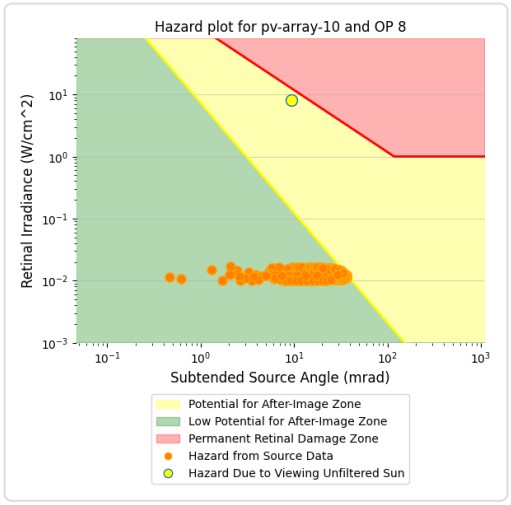
PV array 10 and OP 8

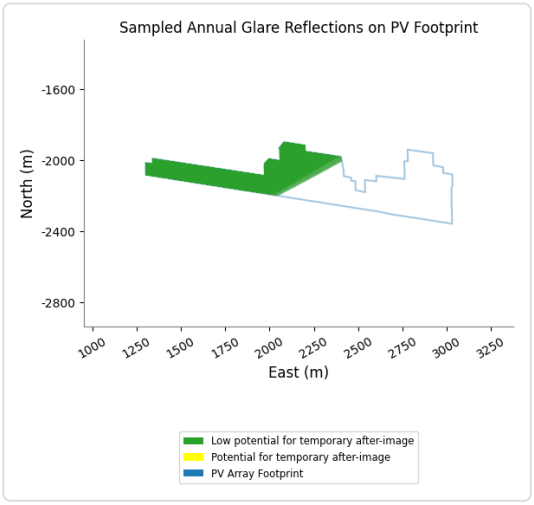
Yellow glare: none

Green glare: 973 min.





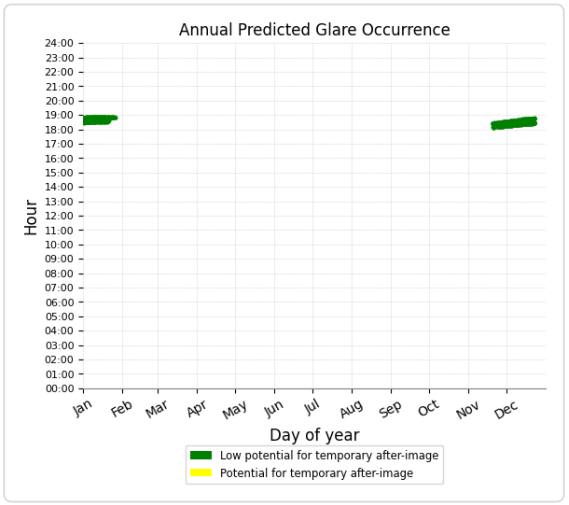


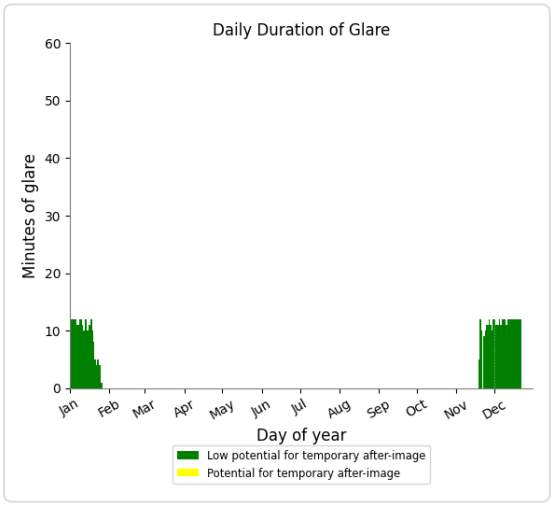


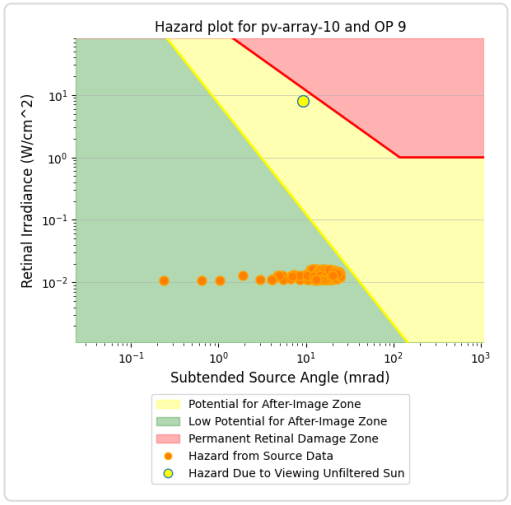
PV array 10 and OP 9

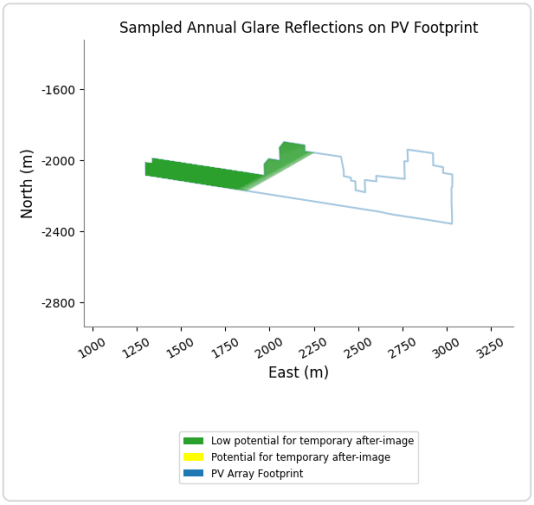
Yellow glare: none

Green glare: 619 min.





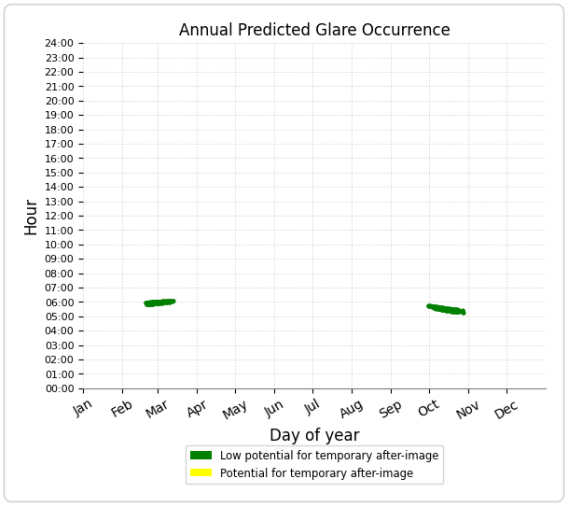


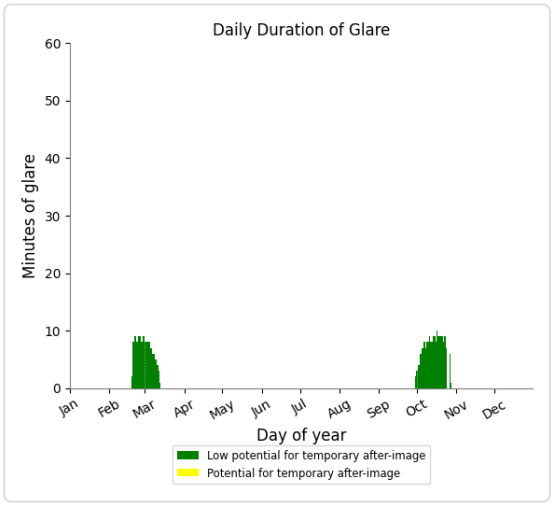


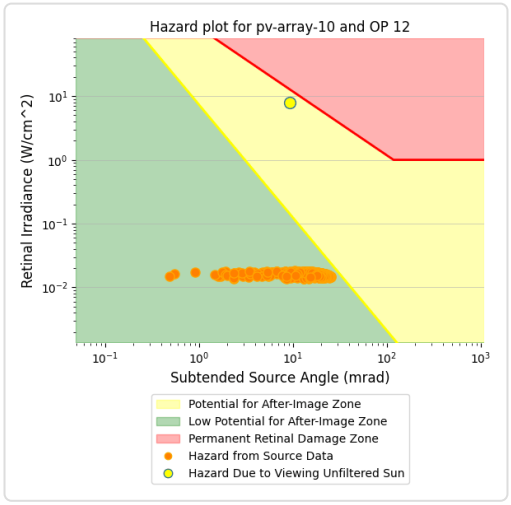
PV array 10 and OP 12

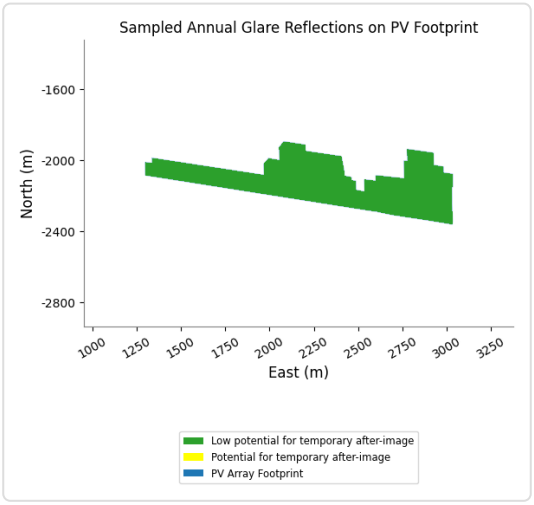
Yellow glare: none

Green glare: 348 min.





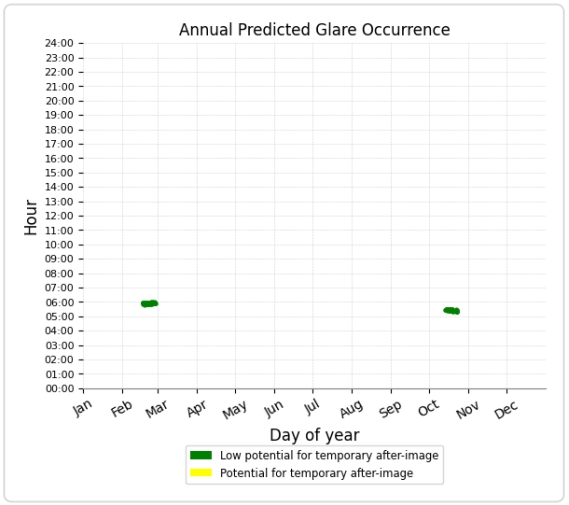


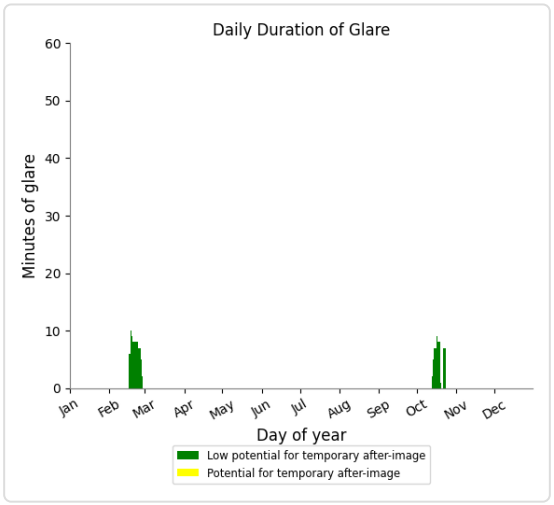


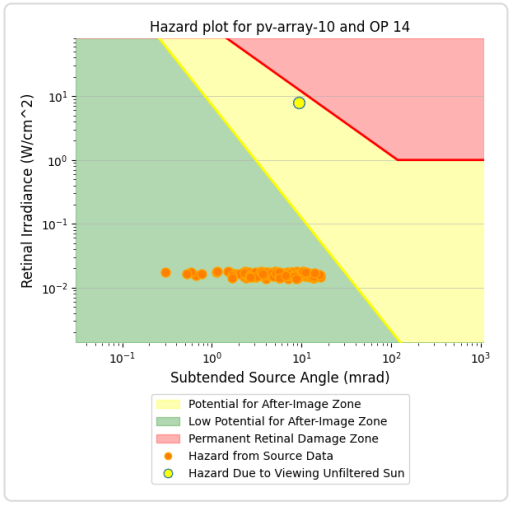
PV array 10 and OP 14

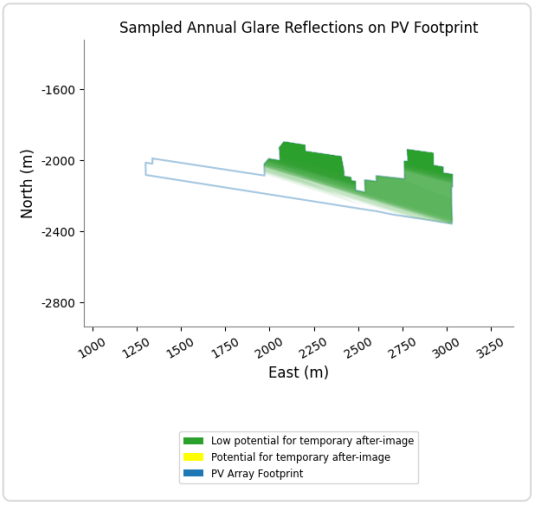
Yellow glare: none

Green glare: 139 min.









PV array 10 and OP 1

No glare found

PV array 10 and OP 2

No glare found

PV array 10 and OP 3

No glare found

PV array 10 and OP 4

No glare found

PV array 10 and OP 5

No glare found

PV array 10 and OP 6

No glare found

PV array 10 and OP 7

No glare found

PV array 10 and OP 10

No glare found

PV array 10 and OP 11

No glare found

PV array 10 and OP 13

No glare found

PV array 10 and OP 15

No glare found

PV array 10 and OP 16

No glare found

PV array 10 and OP 17

No glare found

PV: PV array 11 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 11 and OP 1

No glare found

PV array 11 and OP 2

No glare found

PV array 11 and OP 3

No glare found

PV array 11 and OP 4

No glare found

PV array 11 and OP 5

No glare found

PV array 11 and OP 6

No glare found

PV array 11 and OP 7

No glare found

PV array 11 and OP 8

No glare found

PV array 11 and OP 9

No glare found

PV array 11 and OP 10

No glare found

PV array 11 and OP 11

No glare found

PV array 11 and OP 12

No glare found

PV array 11 and OP 13

No glare found

PV array 11 and OP 14

No glare found

PV array 11 and OP 15

No glare found

PV array 11 and OP 16

No glare found

PV array 11 and OP 17

No glare found

PV: PV array 12 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 12 and OP 1

No glare found

PV array 12 and OP 2

No glare found

PV array 12 and OP 3

No glare found

PV array 12 and OP 4

No glare found

PV array 12 and OP 5

No glare found

PV array 12 and OP 6

No glare found

PV array 12 and OP 7

No glare found

PV array 12 and OP 8

No glare found

PV array 12 and OP 9

No glare found

PV array 12 and OP 10

No glare found

PV array 12 and OP 11

No glare found

PV array 12 and OP 12

No glare found

PV array 12 and OP 13

No glare found

PV array 12 and OP 14

No glare found

PV array 12 and OP 15

No glare found

PV array 12 and OP 16

No glare found

PV array 12 and OP 17

No glare found

PV: PV array 13 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 13 and OP 1

No glare found

PV array 13 and OP 2

No glare found

PV array 13 and OP 3

No glare found

PV array 13 and OP 4

No glare found

PV array 13 and OP 5

No glare found

PV array 13 and OP 6

No glare found

PV array 13 and OP 7

No glare found

PV array 13 and OP 8

No glare found

PV array 13 and OP 9

No glare found

PV array 13 and OP 10

No glare found

PV array 13 and OP 11

No glare found

PV array 13 and OP 12

No glare found

PV array 13 and OP 13

No glare found

PV array 13 and OP 14

No glare found

PV array 13 and OP 15

No glare found

PV array 13 and OP 16

No glare found

PV array 13 and OP 17

No glare found

PV: PV array 14 low potential for temporary after-image

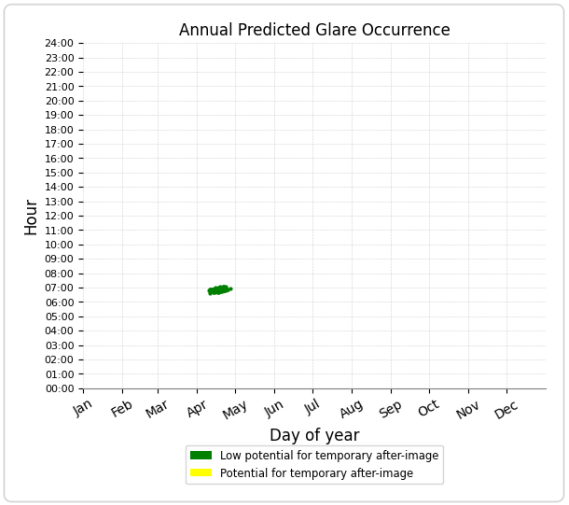
Receptor results ordered by category of glare

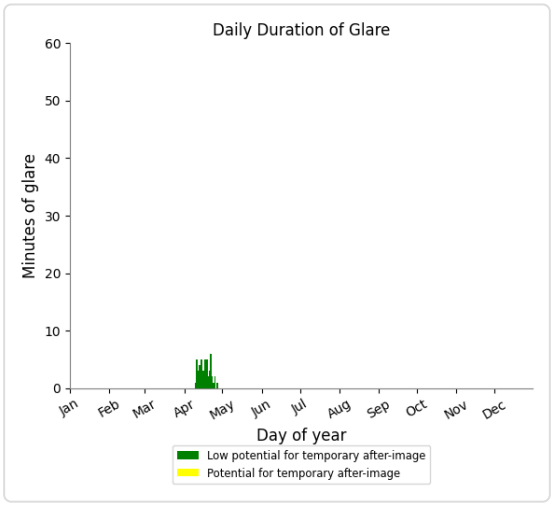
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	58	1.0	0	0.0
OP 2	101	1.7	0	0.0
OP 10	51	0.8	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

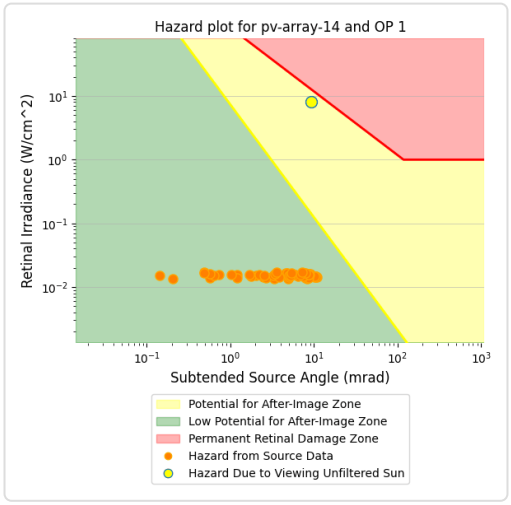
PV array 14 and OP 1

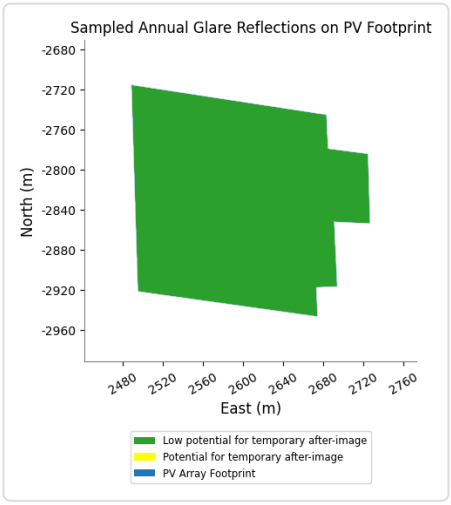
Yellow glare: none

Green glare: 58 min.





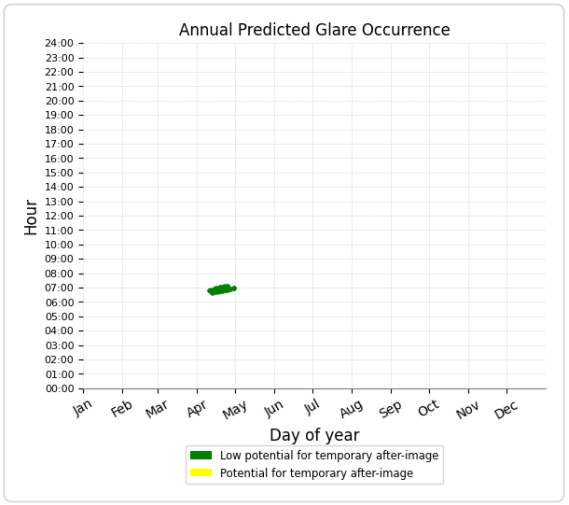


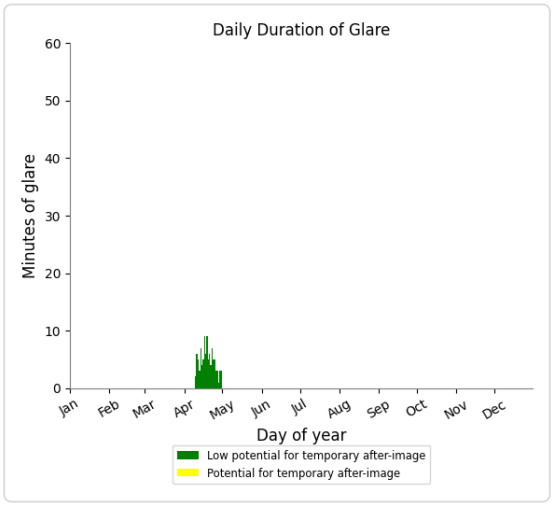


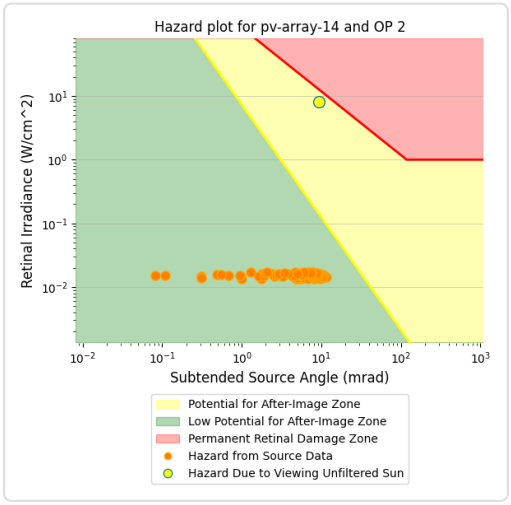
PV array 14 and OP 2

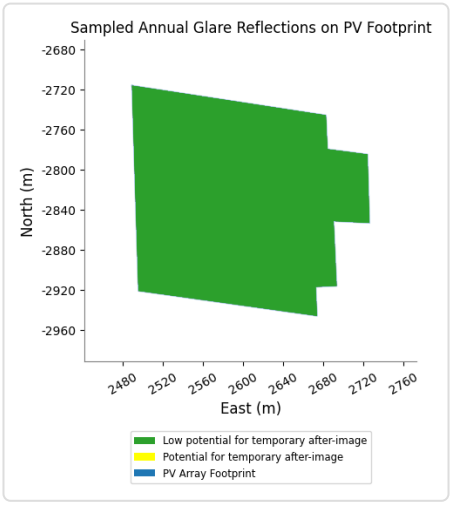
Yellow glare: none

Green glare: 101 min.





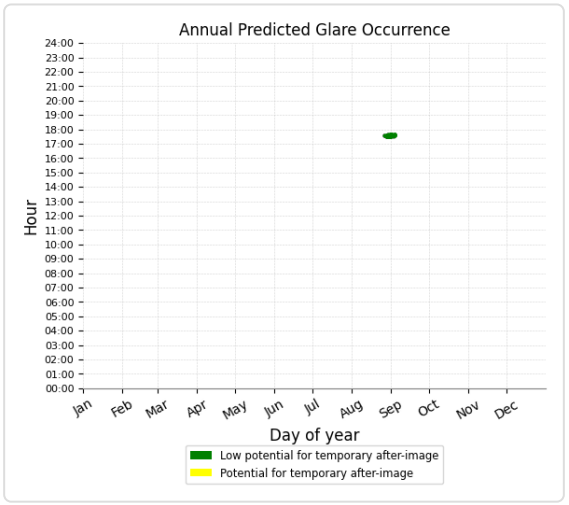


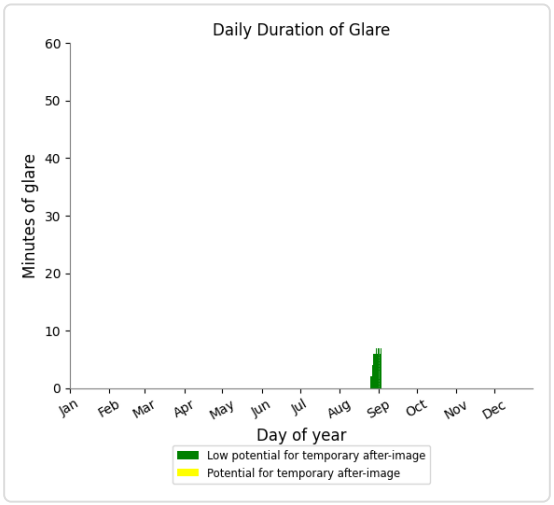


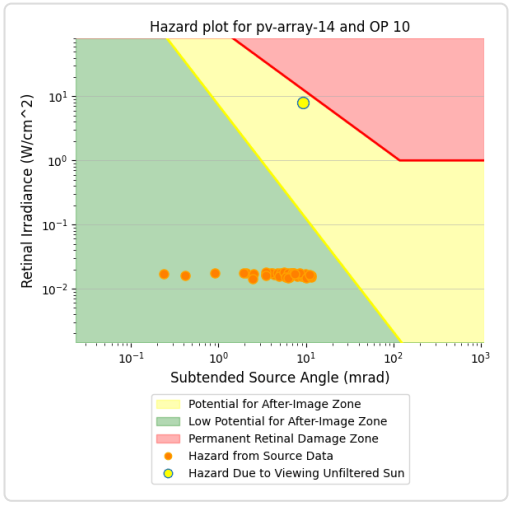
PV array 14 and OP 10

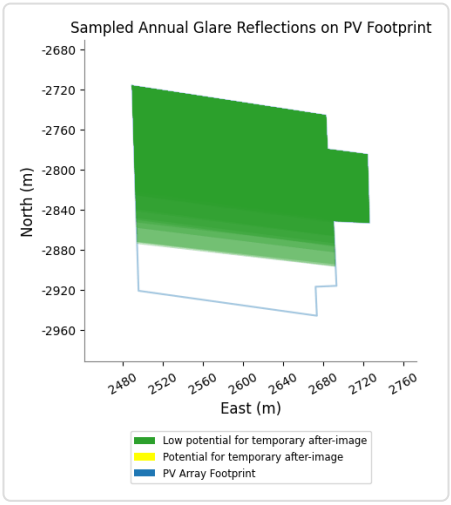
Yellow glare: none

Green glare: 51 min.









PV array 14 and OP 3

No glare found

PV array 14 and OP 4

No glare found

PV array 14 and OP 5

No glare found

PV array 14 and OP 6

No glare found

PV array 14 and OP 7

No glare found

PV array 14 and OP 8

No glare found

PV array 14 and OP 9

No glare found

PV array 14 and OP 11

No glare found

PV array 14 and OP 12

No glare found

PV array 14 and OP 13

No glare found

PV array 14 and OP 14

No glare found

PV array 14 and OP 15

No glare found

PV array 14 and OP 16

No glare found

PV array 14 and OP 17

No glare found

PV: PV array 2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 2 and OP 1

No glare found

PV array 2 and OP 2

No glare found

PV array 2 and OP 3

No glare found

PV array 2 and OP 4

No glare found

PV array 2 and OP 5

No glare found

PV array 2 and OP 6

No glare found

PV array 2 and OP 7

No glare found

PV array 2 and OP 8

No glare found

PV array 2 and OP 9

No glare found

PV array 2 and OP 10

No glare found

PV array 2 and OP 11

No glare found

PV array 2 and OP 12

No glare found

PV array 2 and OP 13

No glare found

PV array 2 and OP 14

No glare found

PV array 2 and OP 15

No glare found

PV array 2 and OP 16

No glare found

PV array 2 and OP 17

No glare found

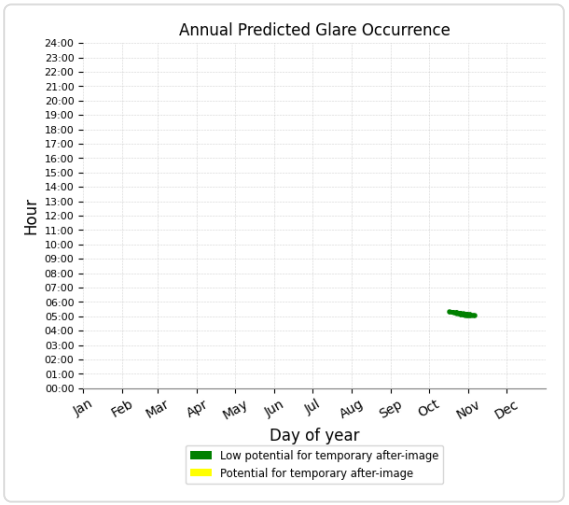
PV: PV array 3 low potential for temporary after-image

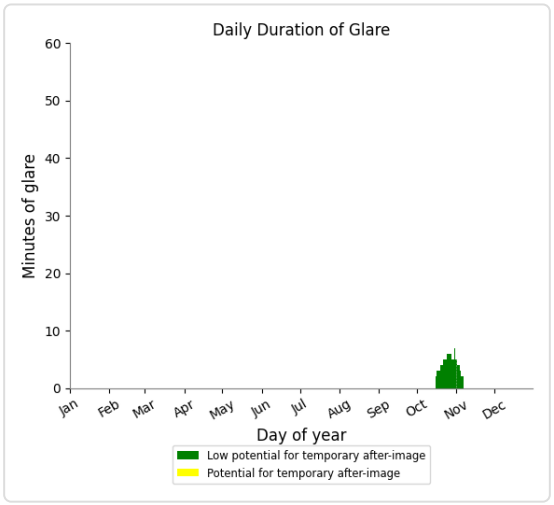
Receptor results ordered by category of glare

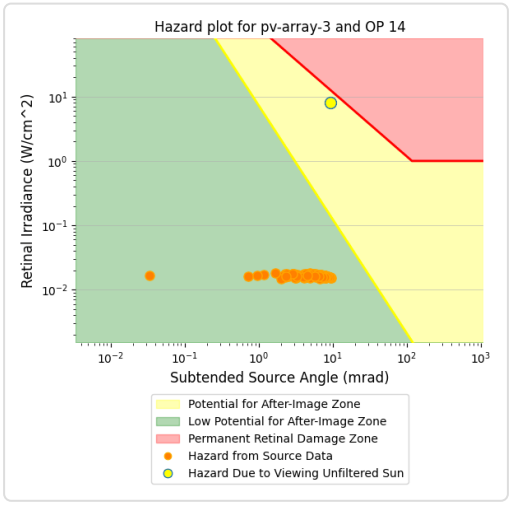
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 14	95	1.6	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

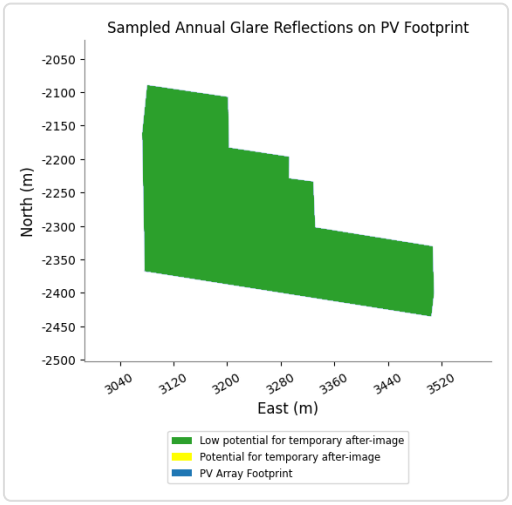
PV array 3 and OP 14

Yellow glare: none
Green glare: 95 min.









PV array 3 and OP 1

No glare found

PV array 3 and OP 2

No glare found

PV array 3 and OP 3

No glare found

PV array 3 and OP 4

No glare found

PV array 3 and OP 5

No glare found

PV array 3 and OP 6

No glare found

PV array 3 and OP 7

No glare found

PV array 3 and OP 8

No glare found

PV array 3 and OP 9

No glare found

PV array 3 and OP 10

No glare found

PV array 3 and OP 11

No glare found

PV array 3 and OP 12

No glare found

PV array 3 and OP 13

No glare found

PV array 3 and OP 15

No glare found

PV array 3 and OP 16

No glare found

PV array 3 and OP 17

No glare found

PV: PV array 4 low potential for temporary after-image

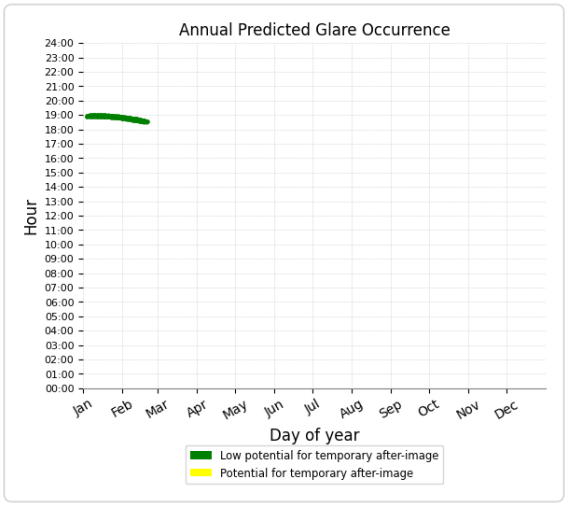
Receptor results ordered by category of glare

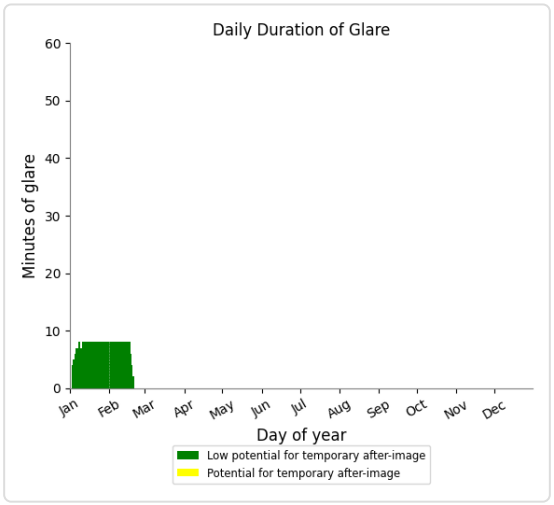
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 8	368	6.1	0	0.0
OP 9	36	0.6	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

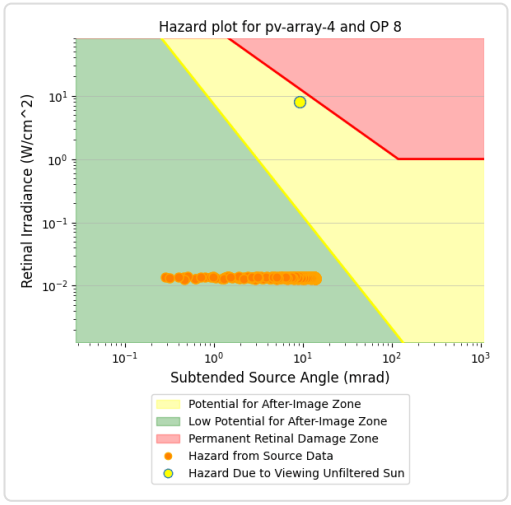
PV array 4 and OP 8

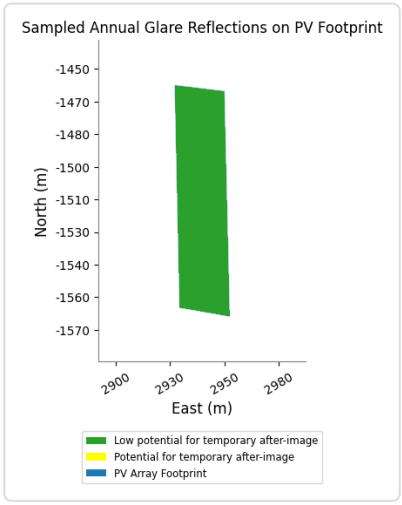
Yellow glare: none

Green glare: 368 min.



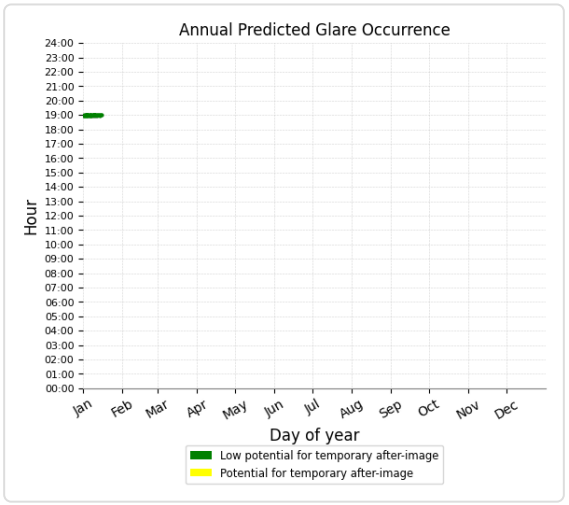


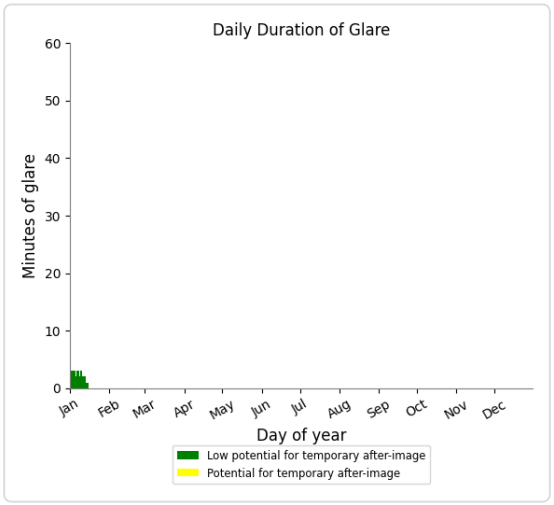


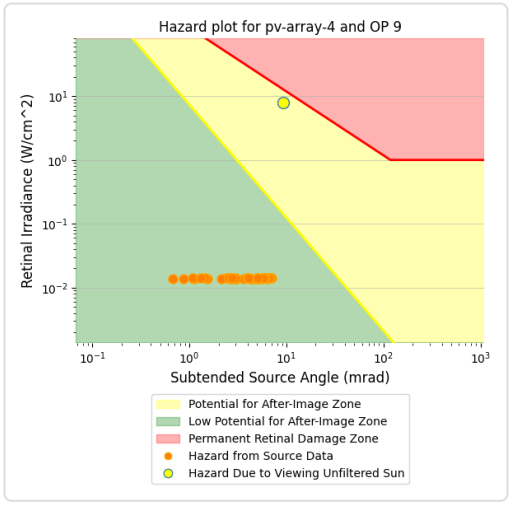


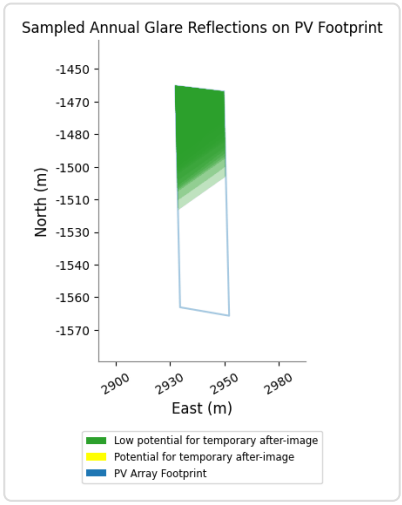
PV array 4 and OP 9

Yellow glare: none
Green glare: 36 min.









PV array 4 and OP 1

No glare found

PV array 4 and OP 2

No glare found

PV array 4 and OP 3

No glare found

PV array 4 and OP 4

No glare found

PV array 4 and OP 5

No glare found

PV array 4 and OP 6

No glare found

PV array 4 and OP 7

No glare found

PV array 4 and OP 10

No glare found

PV array 4 and OP 11

No glare found

PV array 4 and OP 12

No glare found

PV array 4 and OP 13

No glare found

PV array 4 and OP 14

No glare found

PV array 4 and OP 15

No glare found

PV array 4 and OP 16

No glare found

PV array 4 and OP 17

No glare found

PV: PV array 5 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 5 and OP 1

No glare found

PV array 5 and OP 2

No glare found

PV array 5 and OP 3

No glare found

PV array 5 and OP 4

No glare found

PV array 5 and OP 5

No glare found

PV array 5 and OP 6

No glare found

PV array 5 and OP 7

No glare found

PV array 5 and OP 8

No glare found

PV array 5 and OP 9

No glare found

PV array 5 and OP 10

No glare found

PV array 5 and OP 11

No glare found

PV array 5 and OP 12

No glare found

PV array 5 and OP 13

No glare found

PV array 5 and OP 14

No glare found

PV array 5 and OP 15

No glare found

PV array 5 and OP 16

No glare found

PV array 5 and OP 17

No glare found

PV: PV array 6 low potential for temporary after-image

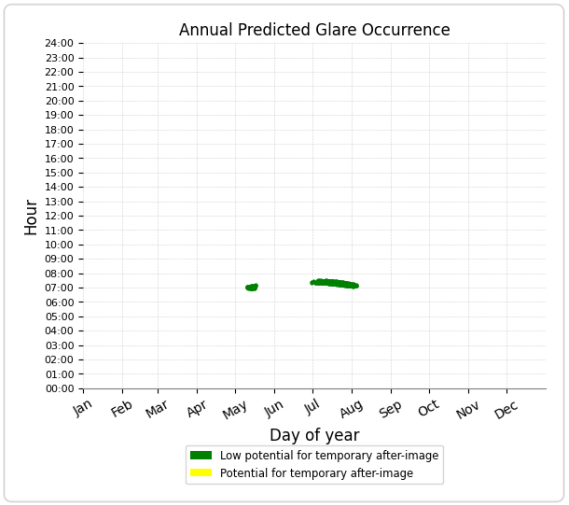
Receptor results ordered by category of glare

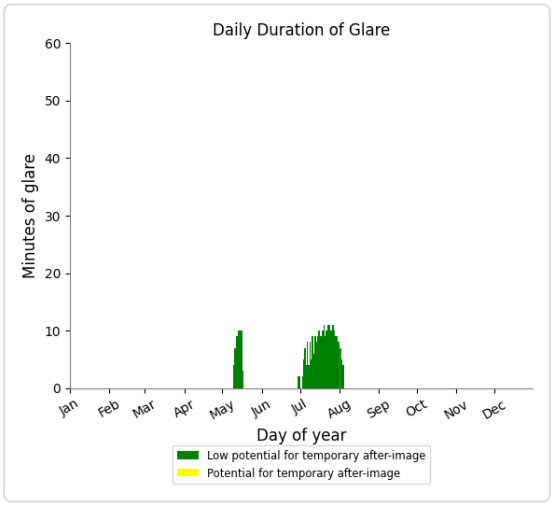
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	331	5.5	0	0.0
OP 2	299	5.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

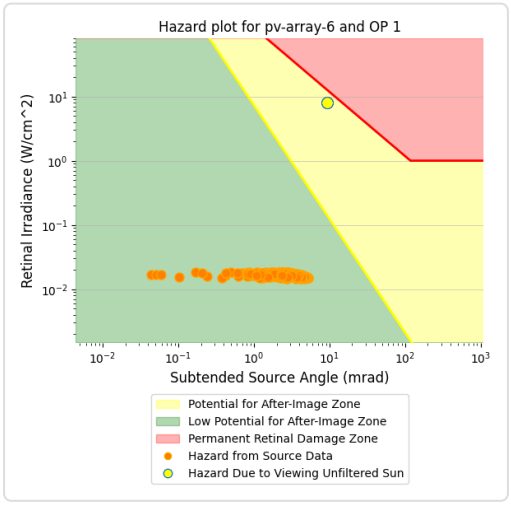
PV array 6 and OP 1

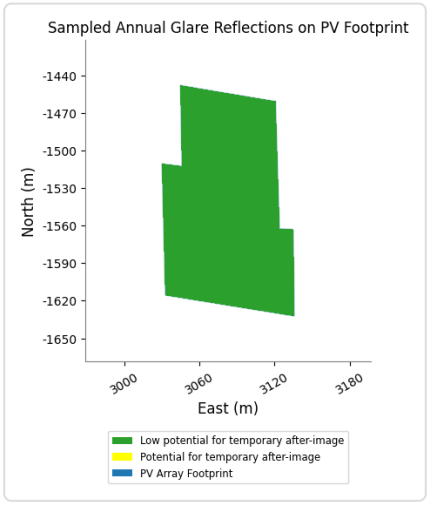
Yellow glare: none

Green glare: 331 min.





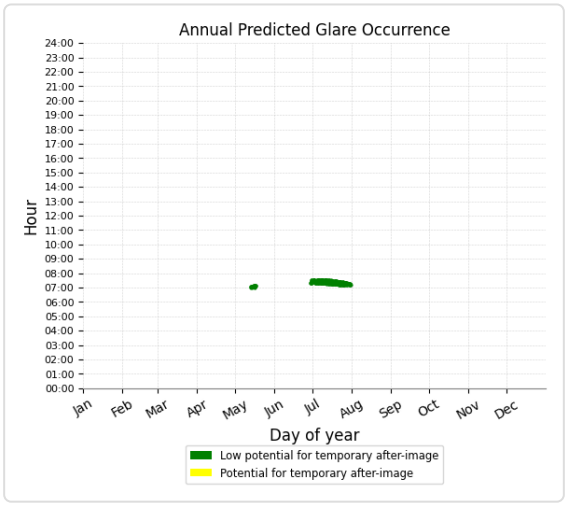


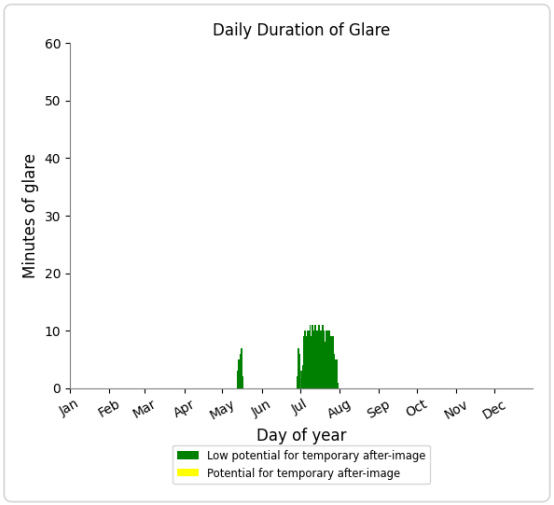


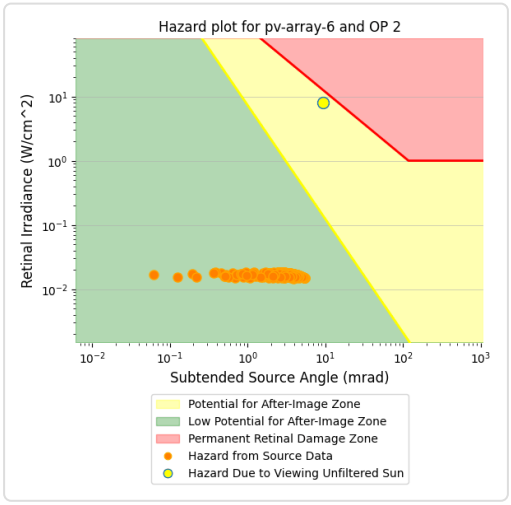
PV array 6 and OP 2

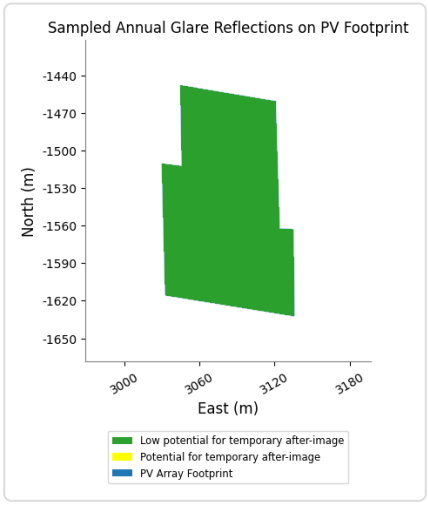
Yellow glare: none

Green glare: 299 min.









PV array 6 and OP 3

No glare found

PV array 6 and OP 4

No glare found

PV array 6 and OP 5

No glare found

PV array 6 and OP 6

No glare found

PV array 6 and OP 7

No glare found

PV array 6 and OP 8

No glare found

PV array 6 and OP 9

No glare found

PV array 6 and OP 10

No glare found

PV array 6 and OP 11

No glare found

PV array 6 and OP 12

No glare found

PV array 6 and OP 13

No glare found

PV array 6 and OP 14

No glare found

PV array 6 and OP 15

No glare found

PV array 6 and OP 16

No glare found

PV array 6 and OP 17

No glare found

PV: PV array 7 potential temporary after-image

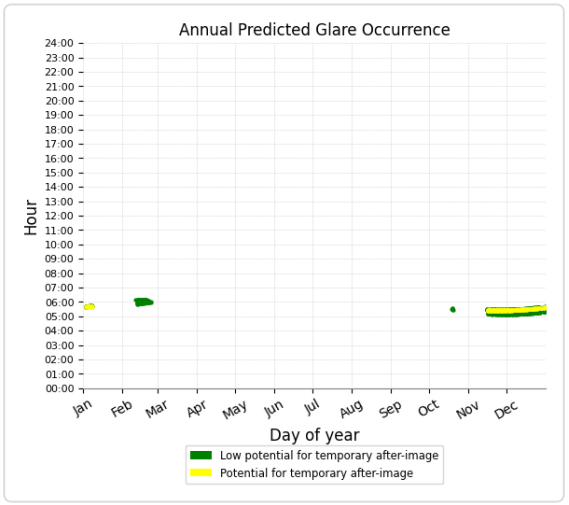
Receptor results ordered by category of glare

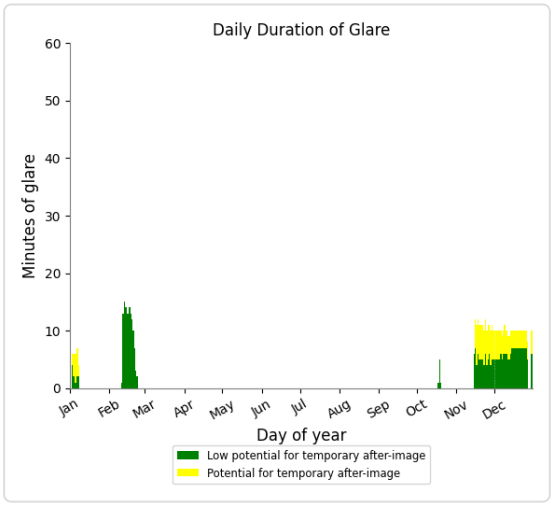
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 12	408	6.8	220	3.7
OP 6	101	1.7	0	0.0
OP 7	225	3.8	0	0.0
OP 8	200	3.3	0	0.0
OP 9	156	2.6	0	0.0
OP 14	479	8.0	0	0.0
OP 15	216	3.6	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

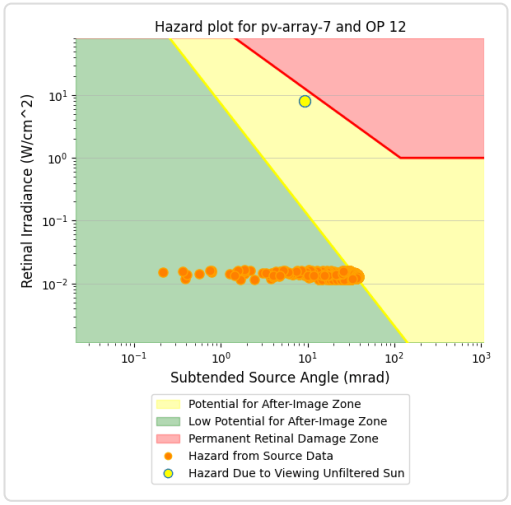
PV array 7 and OP 12

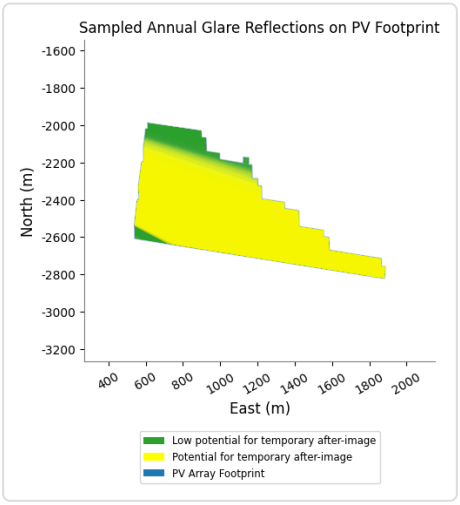
Yellow glare: 220 min.

Green glare: 408 min.





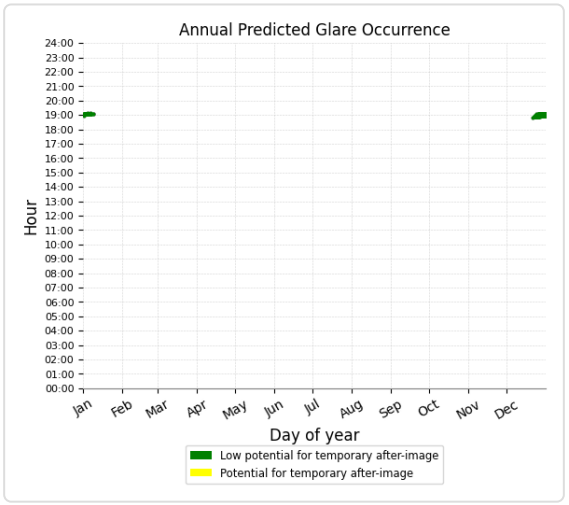


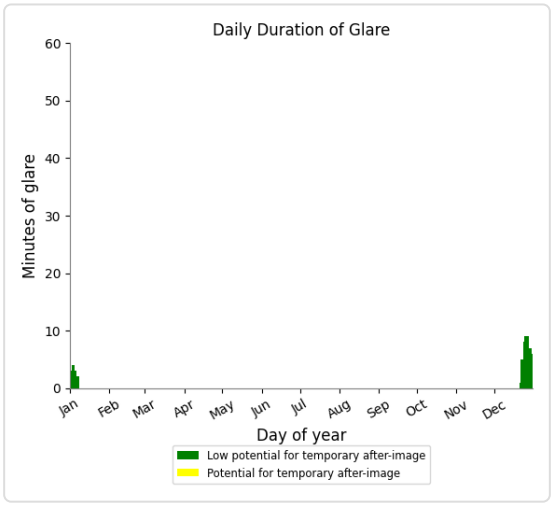


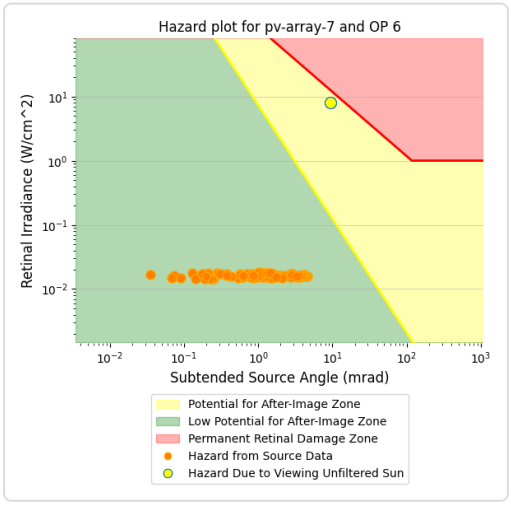
PV array 7 and OP 6

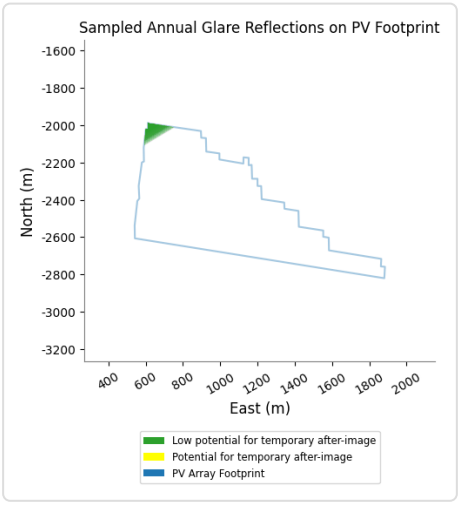
Yellow glare: none

Green glare: 101 min.





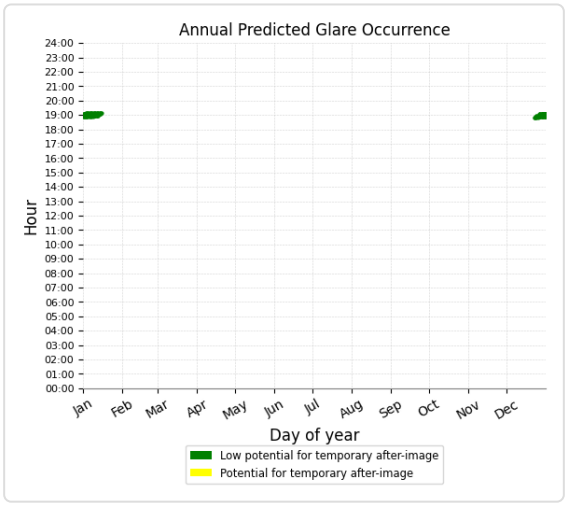


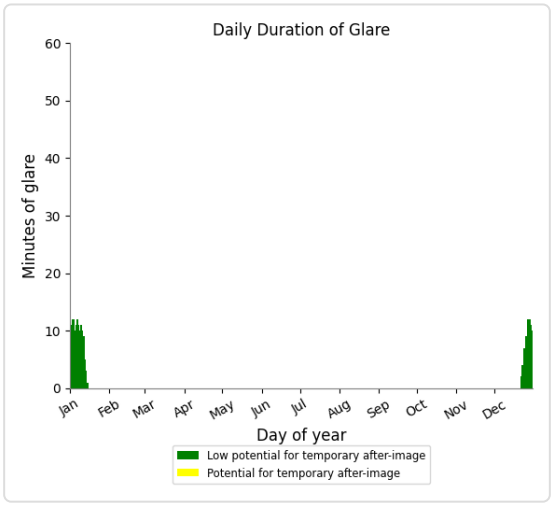


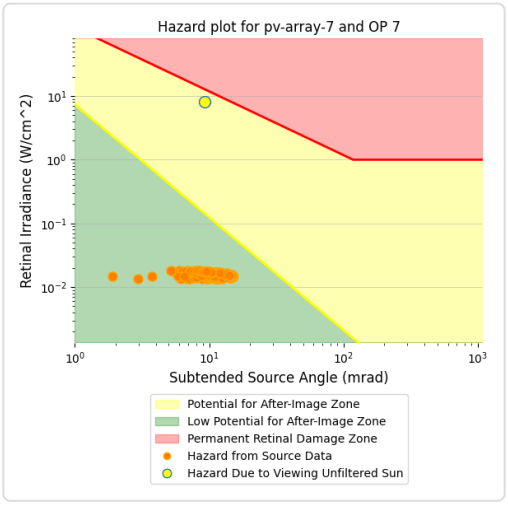
PV array 7 and OP 7

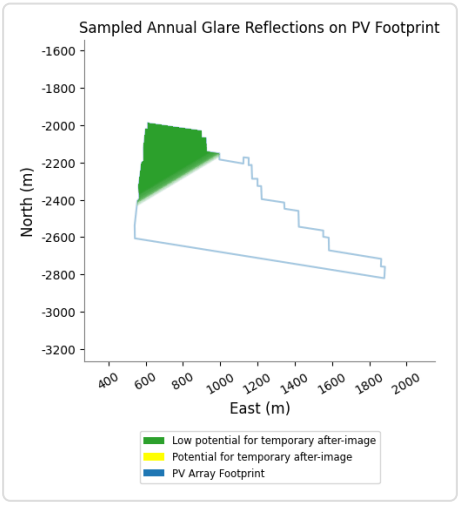
Yellow glare: none

Green glare: 225 min.





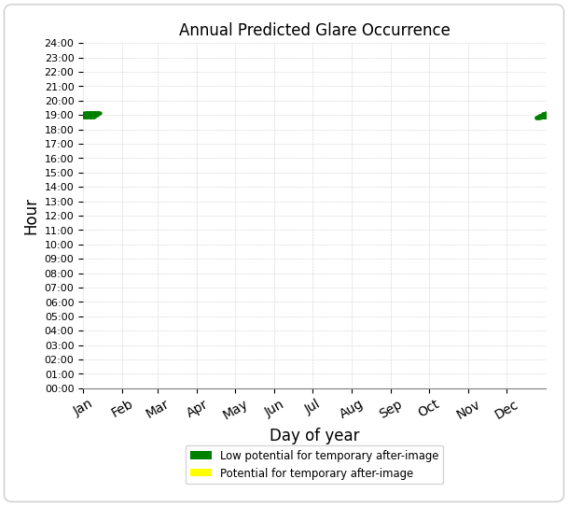


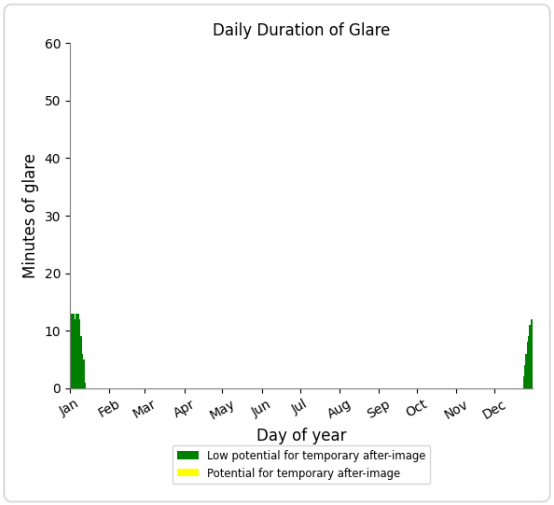


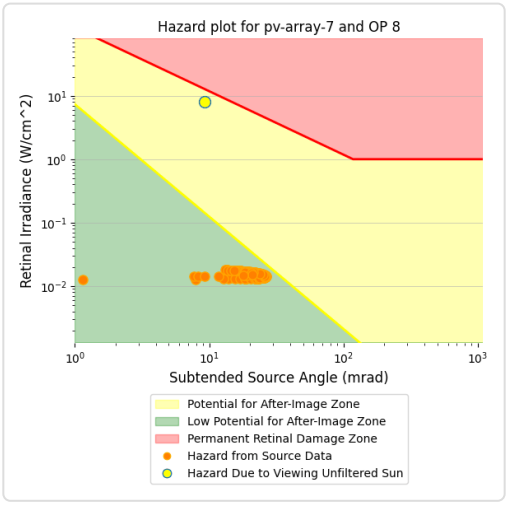
PV array 7 and OP 8

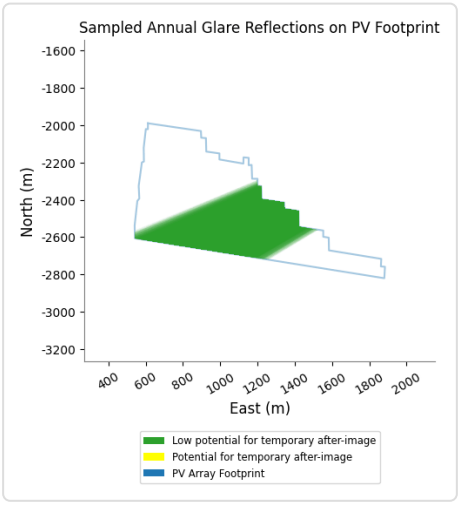
Yellow glare: none

Green glare: 200 min.





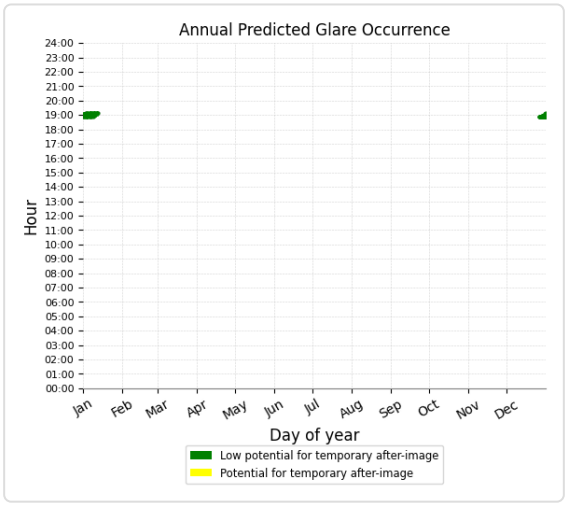


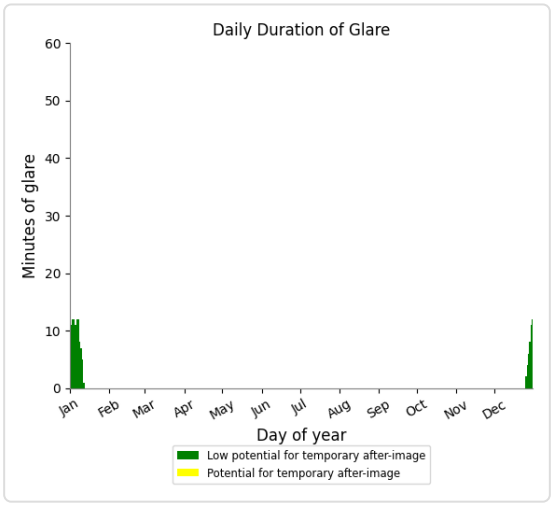


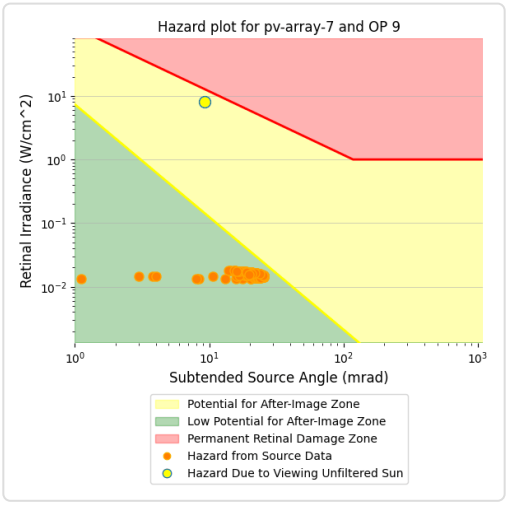
PV array 7 and OP 9

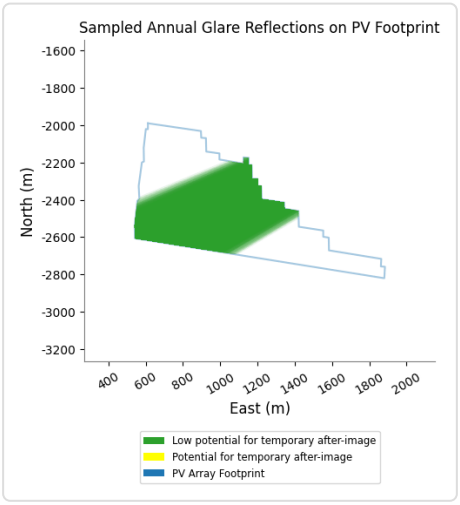
Yellow glare: none

Green glare: 156 min.





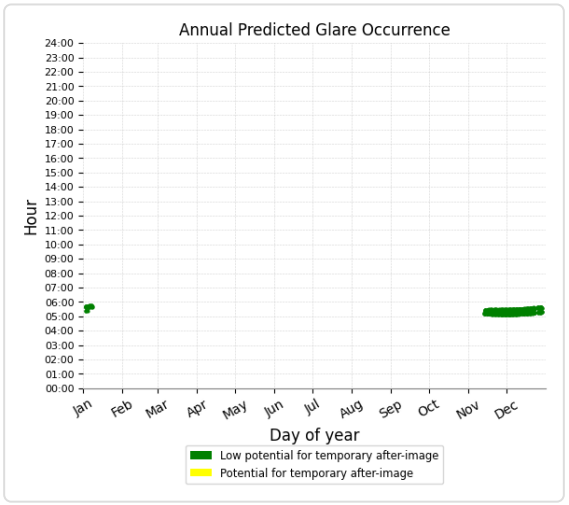


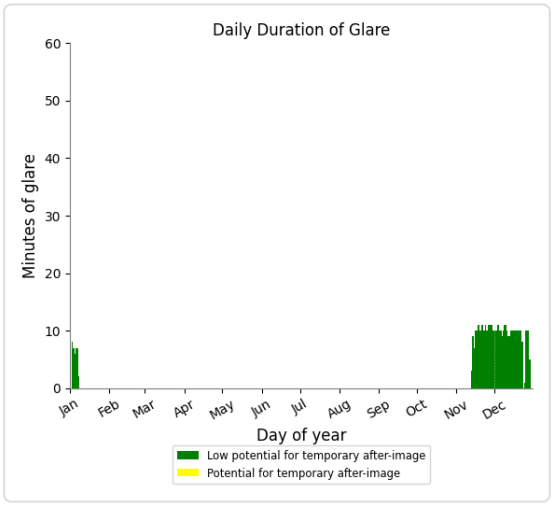


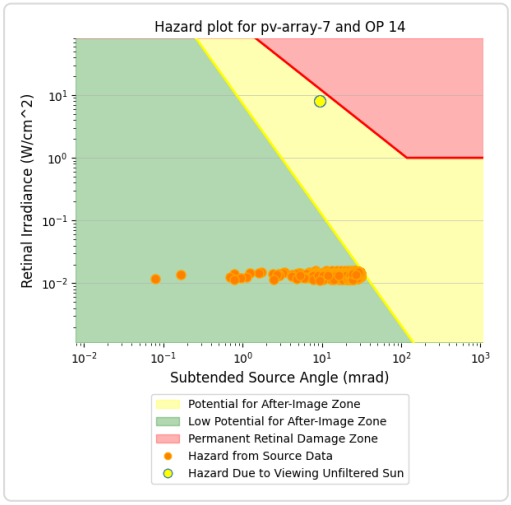
PV array 7 and OP 14

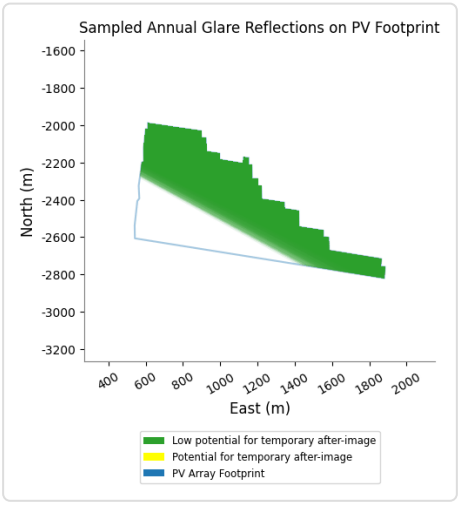
Yellow glare: none

Green glare: 479 min.



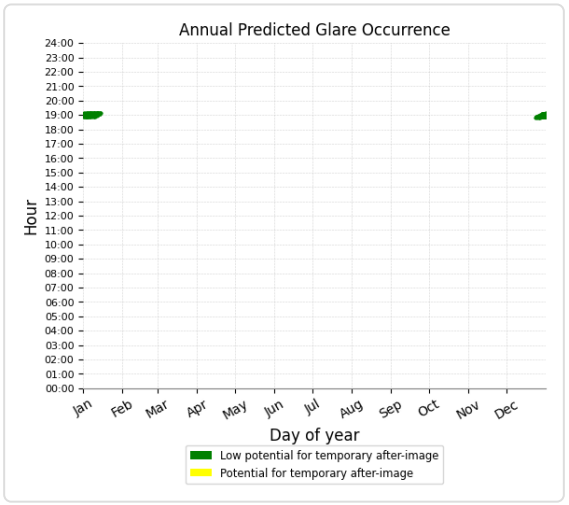


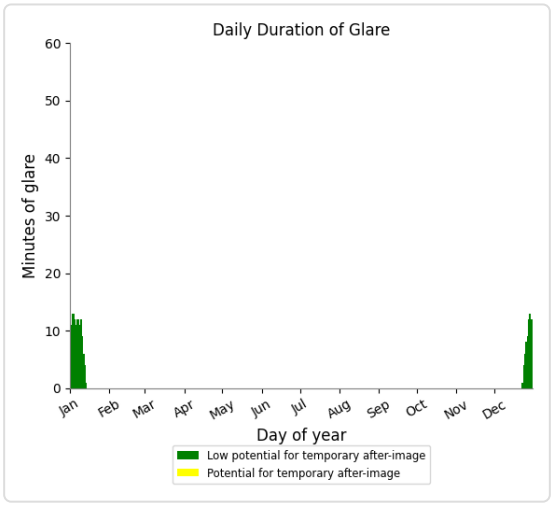


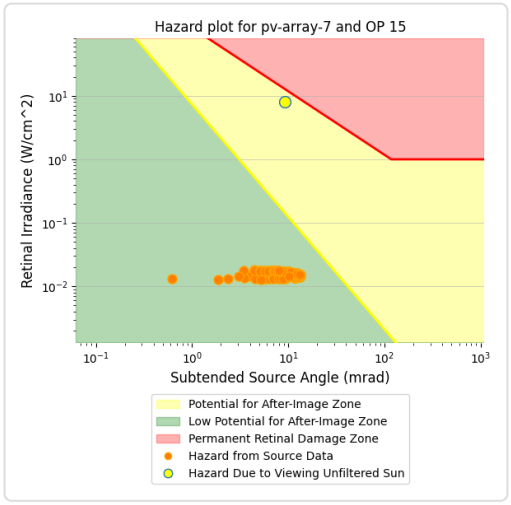


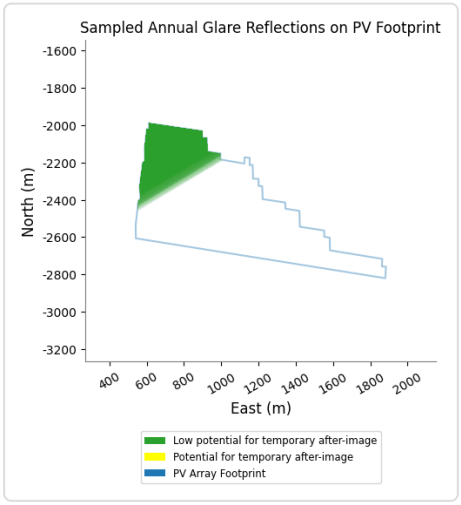
PV array 7 and OP 15

Yellow glare: none
Green glare: 216 min.









PV array 7 and OP 1

No glare found

PV array 7 and OP 2

No glare found

PV array 7 and OP 3

No glare found

PV array 7 and OP 4

No glare found

PV array 7 and OP 5

No glare found

PV array 7 and OP 10

No glare found

PV array 7 and OP 11

No glare found

PV array 7 and OP 13

No glare found

PV array 7 and OP 16

No glare found

PV array 7 and OP 17

No glare found

PV: PV array 8 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 8 and OP 1

No glare found

PV array 8 and OP 2

No glare found

PV array 8 and OP 3

No glare found

PV array 8 and OP 4

No glare found

PV array 8 and OP 5

No glare found

PV array 8 and OP 6

No glare found

PV array 8 and OP 7

No glare found

PV array 8 and OP 8

No glare found

PV array 8 and OP 9

No glare found

PV array 8 and OP 10

No glare found

PV array 8 and OP 11

No glare found

PV array 8 and OP 12

No glare found

PV array 8 and OP 13

No glare found

PV array 8 and OP 14

No glare found

PV array 8 and OP 15

No glare found

PV array 8 and OP 16

No glare found

PV array 8 and OP 17

No glare found

PV: PV array 9 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 9 and OP 1

No glare found

PV array 9 and OP 2

No glare found

PV array 9 and OP 3

No glare found

PV array 9 and OP 4

No glare found

PV array 9 and OP 5

No glare found

PV array 9 and OP 6

No glare found

PV array 9 and OP 7

No glare found

PV array 9 and OP 8

No glare found

PV array 9 and OP 9

No glare found

PV array 9 and OP 10

No glare found

PV array 9 and OP 11

No glare found

PV array 9 and OP 12

No glare found

PV array 9 and OP 13

No glare found

PV array 9 and OP 14

No glare found

PV array 9 and OP 15

No glare found

PV array 9 and OP 16

No glare found

PV array 9 and OP 17

No glare found

Assumptions

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

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

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

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Glint & Glare Appendix B
Scenario 2

FORGESOLAR GLARE ANALYSIS

Project: **2321 GUNDARY SOLAR FARM**
Site configuration: **2321 GUNDARY SF A**

Client: UMWELT

Created 11 May, 2023
Updated 05 Sep, 2023
Time-step 1 minute
Timezone offset UTC10
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 90321.15924

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

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 4	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 7	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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.

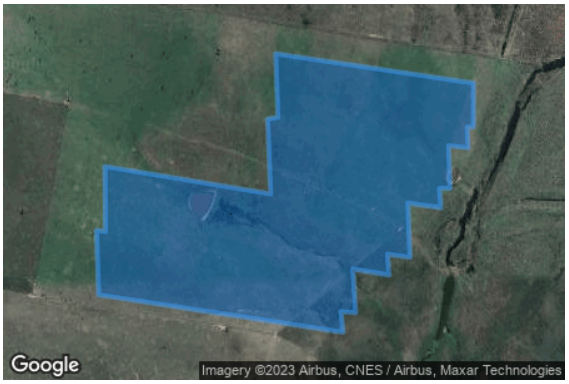
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840456	149.755350	675.25	1.95	677.20
2	-34.840842	149.758197	672.75	1.95	674.70
3	-34.839794	149.758144	676.52	1.95	678.47
4	-34.839764	149.758322	676.87	1.95	678.82
5	-34.838872	149.758283	677.61	1.95	679.56
6	-34.839286	149.761683	652.30	1.95	654.25
7	-34.839897	149.761681	652.06	1.95	654.01
8	-34.839903	149.761575	653.51	1.95	655.46
9	-34.840194	149.761589	652.81	1.95	654.76
10	-34.840164	149.761253	656.23	1.95	658.18
11	-34.840764	149.761281	653.53	1.95	655.48
12	-34.840764	149.761097	654.88	1.95	656.83
13	-34.841036	149.761122	652.81	1.95	654.76
14	-34.840969	149.760553	656.86	1.95	658.81
15	-34.841733	149.760592	651.87	1.95	653.82
16	-34.841689	149.760203	655.00	1.95	656.95
17	-34.841981	149.760231	653.26	1.95	655.21
18	-34.841897	149.759608	659.68	1.95	661.63
19	-34.842511	149.759658	657.56	1.95	659.51
20	-34.842497	149.759408	659.19	1.95	661.14
21	-34.842786	149.759439	658.50	1.95	660.45
22	-34.842261	149.755242	679.24	1.95	681.19
23	-34.841353	149.755203	676.42	1.95	678.37
24	-34.841369	149.755361	676.81	1.95	678.76

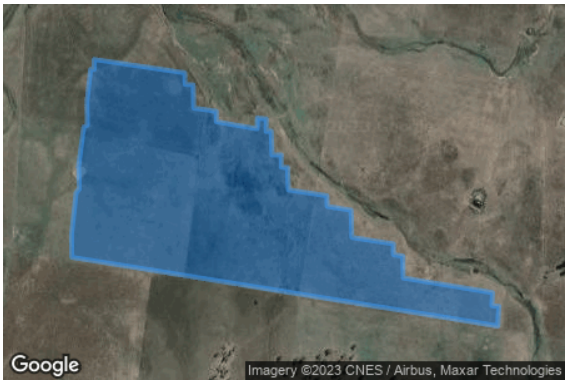
Name: PV array 10
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854681	149.788294	689.54	1.95	691.49
2	-34.854657	149.788044	689.39	1.95	691.34
3	-34.854036	149.788026	692.11	1.95	694.06
4	-34.854010	149.787787	691.97	1.95	693.92
5	-34.853389	149.787776	691.87	1.95	693.82
6	-34.853464	149.788267	693.88	1.95	695.83

Name: PV array 11
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

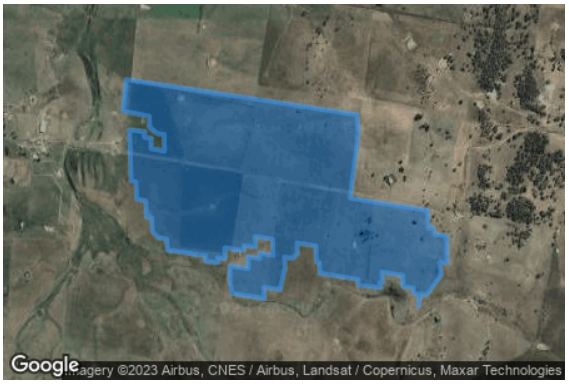
Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853629	149.789463	692.51	1.95	694.46
2	-34.854545	149.789498	688.36	1.95	690.31
3	-34.854551	149.789619	688.95	1.95	690.90
4	-34.855170	149.789627	687.82	1.95	689.77
5	-34.855020	149.788506	686.04	1.95	687.99
6	-34.854078	149.788476	691.03	1.95	692.98
7	-34.854096	149.788651	689.99	1.95	691.94
8	-34.853515	149.788637	692.65	1.95	694.60

Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858389	149.762044	654.78	1.95	656.73
2	-34.858763	149.765150	654.46	1.95	656.41
3	-34.859087	149.765169	655.94	1.95	657.89
4	-34.859107	149.765445	655.09	1.95	657.04
5	-34.859756	149.765464	657.08	1.95	659.03
6	-34.859846	149.766237	655.17	1.95	657.12
7	-34.860139	149.766237	655.26	1.95	657.21
8	-34.860337	149.767642	653.16	1.95	655.11
9	-34.860035	149.767650	652.68	1.95	654.63
10	-34.860060	149.767953	652.64	1.95	654.59
11	-34.860414	149.767951	653.24	1.95	655.19
12	-34.860401	149.768125	653.19	1.95	655.14
13	-34.861070	149.768155	654.66	1.95	656.61
14	-34.861072	149.768471	654.35	1.95	656.30
15	-34.861415	149.768471	655.30	1.95	657.25
16	-34.861426	149.768686	655.44	1.95	657.39
17	-34.862054	149.768715	656.53	1.95	658.48
18	-34.862219	149.770037	655.98	1.95	657.93
19	-34.862518	149.770054	657.26	1.95	659.21
20	-34.862624	149.770872	660.29	1.95	662.24
21	-34.863389	149.770896	664.47	1.95	666.42
22	-34.863570	149.772327	662.49	1.95	664.44
23	-34.863872	149.772327	664.38	1.95	666.33
24	-34.863916	149.772649	663.73	1.95	665.68
25	-34.864530	149.772662	667.21	1.95	669.16
26	-34.864941	149.775730	660.60	1.95	662.55
27	-34.865307	149.775709	661.69	1.95	663.64
28	-34.865324	149.775948	661.21	1.95	663.16
29	-34.865877	149.775910	664.14	1.95	666.09
30	-34.863949	149.761276	660.39	1.95	662.34
31	-34.863321	149.761262	658.42	1.95	660.37
32	-34.862142	149.761421	654.55	1.95	656.50
33	-34.862025	149.761536	654.61	1.95	656.56
34	-34.861411	149.761501	654.38	1.95	656.33
35	-34.860282	149.761686	655.50	1.95	657.45
36	-34.860234	149.761807	655.78	1.95	657.73
37	-34.859571	149.761793	654.80	1.95	656.75
38	-34.858667	149.761920	654.60	1.95	656.55
39	-34.858675	149.762038	654.78	1.95	656.73

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.845411	149.763747	652.46	1.95	654.41
2	-34.847392	149.779619	707.21	1.95	709.16
3	-34.848408	149.779711	704.09	1.95	706.04
4	-34.852081	149.779147	685.99	1.95	687.94
5	-34.852786	149.784478	691.16	1.95	693.11
6	-34.853775	149.784508	691.71	1.95	693.66
7	-34.853775	149.784878	689.84	1.95	691.79
8	-34.854100	149.784925	690.53	1.95	692.48
9	-34.854219	149.785789	685.62	1.95	687.57
10	-34.855742	149.785800	682.29	1.95	684.24
11	-34.855683	149.785310	685.04	1.95	686.99
12	-34.856422	149.785389	681.50	1.95	683.45
13	-34.857511	149.784392	682.41	1.95	684.36
14	-34.857481	149.783917	687.18	1.95	689.13
15	-34.858167	149.783881	680.46	1.95	682.41
16	-34.857481	149.783808	688.31	1.95	690.26
17	-34.857436	149.783517	691.61	1.95	693.56
18	-34.857131	149.783481	694.73	1.95	696.68
19	-34.857050	149.782769	697.28	1.95	699.23
20	-34.856428	149.782753	702.34	1.95	704.29
21	-34.856247	149.781331	690.38	1.95	692.33
22	-34.856842	149.781372	686.61	1.95	688.56
23	-34.856842	149.781181	684.12	1.95	686.07
24	-34.857128	149.781225	681.30	1.95	683.25
25	-34.856967	149.779683	671.16	1.95	673.11
26	-34.856650	149.779697	671.81	1.95	673.76
27	-34.856311	149.777061	674.88	1.95	676.83
28	-34.855703	149.777025	677.46	1.95	679.41
29	-34.855667	149.776828	677.06	1.95	679.01
30	-34.854769	149.776781	677.81	1.95	679.76
31	-34.854597	149.775486	674.67	1.95	676.62
32	-34.855203	149.775514	675.51	1.95	677.46
33	-34.855472	149.775192	675.81	1.95	677.76
34	-34.855406	149.774631	673.87	1.95	675.82
35	-34.856003	149.774686	674.26	1.95	676.21
36	-34.857236	149.774311	667.81	1.95	669.76
37	-34.857097	149.773200	666.06	1.95	668.01
38	-34.857725	149.773250	663.66	1.95	665.61
39	-34.857439	149.771031	657.32	1.95	659.27
40	-34.856844	149.770881	658.78	1.95	660.73
41	-34.855897	149.770853	661.80	1.95	663.75
42	-34.856044	149.772136	665.70	1.95	667.65
43	-34.855386	149.772106	666.67	1.95	668.62
44	-34.855475	149.772917	667.66	1.95	669.61
45	-34.855178	149.772928	667.97	1.95	669.92
46	-34.855297	149.773847	670.37	1.95	672.32
47	-34.854400	149.773822	667.85	1.95	669.80
48	-34.854247	149.772617	670.96	1.95	672.91
49	-34.854831	149.772658	668.72	1.95	670.67
50	-34.854761	149.771839	667.26	1.95	669.21
51	-34.855033	149.771839	666.77	1.95	668.72
52	-34.854889	149.770528	663.03	1.95	664.98
53	-34.855489	149.770544	662.17	1.95	664.12
54	-34.855433	149.770022	661.56	1.95	663.51
55	-34.855714	149.770078	660.72	1.95	662.67
56	-34.855625	149.769203	659.64	1.95	661.59
57	-34.855331	149.769208	660.52	1.95	662.47
58	-34.855006	149.766578	654.49	1.95	656.44
59	-34.854394	149.766550	657.29	1.95	659.24

Name: PV array 14
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840718	149.772712	672.26	1.95	674.21
2	-34.840814	149.773442	671.97	1.95	673.92
3	-34.841456	149.773456	675.07	1.95	677.02
4	-34.841747	149.773419	676.57	1.95	678.52
5	-34.841731	149.773314	676.64	1.95	678.59
6	-34.842339	149.773342	678.44	1.95	680.39
7	-34.842631	149.773217	678.20	1.95	680.15
8	-34.842756	149.773061	677.22	1.95	679.17
9	-34.843378	149.773086	674.65	1.95	676.60
10	-34.843647	149.773042	673.22	1.95	675.17
11	-34.843625	149.772867	672.64	1.95	674.59
12	-34.844278	149.772897	670.46	1.95	672.41
13	-34.844536	149.772847	669.57	1.95	671.52
14	-34.844522	149.772678	668.82	1.95	670.77
15	-34.845225	149.772706	668.61	1.95	670.56
16	-34.845481	149.772669	668.60	1.95	670.55
17	-34.845486	149.772600	668.15	1.95	670.10
18	-34.846100	149.772636	668.91	1.95	670.86
19	-34.846103	149.772514	668.39	1.95	670.34
20	-34.846381	149.772536	668.80	1.95	670.75
21	-34.845264	149.763456	651.54	1.95	653.49
22	-34.844958	149.763439	651.17	1.95	653.12
23	-34.844922	149.763219	650.29	1.95	652.24
24	-34.843692	149.763178	648.91	1.95	650.86
25	-34.844175	149.766897	654.86	1.95	656.81
26	-34.844772	149.766933	655.27	1.95	657.22
27	-34.845303	149.771283	663.76	1.95	665.71
28	-34.844328	149.771242	664.76	1.95	666.71
29	-34.843819	149.767178	655.00	1.95	656.95
30	-34.843528	149.767169	655.11	1.95	657.06
31	-34.843097	149.763747	648.51	1.95	650.46
32	-34.842475	149.763756	648.01	1.95	649.96
33	-34.842494	149.764075	648.08	1.95	650.03
34	-34.841894	149.764058	648.00	1.95	649.95
35	-34.841903	149.764161	648.00	1.95	649.95
36	-34.841614	149.764144	647.51	1.95	649.46
37	-34.841956	149.767048	654.66	1.95	656.61
38	-34.840915	149.767103	652.33	1.95	654.28
39	-34.840928	149.767232	652.75	1.95	654.70
40	-34.840081	149.767326	653.68	1.95	655.63
41	-34.840302	149.769306	665.37	1.95	667.32
42	-34.840380	149.769919	668.21	1.95	670.16
43	-34.840484	149.770793	669.07	1.95	671.02
44	-34.840569	149.771476	669.92	1.95	671.87

Name: PV array 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858406	149.770000	655.09	1.95	657.04
2	-34.859275	149.776911	670.07	1.95	672.02
3	-34.858694	149.776881	667.72	1.95	669.67
4	-34.858422	149.777164	667.36	1.95	669.31
5	-34.858517	149.777869	669.53	1.95	671.48
6	-34.857853	149.777822	668.66	1.95	670.61
7	-34.857567	149.778106	669.19	1.95	671.14
8	-34.857733	149.779386	673.06	1.95	675.01
9	-34.858044	149.779392	674.91	1.95	676.86
10	-34.858317	149.781619	676.41	1.95	678.36
11	-34.859039	149.781789	677.78	1.95	679.73
12	-34.859308	149.781792	679.96	1.95	681.91
13	-34.859375	149.782231	679.89	1.95	681.84
14	-34.859536	149.782239	681.33	1.95	683.28
15	-34.859567	149.782506	681.61	1.95	683.56
16	-34.860022	149.782522	686.44	1.95	688.39
17	-34.860122	149.783111	688.43	1.95	690.38
18	-34.859500	149.783086	682.00	1.95	683.95
19	-34.859569	149.783803	683.21	1.95	685.16
20	-34.859289	149.783789	681.37	1.95	683.32
21	-34.859447	149.785550	682.53	1.95	684.48
22	-34.858550	149.785517	679.87	1.95	681.82
23	-34.858550	149.785744	680.18	1.95	682.13
24	-34.857958	149.785717	677.91	1.95	679.86
25	-34.858142	149.787292	680.38	1.95	682.33
26	-34.858758	149.787306	683.68	1.95	685.63
27	-34.858850	149.787914	683.32	1.95	685.27
28	-34.859147	149.787919	684.39	1.95	686.34
29	-34.859217	149.788481	683.00	1.95	684.95
30	-34.859839	149.788483	684.87	1.95	686.82
31	-34.859889	149.788428	685.10	1.95	687.05
32	-34.860054	149.788430	685.75	1.95	687.70
33	-34.860358	149.788434	687.01	1.95	688.96
34	-34.860727	149.788435	688.51	1.95	690.46
35	-34.861000	149.788452	689.51	1.95	691.46
36	-34.861206	149.788459	689.25	1.95	691.20
37	-34.861380	149.788465	689.05	1.95	691.00
38	-34.861585	149.788469	688.82	1.95	690.77
39	-34.861731	149.788458	689.04	1.95	690.99
40	-34.861660	149.787962	691.38	1.95	693.33
41	-34.861623	149.787682	693.41	1.95	695.36
42	-34.861578	149.787337	694.64	1.95	696.59
43	-34.861491	149.786699	694.22	1.95	696.17
44	-34.861439	149.786264	691.51	1.95	693.46
45	-34.861253	149.784794	688.21	1.95	690.16
46	-34.861211	149.784530	689.95	1.95	691.90
47	-34.861151	149.784191	691.97	1.95	693.92
48	-34.861125	149.784062	692.51	1.95	694.46
49	-34.861102	149.783899	693.26	1.95	695.21
50	-34.861085	149.783822	693.65	1.95	695.60
51	-34.861071	149.783685	694.25	1.95	696.20
52	-34.861043	149.783443	695.39	1.95	697.34
53	-34.859242	149.769586	655.35	1.95	657.30
54	-34.858619	149.769571	655.00	1.95	656.95
55	-34.858669	149.769994	655.22	1.95	657.17

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854928	149.786786	682.51	1.95	684.46
2	-34.855153	149.788475	685.33	1.95	687.28
3	-34.855178	149.788637	684.59	1.95	686.54
4	-34.855197	149.788745	684.14	1.95	686.09
5	-34.855216	149.788878	683.68	1.95	685.63
6	-34.855257	149.789198	684.90	1.95	686.85
7	-34.855306	149.789552	687.26	1.95	689.21
8	-34.855581	149.791525	700.41	1.95	702.36
9	-34.854836	149.791494	701.31	1.95	703.26
10	-34.854864	149.791889	701.91	1.95	703.86
11	-34.854581	149.791869	701.25	1.95	703.20
12	-34.854628	149.792308	701.24	1.95	703.19
13	-34.854017	149.792292	699.50	1.95	701.45
14	-34.854047	149.792558	699.02	1.95	700.97
15	-34.853761	149.792550	699.97	1.95	701.92
16	-34.853831	149.793075	699.31	1.95	701.26
17	-34.854142	149.793086	698.06	1.95	700.01
18	-34.854433	149.795772	705.20	1.95	707.15
19	-34.855344	149.795817	705.80	1.95	707.75
20	-34.856011	149.795669	708.16	1.95	710.11
21	-34.856144	149.795500	709.31	1.95	711.26
22	-34.856744	149.795525	708.98	1.95	710.93
23	-34.856639	149.794693	710.56	1.95	712.51
24	-34.856929	149.794705	710.54	1.95	712.49
25	-34.856917	149.794600	710.75	1.95	712.70
26	-34.857533	149.794625	709.83	1.95	711.78
27	-34.857822	149.794578	709.08	1.95	711.03
28	-34.857867	149.794406	709.56	1.95	711.51
29	-34.858489	149.794442	706.20	1.95	708.15
30	-34.858772	149.794394	704.16	1.95	706.11
31	-34.858753	149.794222	704.23	1.95	706.18
32	-34.859358	149.794253	699.89	1.95	701.84
33	-34.859356	149.794136	699.89	1.95	701.84
34	-34.859644	149.794147	697.80	1.95	699.75
35	-34.859267	149.791322	687.69	1.95	689.64
36	-34.858947	149.791308	688.01	1.95	689.96
37	-34.858900	149.790925	685.57	1.95	687.52
38	-34.858286	149.790900	686.54	1.95	688.49
39	-34.858083	149.789519	683.80	1.95	685.75
40	-34.857792	149.789519	683.80	1.95	685.75
41	-34.857742	149.789139	683.25	1.95	685.20
42	-34.857125	149.789114	683.46	1.95	685.41
43	-34.857064	149.788703	682.21	1.95	684.16
44	-34.857678	149.788719	682.27	1.95	684.22
45	-34.857631	149.788367	681.25	1.95	683.20
46	-34.856964	149.788344	681.16	1.95	683.11
47	-34.856719	149.786636	678.00	1.95	679.95
48	-34.856106	149.786614	679.61	1.95	681.56
49	-34.855211	149.786697	681.71	1.95	683.66

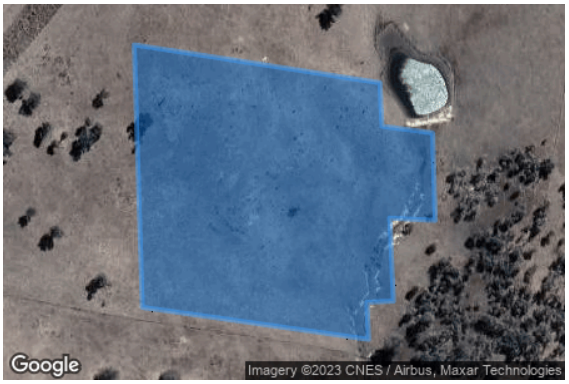
Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.859419	149.769711	655.67	1.95	657.62
2	-34.861188	149.783350	696.52	1.95	698.47
3	-34.861232	149.783715	695.09	1.95	697.04
4	-34.861282	149.784147	693.17	1.95	695.12
5	-34.861345	149.784637	689.71	1.95	691.66
6	-34.862506	149.793494	693.21	1.95	695.16
7	-34.863142	149.793542	694.26	1.95	696.21
8	-34.866122	149.792931	694.11	1.95	696.06
9	-34.865931	149.791367	702.04	1.95	703.99
10	-34.865333	149.791322	703.42	1.95	705.37
11	-34.865036	149.791375	703.20	1.95	705.15
12	-34.865019	149.791258	703.60	1.95	705.55
13	-34.864686	149.790997	703.23	1.95	705.18
14	-34.864553	149.789928	704.25	1.95	706.20
15	-34.863931	149.789911	701.83	1.95	703.78
16	-34.863808	149.789000	698.34	1.95	700.29
17	-34.864411	149.789019	700.24	1.95	702.19
18	-34.864303	149.788022	694.23	1.95	696.18
19	-34.864583	149.788039	694.66	1.95	696.61
20	-34.864439	149.786811	697.29	1.95	699.24
21	-34.865050	149.786856	697.08	1.95	699.03
22	-34.865314	149.786586	697.74	1.95	699.69
23	-34.865150	149.785300	694.98	1.95	696.93
24	-34.864858	149.785286	695.42	1.95	697.37
25	-34.864750	149.784472	695.43	1.95	697.38
26	-34.864730	149.784300	696.07	1.95	698.02
27	-34.864708	149.784110	696.73	1.95	698.68
28	-34.864983	149.784128	696.32	1.95	698.27
29	-34.864675	149.781517	703.05	1.95	705.00
30	-34.864367	149.781494	702.23	1.95	704.18
31	-34.864328	149.781228	700.18	1.95	702.13
32	-34.863703	149.781219	698.95	1.95	700.90
33	-34.863708	149.781372	700.44	1.95	702.39
34	-34.863419	149.781353	699.61	1.95	701.56
35	-34.863236	149.779844	691.61	1.95	693.56
36	-34.863519	149.779856	690.43	1.95	692.38
37	-34.863342	149.778442	682.56	1.95	684.51
38	-34.863936	149.778461	678.80	1.95	680.75
39	-34.863886	149.777744	674.62	1.95	676.57
40	-34.864161	149.777750	672.97	1.95	674.92
41	-34.864058	149.776792	667.31	1.95	669.26
42	-34.863769	149.776778	669.04	1.95	670.99
43	-34.863364	149.773750	660.53	1.95	662.48
44	-34.862753	149.773742	661.26	1.95	663.21
45	-34.862656	149.773025	660.60	1.95	662.55
46	-34.862372	149.773017	661.22	1.95	663.17
47	-34.862250	149.772294	661.76	1.95	663.71
48	-34.861636	149.772283	662.10	1.95	664.05
49	-34.861336	149.770414	657.93	1.95	659.88
50	-34.860978	149.770014	657.15	1.95	659.10
51	-34.860361	149.769983	656.71	1.95	658.66
52	-34.860352	149.769682	655.91	1.95	657.86

Name: PV array 5
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.866069	149.791139	701.41	1.95	703.36
2	-34.866275	149.792711	694.92	1.95	696.87
3	-34.867181	149.792725	694.34	1.95	696.29
4	-34.867058	149.791775	696.40	1.95	698.35
5	-34.866747	149.791756	697.15	1.95	699.10
6	-34.866678	149.791158	699.92	1.95	701.87

Name: PV array 6
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864939	149.782561	702.09	1.95	704.04
2	-34.865206	149.784672	693.63	1.95	695.58
3	-34.865511	149.784689	693.01	1.95	694.96
4	-34.865558	149.785125	694.61	1.95	696.56
5	-34.866172	149.785147	693.39	1.95	695.34
6	-34.866156	149.784756	690.39	1.95	692.34
7	-34.866739	149.784789	688.82	1.95	690.77
8	-34.866747	149.784561	687.86	1.95	689.81
9	-34.867008	149.784575	686.24	1.95	688.19
10	-34.866783	149.782631	699.00	1.95	700.95

Name: PV array 7
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864660	149.778232	674.47	1.95	676.42
2	-34.864670	149.778331	675.34	1.95	677.29
3	-34.864680	149.778433	676.22	1.95	678.17
4	-34.864698	149.778569	677.49	1.95	679.44
5	-34.864713	149.778664	678.31	1.95	680.26
6	-34.864418	149.778643	677.80	1.95	679.75
7	-34.864425	149.778731	678.62	1.95	680.57
8	-34.865039	149.778767	680.03	1.95	681.98
9	-34.865042	149.778650	678.66	1.95	680.61
10	-34.865319	149.778669	678.68	1.95	680.63
11	-34.865292	149.778386	675.36	1.95	677.31
12	-34.865894	149.778403	674.05	1.95	676.00
13	-34.865903	149.778250	672.04	1.95	673.99
14	-34.866181	149.778256	670.94	1.95	672.89
15	-34.866158	149.778006	667.76	1.95	669.71
16	-34.865242	149.777983	670.58	1.95	672.53
17	-34.865254	149.778092	671.86	1.95	673.81
18	-34.864955	149.778101	672.70	1.95	674.65
19	-34.864652	149.778112	673.44	1.95	675.39

Name: PV array 8
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.861793	149.789000	688.70	1.95	690.65
2	-34.862401	149.793651	693.05	1.95	695.00
3	-34.862093	149.793694	691.55	1.95	693.50
4	-34.861472	149.793673	688.72	1.95	690.67
5	-34.861217	149.791758	688.32	1.95	690.27
6	-34.860601	149.791725	686.00	1.95	687.95
7	-34.860556	149.791328	687.34	1.95	689.29
8	-34.860266	149.791334	687.14	1.95	689.09
9	-34.860143	149.790352	686.29	1.95	688.24
10	-34.859460	149.790336	683.76	1.95	685.71
11	-34.859302	149.789038	683.43	1.95	685.38
12	-34.859945	149.788957	684.94	1.95	686.89

Name: PV array 9
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853669	149.787596	691.34	1.95	693.29
2	-34.854597	149.787623	689.26	1.95	691.21
3	-34.854562	149.787377	687.65	1.95	689.60
4	-34.853644	149.787352	689.28	1.95	691.23

Route Receptors

Name: Kooringaroo Road
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.844894	149.797785	700.88	2.40	703.28
2	-34.845405	149.797839	701.95	2.40	704.35
3	-34.845951	149.797839	703.24	2.40	705.64
4	-34.846461	149.797667	703.72	2.40	706.12
5	-34.847201	149.797324	703.91	2.40	706.31
6	-34.847958	149.797195	705.08	2.40	707.48
7	-34.849341	149.797324	704.87	2.40	707.27
8	-34.850441	149.797796	706.13	2.40	708.53
9	-34.851753	149.798514	706.49	2.40	708.89
10	-34.851939	149.798593	705.97	2.40	708.37
11	-34.852547	149.798599	705.19	2.40	707.59
12	-34.852771	149.798593	704.93	2.40	707.33
13	-34.853040	149.798615	704.39	2.40	706.79
14	-34.853405	149.798706	703.13	2.40	705.53
15	-34.853634	149.798856	701.27	2.40	703.67
16	-34.853753	149.799179	698.70	2.40	701.10
17	-34.854386	149.803824	706.81	2.40	709.21
18	-34.854440	149.803980	707.21	2.40	709.61
19	-34.854545	149.804131	707.69	2.40	710.09
20	-34.854779	149.804259	708.11	2.40	710.51
21	-34.856232	149.804463	705.67	2.40	708.07
22	-34.857038	149.804442	706.36	2.40	708.76
23	-34.857666	149.804434	709.30	2.40	711.70
24	-34.858094	149.804444	710.53	2.40	712.93
25	-34.858255	149.804528	710.98	2.40	713.38
26	-34.859954	149.805322	714.53	2.40	716.93
27	-34.860861	149.805901	718.87	2.40	721.27

Name: Windellama Road
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.834436	149.746048	677.52	2.40	679.92
2	-34.836286	149.745962	679.80	2.40	682.20
3	-34.839443	149.745632	678.70	2.40	681.10
4	-34.844828	149.744791	681.97	2.40	684.37
5	-34.846403	149.744502	680.38	2.40	682.78

Flight Path Receptors

Name: FP 1
Description:
Threshold height: 15 m
Direction: 223.8°
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	-34.805429	149.732106	636.07	15.24	651.31
Two-mile	-34.784578	149.756529	662.01	157.98	819.99

Name: FP 2
Description:
Threshold height: 15 m
Direction: 46.6°
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	-34.813216	149.721592	652.85	15.24	668.09
Two-mile	-34.833085	149.695979	659.64	177.14	836.78

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-34.883425	149.782499	678.14	1.50
OP 2	2	-34.877136	149.804446	725.31	1.50
OP 3	3	-34.859601	149.799602	695.53	1.50
OP 4	4	-34.858549	149.805847	717.10	1.50
OP 5	5	-34.857731	149.803540	709.27	1.50
OP 6	6	-34.855640	149.806088	719.97	1.50
OP 7	7	-34.850278	149.805584	728.28	1.50
OP 8	8	-34.851951	149.795252	724.46	1.50
OP 9	9	-34.846589	149.792266	723.70	1.50
OP 10	10	-34.828718	149.789979	689.94	1.50
OP 11	11	-34.828221	149.793890	702.36	1.50
OP 12	12	-34.817370	149.770320	675.10	1.50
OP 13	13	-34.818471	149.770658	674.38	1.50
OP 14	14	-34.819313	149.769430	671.09	1.50
OP 15	15	-34.831701	149.749292	678.80	1.50
OP 16	16	-34.831833	149.749689	678.33	1.50
OP 17	17	-34.831833	149.751459	668.36	1.50
OP 18	18	-34.832753	149.748745	680.80	1.50
OP 19	19	-34.834789	149.748397	669.25	1.50
OP 20	20	-34.834983	149.748166	669.30	1.50
OP 21	21	-34.836595	149.755113	673.20	1.50
OP 22	22	-34.844590	149.750204	683.40	1.50
OP 23	23	-34.851920	149.754485	667.64	1.50
OP 24	24	-34.844028	149.737691	706.23	1.50
OP 25	25	-34.848039	149.746730	694.73	1.50
OP 26	26	-34.847273	149.748334	696.18	1.50
OP 27	27	-34.847599	149.739714	689.48	1.50
OP 28	28	-34.851350	149.738663	686.00	1.50
OP 29	29	-34.852512	149.738963	685.00	1.50
OP 30	30	-34.854783	149.737118	696.95	1.50
OP 31	31	-34.856359	149.740187	682.37	1.50
OP 32	32	-34.871366	149.737596	678.33	1.50
OP 33	33	-34.875353	149.740535	675.81	1.50
OP 34	34	-34.877175	149.741179	677.38	1.50
OP 35	35	-34.870409	149.740978	672.18	1.50
OP 36	36	-34.818114	149.786580	698.85	1.50
OP 37	37	-34.851735	149.731624	682.75	1.50
OP 38	38	-34.872269	149.735245	679.71	1.50
OP 39	39	-34.847496	149.755791	666.00	1.50
OP 40	40	-34.853988	149.749772	670.60	1.50

Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 4	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 7	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	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

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV: PV array 1 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 1 and Route: Kooringaroo Road

No glare found

PV array 1 and Route: Windellama Road

No glare found

PV array 1 and FP: FP 1

No glare found

PV array 1 and FP: FP 2

No glare found

PV array 1 and OP 1

No glare found

PV array 1 and OP 2

No glare found

PV array 1 and OP 3

No glare found

PV array 1 and OP 4

No glare found

PV array 1 and OP 5

No glare found

PV array 1 and OP 6

No glare found

PV array 1 and OP 7

No glare found

PV array 1 and OP 8

No glare found

PV array 1 and OP 9

No glare found

PV array 1 and OP 10

No glare found

PV array 1 and OP 11

No glare found

PV array 1 and OP 12

No glare found

PV array 1 and OP 13

No glare found

PV array 1 and OP 14

No glare found

PV array 1 and OP 15

No glare found

PV array 1 and OP 16

No glare found

PV array 1 and OP 17

No glare found

PV array 1 and OP 18

No glare found

PV array 1 and OP 19

No glare found

PV array 1 and OP 20

No glare found

PV array 1 and OP 21

No glare found

PV array 1 and OP 22

No glare found

PV array 1 and OP 23

No glare found

PV array 1 and OP 24

No glare found

PV array 1 and OP 25

No glare found

PV array 1 and OP 26

No glare found

PV array 1 and OP 27

No glare found

PV array 1 and OP 28

No glare found

PV array 1 and OP 29

No glare found

PV array 1 and OP 30

No glare found

PV array 1 and OP 31

No glare found

PV array 1 and OP 32

No glare found

PV array 1 and OP 33

No glare found

PV array 1 and OP 34

No glare found

PV array 1 and OP 35

No glare found

PV array 1 and OP 36

No glare found

PV array 1 and OP 37

No glare found

PV array 1 and OP 38

No glare found

PV array 1 and OP 39

No glare found

PV array 1 and OP 40

No glare found

PV: PV array 10 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 10 and Route: Kooringaroo Road

No glare found

PV array 10 and Route: Windellama Road

No glare found

PV array 10 and FP: FP 1

No glare found

PV array 10 and FP: FP 2

No glare found

PV array 10 and OP 1

No glare found

PV array 10 and OP 2

No glare found

PV array 10 and OP 3

No glare found

PV array 10 and OP 4

No glare found

PV array 10 and OP 5

No glare found

PV array 10 and OP 6

No glare found

PV array 10 and OP 7

No glare found

PV array 10 and OP 8

No glare found

PV array 10 and OP 9

No glare found

PV array 10 and OP 10

No glare found

PV array 10 and OP 11

No glare found

PV array 10 and OP 12

No glare found

PV array 10 and OP 13

No glare found

PV array 10 and OP 14

No glare found

PV array 10 and OP 15

No glare found

PV array 10 and OP 16

No glare found

PV array 10 and OP 17

No glare found

PV array 10 and OP 18

No glare found

PV array 10 and OP 19

No glare found

PV array 10 and OP 20

No glare found

PV array 10 and OP 21

No glare found

PV array 10 and OP 22

No glare found

PV array 10 and OP 23

No glare found

PV array 10 and OP 24

No glare found

PV array 10 and OP 25

No glare found

PV array 10 and OP 26

No glare found

PV array 10 and OP 27

No glare found

PV array 10 and OP 28

No glare found

PV array 10 and OP 29

No glare found

PV array 10 and OP 30

No glare found

PV array 10 and OP 31

No glare found

PV array 10 and OP 32

No glare found

PV array 10 and OP 33

No glare found

PV array 10 and OP 34

No glare found

PV array 10 and OP 35

No glare found

PV array 10 and OP 36

No glare found

PV array 10 and OP 37

No glare found

PV array 10 and OP 38

No glare found

PV array 10 and OP 39

No glare found

PV array 10 and OP 40

No glare found

PV: PV array 11 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 11 and Route: Kooringaroo Road

No glare found

PV array 11 and Route: Windellama Road

No glare found

PV array 11 and FP: FP 1

No glare found

PV array 11 and FP: FP 2

No glare found

PV array 11 and OP 1

No glare found

PV array 11 and OP 2

No glare found

PV array 11 and OP 3

No glare found

PV array 11 and OP 4

No glare found

PV array 11 and OP 5

No glare found

PV array 11 and OP 6

No glare found

PV array 11 and OP 7

No glare found

PV array 11 and OP 8

No glare found

PV array 11 and OP 9

No glare found

PV array 11 and OP 10

No glare found

PV array 11 and OP 11

No glare found

PV array 11 and OP 12

No glare found

PV array 11 and OP 13

No glare found

PV array 11 and OP 14

No glare found

PV array 11 and OP 15

No glare found

PV array 11 and OP 16

No glare found

PV array 11 and OP 17

No glare found

PV array 11 and OP 18

No glare found

PV array 11 and OP 19

No glare found

PV array 11 and OP 20

No glare found

PV array 11 and OP 21

No glare found

PV array 11 and OP 22

No glare found

PV array 11 and OP 23

No glare found

PV array 11 and OP 24

No glare found

PV array 11 and OP 25

No glare found

PV array 11 and OP 26

No glare found

PV array 11 and OP 27

No glare found

PV array 11 and OP 28

No glare found

PV array 11 and OP 29

No glare found

PV array 11 and OP 30

No glare found

PV array 11 and OP 31

No glare found

PV array 11 and OP 32

No glare found

PV array 11 and OP 33

No glare found

PV array 11 and OP 34

No glare found

PV array 11 and OP 35

No glare found

PV array 11 and OP 36

No glare found

PV array 11 and OP 37

No glare found

PV array 11 and OP 38

No glare found

PV array 11 and OP 39

No glare found

PV array 11 and OP 40

No glare found

PV: PV array 12 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 12 and Route: Kooringaroo Road

No glare found

PV array 12 and Route: Windellama Road

No glare found

PV array 12 and FP: FP 1

No glare found

PV array 12 and FP: FP 2

No glare found

PV array 12 and OP 1

No glare found

PV array 12 and OP 2

No glare found

PV array 12 and OP 3

No glare found

PV array 12 and OP 4

No glare found

PV array 12 and OP 5

No glare found

PV array 12 and OP 6

No glare found

PV array 12 and OP 7

No glare found

PV array 12 and OP 8

No glare found

PV array 12 and OP 9

No glare found

PV array 12 and OP 10

No glare found

PV array 12 and OP 11

No glare found

PV array 12 and OP 12

No glare found

PV array 12 and OP 13

No glare found

PV array 12 and OP 14

No glare found

PV array 12 and OP 15

No glare found

PV array 12 and OP 16

No glare found

PV array 12 and OP 17

No glare found

PV array 12 and OP 18

No glare found

PV array 12 and OP 19

No glare found

PV array 12 and OP 20

No glare found

PV array 12 and OP 21

No glare found

PV array 12 and OP 22

No glare found

PV array 12 and OP 23

No glare found

PV array 12 and OP 24

No glare found

PV array 12 and OP 25

No glare found

PV array 12 and OP 26

No glare found

PV array 12 and OP 27

No glare found

PV array 12 and OP 28

No glare found

PV array 12 and OP 29

No glare found

PV array 12 and OP 30

No glare found

PV array 12 and OP 31

No glare found

PV array 12 and OP 32

No glare found

PV array 12 and OP 33

No glare found

PV array 12 and OP 34

No glare found

PV array 12 and OP 35

No glare found

PV array 12 and OP 36

No glare found

PV array 12 and OP 37

No glare found

PV array 12 and OP 38

No glare found

PV array 12 and OP 39

No glare found

PV array 12 and OP 40

No glare found

PV: PV array 13 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 13 and Route: Kooringaroo Road

No glare found

PV array 13 and Route: Windellama Road

No glare found

PV array 13 and FP: FP 1

No glare found

PV array 13 and FP: FP 2

No glare found

PV array 13 and OP 1

No glare found

PV array 13 and OP 2

No glare found

PV array 13 and OP 3

No glare found

PV array 13 and OP 4

No glare found

PV array 13 and OP 5

No glare found

PV array 13 and OP 6

No glare found

PV array 13 and OP 7

No glare found

PV array 13 and OP 8

No glare found

PV array 13 and OP 9

No glare found

PV array 13 and OP 10

No glare found

PV array 13 and OP 11

No glare found

PV array 13 and OP 12

No glare found

PV array 13 and OP 13

No glare found

PV array 13 and OP 14

No glare found

PV array 13 and OP 15

No glare found

PV array 13 and OP 16

No glare found

PV array 13 and OP 17

No glare found

PV array 13 and OP 18

No glare found

PV array 13 and OP 19

No glare found

PV array 13 and OP 20

No glare found

PV array 13 and OP 21

No glare found

PV array 13 and OP 22

No glare found

PV array 13 and OP 23

No glare found

PV array 13 and OP 24

No glare found

PV array 13 and OP 25

No glare found

PV array 13 and OP 26

No glare found

PV array 13 and OP 27

No glare found

PV array 13 and OP 28

No glare found

PV array 13 and OP 29

No glare found

PV array 13 and OP 30

No glare found

PV array 13 and OP 31

No glare found

PV array 13 and OP 32

No glare found

PV array 13 and OP 33

No glare found

PV array 13 and OP 34

No glare found

PV array 13 and OP 35

No glare found

PV array 13 and OP 36

No glare found

PV array 13 and OP 37

No glare found

PV array 13 and OP 38

No glare found

PV array 13 and OP 39

No glare found

PV array 13 and OP 40

No glare found

PV: PV array 14 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 14 and Route: Kooringaroo Road

No glare found

PV array 14 and Route: Windellama Road

No glare found

PV array 14 and FP: FP 1

No glare found

PV array 14 and FP: FP 2

No glare found

PV array 14 and OP 1

No glare found

PV array 14 and OP 2

No glare found

PV array 14 and OP 3

No glare found

PV array 14 and OP 4

No glare found

PV array 14 and OP 5

No glare found

PV array 14 and OP 6

No glare found

PV array 14 and OP 7

No glare found

PV array 14 and OP 8

No glare found

PV array 14 and OP 9

No glare found

PV array 14 and OP 10

No glare found

PV array 14 and OP 11

No glare found

PV array 14 and OP 12

No glare found

PV array 14 and OP 13

No glare found

PV array 14 and OP 14

No glare found

PV array 14 and OP 15

No glare found

PV array 14 and OP 16

No glare found

PV array 14 and OP 17

No glare found

PV array 14 and OP 18

No glare found

PV array 14 and OP 19

No glare found

PV array 14 and OP 20

No glare found

PV array 14 and OP 21

No glare found

PV array 14 and OP 22

No glare found

PV array 14 and OP 23

No glare found

PV array 14 and OP 24

No glare found

PV array 14 and OP 25

No glare found

PV array 14 and OP 26

No glare found

PV array 14 and OP 27

No glare found

PV array 14 and OP 28

No glare found

PV array 14 and OP 29

No glare found

PV array 14 and OP 30

No glare found

PV array 14 and OP 31

No glare found

PV array 14 and OP 32

No glare found

PV array 14 and OP 33

No glare found

PV array 14 and OP 34

No glare found

PV array 14 and OP 35

No glare found

PV array 14 and OP 36

No glare found

PV array 14 and OP 37

No glare found

PV array 14 and OP 38

No glare found

PV array 14 and OP 39

No glare found

PV array 14 and OP 40

No glare found

PV: PV array 2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 2 and Route: Kooringaroo Road

No glare found

PV array 2 and Route: Windellama Road

No glare found

PV array 2 and FP: FP 1

No glare found

PV array 2 and FP: FP 2

No glare found

PV array 2 and OP 1

No glare found

PV array 2 and OP 2

No glare found

PV array 2 and OP 3

No glare found

PV array 2 and OP 4

No glare found

PV array 2 and OP 5

No glare found

PV array 2 and OP 6

No glare found

PV array 2 and OP 7

No glare found

PV array 2 and OP 8

No glare found

PV array 2 and OP 9

No glare found

PV array 2 and OP 10

No glare found

PV array 2 and OP 11

No glare found

PV array 2 and OP 12

No glare found

PV array 2 and OP 13

No glare found

PV array 2 and OP 14

No glare found

PV array 2 and OP 15

No glare found

PV array 2 and OP 16

No glare found

PV array 2 and OP 17

No glare found

PV array 2 and OP 18

No glare found

PV array 2 and OP 19

No glare found

PV array 2 and OP 20

No glare found

PV array 2 and OP 21

No glare found

PV array 2 and OP 22

No glare found

PV array 2 and OP 23

No glare found

PV array 2 and OP 24

No glare found

PV array 2 and OP 25

No glare found

PV array 2 and OP 26

No glare found

PV array 2 and OP 27

No glare found

PV array 2 and OP 28

No glare found

PV array 2 and OP 29

No glare found

PV array 2 and OP 30

No glare found

PV array 2 and OP 31

No glare found

PV array 2 and OP 32

No glare found

PV array 2 and OP 33

No glare found

PV array 2 and OP 34

No glare found

PV array 2 and OP 35

No glare found

PV array 2 and OP 36

No glare found

PV array 2 and OP 37

No glare found

PV array 2 and OP 38

No glare found

PV array 2 and OP 39

No glare found

PV array 2 and OP 40

No glare found

PV: PV array 3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 3 and Route: Kooringaroo Road

No glare found

PV array 3 and Route: Windellama Road

No glare found

PV array 3 and FP: FP 1

No glare found

PV array 3 and FP: FP 2

No glare found

PV array 3 and OP 1

No glare found

PV array 3 and OP 2

No glare found

PV array 3 and OP 3

No glare found

PV array 3 and OP 4

No glare found

PV array 3 and OP 5

No glare found

PV array 3 and OP 6

No glare found

PV array 3 and OP 7

No glare found

PV array 3 and OP 8

No glare found

PV array 3 and OP 9

No glare found

PV array 3 and OP 10

No glare found

PV array 3 and OP 11

No glare found

PV array 3 and OP 12

No glare found

PV array 3 and OP 13

No glare found

PV array 3 and OP 14

No glare found

PV array 3 and OP 15

No glare found

PV array 3 and OP 16

No glare found

PV array 3 and OP 17

No glare found

PV array 3 and OP 18

No glare found

PV array 3 and OP 19

No glare found

PV array 3 and OP 20

No glare found

PV array 3 and OP 21

No glare found

PV array 3 and OP 22

No glare found

PV array 3 and OP 23

No glare found

PV array 3 and OP 24

No glare found

PV array 3 and OP 25

No glare found

PV array 3 and OP 26

No glare found

PV array 3 and OP 27

No glare found

PV array 3 and OP 28

No glare found

PV array 3 and OP 29

No glare found

PV array 3 and OP 30

No glare found

PV array 3 and OP 31

No glare found

PV array 3 and OP 32

No glare found

PV array 3 and OP 33

No glare found

PV array 3 and OP 34

No glare found

PV array 3 and OP 35

No glare found

PV array 3 and OP 36

No glare found

PV array 3 and OP 37

No glare found

PV array 3 and OP 38

No glare found

PV array 3 and OP 39

No glare found

PV array 3 and OP 40

No glare found

PV: PV array 4 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 4 and Route: Kooringaroo Road

No glare found

PV array 4 and Route: Windellama Road

No glare found

PV array 4 and FP: FP 1

No glare found

PV array 4 and FP: FP 2

No glare found

PV array 4 and OP 1

No glare found

PV array 4 and OP 2

No glare found

PV array 4 and OP 3

No glare found

PV array 4 and OP 4

No glare found

PV array 4 and OP 5

No glare found

PV array 4 and OP 6

No glare found

PV array 4 and OP 7

No glare found

PV array 4 and OP 8

No glare found

PV array 4 and OP 9

No glare found

PV array 4 and OP 10

No glare found

PV array 4 and OP 11

No glare found

PV array 4 and OP 12

No glare found

PV array 4 and OP 13

No glare found

PV array 4 and OP 14

No glare found

PV array 4 and OP 15

No glare found

PV array 4 and OP 16

No glare found

PV array 4 and OP 17

No glare found

PV array 4 and OP 18

No glare found

PV array 4 and OP 19

No glare found

PV array 4 and OP 20

No glare found

PV array 4 and OP 21

No glare found

PV array 4 and OP 22

No glare found

PV array 4 and OP 23

No glare found

PV array 4 and OP 24

No glare found

PV array 4 and OP 25

No glare found

PV array 4 and OP 26

No glare found

PV array 4 and OP 27

No glare found

PV array 4 and OP 28

No glare found

PV array 4 and OP 29

No glare found

PV array 4 and OP 30

No glare found

PV array 4 and OP 31

No glare found

PV array 4 and OP 32

No glare found

PV array 4 and OP 33

No glare found

PV array 4 and OP 34

No glare found

PV array 4 and OP 35

No glare found

PV array 4 and OP 36

No glare found

PV array 4 and OP 37

No glare found

PV array 4 and OP 38

No glare found

PV array 4 and OP 39

No glare found

PV array 4 and OP 40

No glare found

PV: PV array 5 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 5 and Route: Kooringaroo Road

No glare found

PV array 5 and Route: Windellama Road

No glare found

PV array 5 and FP: FP 1

No glare found

PV array 5 and FP: FP 2

No glare found

PV array 5 and OP 1

No glare found

PV array 5 and OP 2

No glare found

PV array 5 and OP 3

No glare found

PV array 5 and OP 4

No glare found

PV array 5 and OP 5

No glare found

PV array 5 and OP 6

No glare found

PV array 5 and OP 7

No glare found

PV array 5 and OP 8

No glare found

PV array 5 and OP 9

No glare found

PV array 5 and OP 10

No glare found

PV array 5 and OP 11

No glare found

PV array 5 and OP 12

No glare found

PV array 5 and OP 13

No glare found

PV array 5 and OP 14

No glare found

PV array 5 and OP 15

No glare found

PV array 5 and OP 16

No glare found

PV array 5 and OP 17

No glare found

PV array 5 and OP 18

No glare found

PV array 5 and OP 19

No glare found

PV array 5 and OP 20

No glare found

PV array 5 and OP 21

No glare found

PV array 5 and OP 22

No glare found

PV array 5 and OP 23

No glare found

PV array 5 and OP 24

No glare found

PV array 5 and OP 25

No glare found

PV array 5 and OP 26

No glare found

PV array 5 and OP 27

No glare found

PV array 5 and OP 28

No glare found

PV array 5 and OP 29

No glare found

PV array 5 and OP 30

No glare found

PV array 5 and OP 31

No glare found

PV array 5 and OP 32

No glare found

PV array 5 and OP 33

No glare found

PV array 5 and OP 34

No glare found

PV array 5 and OP 35

No glare found

PV array 5 and OP 36

No glare found

PV array 5 and OP 37

No glare found

PV array 5 and OP 38

No glare found

PV array 5 and OP 39

No glare found

PV array 5 and OP 40

No glare found

PV: PV array 6 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 6 and Route: Kooringaroo Road

No glare found

PV array 6 and Route: Windellama Road

No glare found

PV array 6 and FP: FP 1

No glare found

PV array 6 and FP: FP 2

No glare found

PV array 6 and OP 1

No glare found

PV array 6 and OP 2

No glare found

PV array 6 and OP 3

No glare found

PV array 6 and OP 4

No glare found

PV array 6 and OP 5

No glare found

PV array 6 and OP 6

No glare found

PV array 6 and OP 7

No glare found

PV array 6 and OP 8

No glare found

PV array 6 and OP 9

No glare found

PV array 6 and OP 10

No glare found

PV array 6 and OP 11

No glare found

PV array 6 and OP 12

No glare found

PV array 6 and OP 13

No glare found

PV array 6 and OP 14

No glare found

PV array 6 and OP 15

No glare found

PV array 6 and OP 16

No glare found

PV array 6 and OP 17

No glare found

PV array 6 and OP 18

No glare found

PV array 6 and OP 19

No glare found

PV array 6 and OP 20

No glare found

PV array 6 and OP 21

No glare found

PV array 6 and OP 22

No glare found

PV array 6 and OP 23

No glare found

PV array 6 and OP 24

No glare found

PV array 6 and OP 25

No glare found

PV array 6 and OP 26

No glare found

PV array 6 and OP 27

No glare found

PV array 6 and OP 28

No glare found

PV array 6 and OP 29

No glare found

PV array 6 and OP 30

No glare found

PV array 6 and OP 31

No glare found

PV array 6 and OP 32

No glare found

PV array 6 and OP 33

No glare found

PV array 6 and OP 34

No glare found

PV array 6 and OP 35

No glare found

PV array 6 and OP 36

No glare found

PV array 6 and OP 37

No glare found

PV array 6 and OP 38

No glare found

PV array 6 and OP 39

No glare found

PV array 6 and OP 40

No glare found

PV: PV array 7 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 7 and Route: Kooringaroo Road

No glare found

PV array 7 and Route: Windellama Road

No glare found

PV array 7 and FP: FP 1

No glare found

PV array 7 and FP: FP 2

No glare found

PV array 7 and OP 1

No glare found

PV array 7 and OP 2

No glare found

PV array 7 and OP 3

No glare found

PV array 7 and OP 4

No glare found

PV array 7 and OP 5

No glare found

PV array 7 and OP 6

No glare found

PV array 7 and OP 7

No glare found

PV array 7 and OP 8

No glare found

PV array 7 and OP 9

No glare found

PV array 7 and OP 10

No glare found

PV array 7 and OP 11

No glare found

PV array 7 and OP 12

No glare found

PV array 7 and OP 13

No glare found

PV array 7 and OP 14

No glare found

PV array 7 and OP 15

No glare found

PV array 7 and OP 16

No glare found

PV array 7 and OP 17

No glare found

PV array 7 and OP 18

No glare found

PV array 7 and OP 19

No glare found

PV array 7 and OP 20

No glare found

PV array 7 and OP 21

No glare found

PV array 7 and OP 22

No glare found

PV array 7 and OP 23

No glare found

PV array 7 and OP 24

No glare found

PV array 7 and OP 25

No glare found

PV array 7 and OP 26

No glare found

PV array 7 and OP 27

No glare found

PV array 7 and OP 28

No glare found

PV array 7 and OP 29

No glare found

PV array 7 and OP 30

No glare found

PV array 7 and OP 31

No glare found

PV array 7 and OP 32

No glare found

PV array 7 and OP 33

No glare found

PV array 7 and OP 34

No glare found

PV array 7 and OP 35

No glare found

PV array 7 and OP 36

No glare found

PV array 7 and OP 37

No glare found

PV array 7 and OP 38

No glare found

PV array 7 and OP 39

No glare found

PV array 7 and OP 40

No glare found

PV: PV array 8 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 8 and Route: Kooringaroo Road

No glare found

PV array 8 and Route: Windellama Road

No glare found

PV array 8 and FP: FP 1

No glare found

PV array 8 and FP: FP 2

No glare found

PV array 8 and OP 1

No glare found

PV array 8 and OP 2

No glare found

PV array 8 and OP 3

No glare found

PV array 8 and OP 4

No glare found

PV array 8 and OP 5

No glare found

PV array 8 and OP 6

No glare found

PV array 8 and OP 7

No glare found

PV array 8 and OP 8

No glare found

PV array 8 and OP 9

No glare found

PV array 8 and OP 10

No glare found

PV array 8 and OP 11

No glare found

PV array 8 and OP 12

No glare found

PV array 8 and OP 13

No glare found

PV array 8 and OP 14

No glare found

PV array 8 and OP 15

No glare found

PV array 8 and OP 16

No glare found

PV array 8 and OP 17

No glare found

PV array 8 and OP 18

No glare found

PV array 8 and OP 19

No glare found

PV array 8 and OP 20

No glare found

PV array 8 and OP 21

No glare found

PV array 8 and OP 22

No glare found

PV array 8 and OP 23

No glare found

PV array 8 and OP 24

No glare found

PV array 8 and OP 25

No glare found

PV array 8 and OP 26

No glare found

PV array 8 and OP 27

No glare found

PV array 8 and OP 28

No glare found

PV array 8 and OP 29

No glare found

PV array 8 and OP 30

No glare found

PV array 8 and OP 31

No glare found

PV array 8 and OP 32

No glare found

PV array 8 and OP 33

No glare found

PV array 8 and OP 34

No glare found

PV array 8 and OP 35

No glare found

PV array 8 and OP 36

No glare found

PV array 8 and OP 37

No glare found

PV array 8 and OP 38

No glare found

PV array 8 and OP 39

No glare found

PV array 8 and OP 40

No glare found

PV: PV array 9 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
Kooringaroo Road	0	0.0	0	0.0
Windellama Road	0	0.0	0	0.0
FP 1	0	0.0	0	0.0
FP 2	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0
OP 20	0	0.0	0	0.0
OP 21	0	0.0	0	0.0
OP 22	0	0.0	0	0.0
OP 23	0	0.0	0	0.0
OP 24	0	0.0	0	0.0
OP 25	0	0.0	0	0.0
OP 26	0	0.0	0	0.0
OP 27	0	0.0	0	0.0
OP 28	0	0.0	0	0.0
OP 29	0	0.0	0	0.0
OP 30	0	0.0	0	0.0
OP 31	0	0.0	0	0.0
OP 32	0	0.0	0	0.0
OP 33	0	0.0	0	0.0
OP 34	0	0.0	0	0.0
OP 35	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 36	0	0.0	0	0.0
OP 37	0	0.0	0	0.0
OP 38	0	0.0	0	0.0
OP 39	0	0.0	0	0.0
OP 40	0	0.0	0	0.0

PV array 9 and Route: Kooringaroo Road

No glare found

PV array 9 and Route: Windellama Road

No glare found

PV array 9 and FP: FP 1

No glare found

PV array 9 and FP: FP 2

No glare found

PV array 9 and OP 1

No glare found

PV array 9 and OP 2

No glare found

PV array 9 and OP 3

No glare found

PV array 9 and OP 4

No glare found

PV array 9 and OP 5

No glare found

PV array 9 and OP 6

No glare found

PV array 9 and OP 7

No glare found

PV array 9 and OP 8

No glare found

PV array 9 and OP 9

No glare found

PV array 9 and OP 10

No glare found

PV array 9 and OP 11

No glare found

PV array 9 and OP 12

No glare found

PV array 9 and OP 13

No glare found

PV array 9 and OP 14

No glare found

PV array 9 and OP 15

No glare found

PV array 9 and OP 16

No glare found

PV array 9 and OP 17

No glare found

PV array 9 and OP 18

No glare found

PV array 9 and OP 19

No glare found

PV array 9 and OP 20

No glare found

PV array 9 and OP 21

No glare found

PV array 9 and OP 22

No glare found

PV array 9 and OP 23

No glare found

PV array 9 and OP 24

No glare found

PV array 9 and OP 25

No glare found

PV array 9 and OP 26

No glare found

PV array 9 and OP 27

No glare found

PV array 9 and OP 28

No glare found

PV array 9 and OP 29

No glare found

PV array 9 and OP 30

No glare found

PV array 9 and OP 31

No glare found

PV array 9 and OP 32

No glare found

PV array 9 and OP 33

No glare found

PV array 9 and OP 34

No glare found

PV array 9 and OP 35

No glare found

PV array 9 and OP 36

No glare found

PV array 9 and OP 37

No glare found

PV array 9 and OP 38

No glare found

PV array 9 and OP 39

No glare found

PV array 9 and OP 40

No glare found

Assumptions

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

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

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

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FORGESOLAR GLARE ANALYSIS

Project: **2321 GUNDARY SOLAR FARM**
Site configuration: **2321 GUNDARY SF B**

Client: UMWELT

Created 04 Sep, 2023
Updated 05 Sep, 2023
Time-step 1 minute
Timezone offset UTC10
Minimum sun altitude 0.0 deg
DNI peaks at 1,000.0 W/m^2
Category 100 MW to 1 GW
Site ID 99384.15924

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

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 4	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 7	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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.

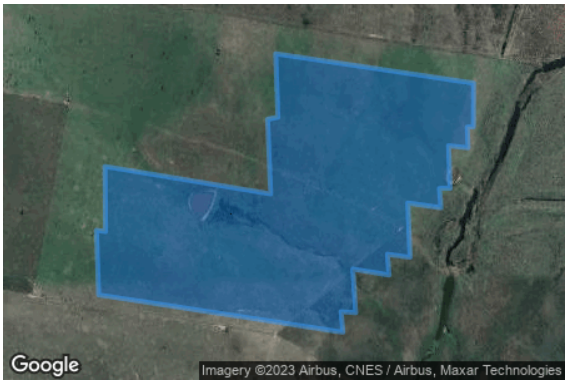
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

Component Data

PV Arrays

Name: PV array 1
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840456	149.755350	675.25	1.95	677.20
2	-34.840842	149.758197	672.75	1.95	674.70
3	-34.839794	149.758144	676.52	1.95	678.47
4	-34.839764	149.758322	676.87	1.95	678.82
5	-34.838872	149.758283	677.61	1.95	679.56
6	-34.839286	149.761683	652.30	1.95	654.25
7	-34.839897	149.761681	652.06	1.95	654.01
8	-34.839903	149.761575	653.51	1.95	655.46
9	-34.840194	149.761589	652.81	1.95	654.76
10	-34.840164	149.761253	656.23	1.95	658.18
11	-34.840764	149.761281	653.53	1.95	655.48
12	-34.840764	149.761097	654.88	1.95	656.83
13	-34.841036	149.761122	652.81	1.95	654.76
14	-34.840969	149.760553	656.86	1.95	658.81
15	-34.841733	149.760592	651.87	1.95	653.82
16	-34.841689	149.760203	655.00	1.95	656.95
17	-34.841981	149.760231	653.26	1.95	655.21
18	-34.841897	149.759608	659.68	1.95	661.63
19	-34.842511	149.759658	657.56	1.95	659.51
20	-34.842497	149.759408	659.19	1.95	661.14
21	-34.842786	149.759439	658.50	1.95	660.45
22	-34.842261	149.755242	679.24	1.95	681.19
23	-34.841353	149.755203	676.42	1.95	678.37
24	-34.841369	149.755361	676.81	1.95	678.76

Name: PV array 10
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.45
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858406	149.770000	655.09	1.95	657.04
2	-34.859275	149.776911	670.07	1.95	672.02
3	-34.858694	149.776881	667.72	1.95	669.67
4	-34.858422	149.777164	667.36	1.95	669.31
5	-34.858517	149.777869	669.53	1.95	671.48
6	-34.857853	149.777822	668.66	1.95	670.61
7	-34.857567	149.778106	669.19	1.95	671.14
8	-34.857733	149.779386	673.06	1.95	675.01
9	-34.858044	149.779392	674.91	1.95	676.86
10	-34.858317	149.781619	676.41	1.95	678.36
11	-34.859039	149.781789	677.78	1.95	679.73
12	-34.859308	149.781792	679.96	1.95	681.91
13	-34.859375	149.782231	679.89	1.95	681.84
14	-34.859536	149.782239	681.33	1.95	683.28
15	-34.859567	149.782506	681.61	1.95	683.56
16	-34.860022	149.782522	686.44	1.95	688.39
17	-34.860122	149.783111	688.43	1.95	690.38
18	-34.859500	149.783086	682.00	1.95	683.95
19	-34.859569	149.783803	683.21	1.95	685.16
20	-34.859289	149.783789	681.37	1.95	683.32
21	-34.859447	149.785550	682.53	1.95	684.48
22	-34.858550	149.785517	679.87	1.95	681.82
23	-34.858550	149.785744	680.18	1.95	682.13
24	-34.857958	149.785717	677.91	1.95	679.86
25	-34.858142	149.787292	680.38	1.95	682.33
26	-34.858758	149.787306	683.68	1.95	685.63
27	-34.858850	149.787914	683.32	1.95	685.27
28	-34.859147	149.787919	684.39	1.95	686.34
29	-34.859217	149.788481	683.00	1.95	684.95
30	-34.859839	149.788483	684.87	1.95	686.82
31	-34.859889	149.788428	685.10	1.95	687.05
32	-34.860054	149.788430	685.75	1.95	687.70
33	-34.860358	149.788434	687.01	1.95	688.96
34	-34.860727	149.788435	688.51	1.95	690.46
35	-34.861000	149.788452	689.51	1.95	691.46
36	-34.861206	149.788459	689.25	1.95	691.20
37	-34.861380	149.788465	689.05	1.95	691.00
38	-34.861585	149.788469	688.82	1.95	690.77
39	-34.861731	149.788458	689.04	1.95	690.99
40	-34.861660	149.787962	691.38	1.95	693.33
41	-34.861623	149.787682	693.41	1.95	695.36
42	-34.861578	149.787337	694.64	1.95	696.59
43	-34.861491	149.786699	694.22	1.95	696.17
44	-34.861439	149.786264	691.51	1.95	693.46
45	-34.861253	149.784794	688.21	1.95	690.16
46	-34.861211	149.784530	689.95	1.95	691.90
47	-34.861151	149.784191	691.97	1.95	693.92
48	-34.861125	149.784062	692.51	1.95	694.46
49	-34.861102	149.783899	693.26	1.95	695.21
50	-34.861085	149.783822	693.65	1.95	695.60
51	-34.861071	149.783685	694.25	1.95	696.20
52	-34.861043	149.783443	695.39	1.95	697.34
53	-34.859242	149.769586	655.35	1.95	657.30
54	-34.858619	149.769571	655.00	1.95	656.95
55	-34.858669	149.769994	655.22	1.95	657.17

Name: PV array 11
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854928	149.786786	682.51	1.95	684.46
2	-34.855153	149.788475	685.33	1.95	687.28
3	-34.855178	149.788637	684.59	1.95	686.54
4	-34.855197	149.788745	684.14	1.95	686.09
5	-34.855216	149.788878	683.68	1.95	685.63
6	-34.855257	149.789198	684.90	1.95	686.85
7	-34.855306	149.789552	687.26	1.95	689.21
8	-34.855581	149.791525	700.41	1.95	702.36
9	-34.854836	149.791494	701.31	1.95	703.26
10	-34.854864	149.791889	701.91	1.95	703.86
11	-34.854581	149.791869	701.25	1.95	703.20
12	-34.854628	149.792308	701.24	1.95	703.19
13	-34.854017	149.792292	699.50	1.95	701.45
14	-34.854047	149.792558	699.02	1.95	700.97
15	-34.853761	149.792550	699.97	1.95	701.92
16	-34.853831	149.793075	699.31	1.95	701.26
17	-34.854142	149.793086	698.06	1.95	700.01
18	-34.854433	149.795772	705.20	1.95	707.15
19	-34.855344	149.795817	705.80	1.95	707.75
20	-34.856011	149.795669	708.16	1.95	710.11
21	-34.856144	149.795500	709.31	1.95	711.26
22	-34.856744	149.795525	708.98	1.95	710.93
23	-34.856639	149.794693	710.56	1.95	712.51
24	-34.856929	149.794705	710.54	1.95	712.49
25	-34.856917	149.794600	710.75	1.95	712.70
26	-34.857533	149.794625	709.83	1.95	711.78
27	-34.857822	149.794578	709.08	1.95	711.03
28	-34.857867	149.794406	709.56	1.95	711.51
29	-34.858489	149.794442	706.20	1.95	708.15
30	-34.858772	149.794394	704.16	1.95	706.11
31	-34.858753	149.794222	704.23	1.95	706.18
32	-34.859358	149.794253	699.89	1.95	701.84
33	-34.859356	149.794136	699.89	1.95	701.84
34	-34.859644	149.794147	697.80	1.95	699.75
35	-34.859267	149.791322	687.69	1.95	689.64
36	-34.858947	149.791308	688.01	1.95	689.96
37	-34.858900	149.790925	685.57	1.95	687.52
38	-34.858286	149.790900	686.54	1.95	688.49
39	-34.858083	149.789519	683.80	1.95	685.75
40	-34.857792	149.789519	683.80	1.95	685.75
41	-34.857742	149.789139	683.25	1.95	685.20
42	-34.857125	149.789114	683.46	1.95	685.41
43	-34.857064	149.788703	682.21	1.95	684.16
44	-34.857678	149.788719	682.27	1.95	684.22
45	-34.857631	149.788367	681.25	1.95	683.20
46	-34.856964	149.788344	681.16	1.95	683.11
47	-34.856719	149.786636	678.00	1.95	679.95
48	-34.856106	149.786614	679.61	1.95	681.56
49	-34.855211	149.786697	681.71	1.95	683.66

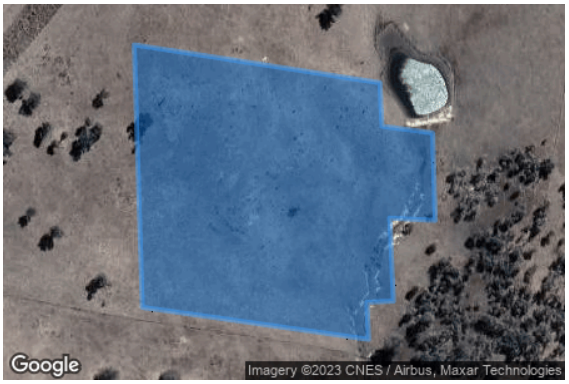
Name: PV array 12
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.859419	149.769711	655.67	1.95	657.62
2	-34.861188	149.783350	696.52	1.95	698.47
3	-34.861232	149.783715	695.09	1.95	697.04
4	-34.861282	149.784147	693.17	1.95	695.12
5	-34.861345	149.784637	689.71	1.95	691.66
6	-34.862506	149.793494	693.21	1.95	695.16
7	-34.863142	149.793542	694.26	1.95	696.21
8	-34.866122	149.792931	694.11	1.95	696.06
9	-34.865931	149.791367	702.04	1.95	703.99
10	-34.865333	149.791322	703.42	1.95	705.37
11	-34.865036	149.791375	703.20	1.95	705.15
12	-34.865019	149.791258	703.60	1.95	705.55
13	-34.864686	149.790997	703.23	1.95	705.18
14	-34.864553	149.789928	704.25	1.95	706.20
15	-34.863931	149.789911	701.83	1.95	703.78
16	-34.863808	149.789000	698.34	1.95	700.29
17	-34.864411	149.789019	700.24	1.95	702.19
18	-34.864303	149.788022	694.23	1.95	696.18
19	-34.864583	149.788039	694.66	1.95	696.61
20	-34.864439	149.786811	697.29	1.95	699.24
21	-34.865050	149.786856	697.08	1.95	699.03
22	-34.865314	149.786586	697.74	1.95	699.69
23	-34.865150	149.785300	694.98	1.95	696.93
24	-34.864858	149.785286	695.42	1.95	697.37
25	-34.864750	149.784472	695.43	1.95	697.38
26	-34.864730	149.784300	696.07	1.95	698.02
27	-34.864708	149.784110	696.73	1.95	698.68
28	-34.864983	149.784128	696.32	1.95	698.27
29	-34.864675	149.781517	703.05	1.95	705.00
30	-34.864367	149.781494	702.23	1.95	704.18
31	-34.864328	149.781228	700.18	1.95	702.13
32	-34.863703	149.781219	698.95	1.95	700.90
33	-34.863708	149.781372	700.44	1.95	702.39
34	-34.863419	149.781353	699.61	1.95	701.56
35	-34.863236	149.779844	691.61	1.95	693.56
36	-34.863519	149.779856	690.43	1.95	692.38
37	-34.863342	149.778442	682.56	1.95	684.51
38	-34.863936	149.778461	678.80	1.95	680.75
39	-34.863886	149.777744	674.62	1.95	676.57
40	-34.864161	149.777750	672.97	1.95	674.92
41	-34.864058	149.776792	667.31	1.95	669.26
42	-34.863769	149.776778	669.04	1.95	670.99
43	-34.863364	149.773750	660.53	1.95	662.48
44	-34.862753	149.773742	661.26	1.95	663.21
45	-34.862656	149.773025	660.60	1.95	662.55
46	-34.862372	149.773017	661.22	1.95	663.17
47	-34.862250	149.772294	661.76	1.95	663.71
48	-34.861636	149.772283	662.10	1.95	664.05
49	-34.861336	149.770414	657.93	1.95	659.88
50	-34.860978	149.770014	657.15	1.95	659.10
51	-34.860361	149.769983	656.71	1.95	658.66
52	-34.860352	149.769682	655.91	1.95	657.86

Name: PV array 13
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.866069	149.791139	701.41	1.95	703.36
2	-34.866275	149.792711	694.92	1.95	696.87
3	-34.867181	149.792725	694.34	1.95	696.29
4	-34.867058	149.791775	696.40	1.95	698.35
5	-34.866747	149.791756	697.15	1.95	699.10
6	-34.866678	149.791158	699.92	1.95	701.87

Name: PV array 14
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864939	149.782561	702.09	1.95	704.04
2	-34.865206	149.784672	693.63	1.95	695.58
3	-34.865511	149.784689	693.01	1.95	694.96
4	-34.865558	149.785125	694.61	1.95	696.56
5	-34.866172	149.785147	693.39	1.95	695.34
6	-34.866156	149.784756	690.39	1.95	692.34
7	-34.866739	149.784789	688.82	1.95	690.77
8	-34.866747	149.784561	687.86	1.95	689.81
9	-34.867008	149.784575	686.24	1.95	688.19
10	-34.866783	149.782631	699.00	1.95	700.95

Name: PV array 2
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.864660	149.778232	674.47	1.95	676.42
2	-34.864670	149.778331	675.34	1.95	677.29
3	-34.864680	149.778433	676.22	1.95	678.17
4	-34.864698	149.778569	677.49	1.95	679.44
5	-34.864713	149.778664	678.31	1.95	680.26
6	-34.864418	149.778643	677.80	1.95	679.75
7	-34.864425	149.778731	678.62	1.95	680.57
8	-34.865039	149.778767	680.03	1.95	681.98
9	-34.865042	149.778650	678.66	1.95	680.61
10	-34.865319	149.778669	678.68	1.95	680.63
11	-34.865292	149.778386	675.36	1.95	677.31
12	-34.865894	149.778403	674.05	1.95	676.00
13	-34.865903	149.778250	672.04	1.95	673.99
14	-34.866181	149.778256	670.94	1.95	672.89
15	-34.866158	149.778006	667.76	1.95	669.71
16	-34.865242	149.777983	670.58	1.95	672.53
17	-34.865254	149.778092	671.86	1.95	673.81
18	-34.864955	149.778101	672.70	1.95	674.65
19	-34.864652	149.778112	673.44	1.95	675.39

Name: PV array 3
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.861793	149.789000	688.70	1.95	690.65
2	-34.862401	149.793651	693.05	1.95	695.00
3	-34.862093	149.793694	691.55	1.95	693.50
4	-34.861472	149.793673	688.72	1.95	690.67
5	-34.861217	149.791758	688.32	1.95	690.27
6	-34.860601	149.791725	686.00	1.95	687.95
7	-34.860556	149.791328	687.34	1.95	689.29
8	-34.860266	149.791334	687.14	1.95	689.09
9	-34.860143	149.790352	686.29	1.95	688.24
10	-34.859460	149.790336	683.76	1.95	685.71
11	-34.859302	149.789038	683.43	1.95	685.38
12	-34.859945	149.788957	684.94	1.95	686.89

Name: PV array 4
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853669	149.787596	691.34	1.95	693.29
2	-34.854597	149.787623	689.26	1.95	691.21
3	-34.854562	149.787377	687.65	1.95	689.60
4	-34.853644	149.787352	689.28	1.95	691.23

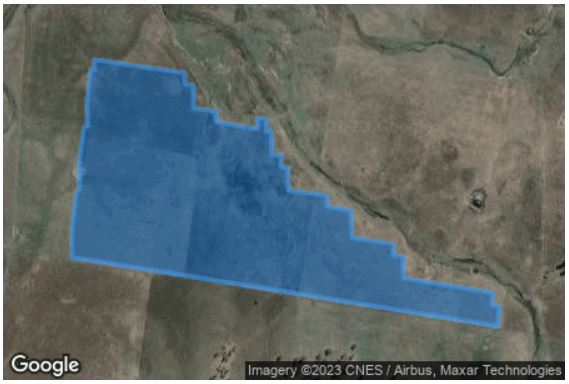
Name: PV array 5
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.854681	149.788294	689.54	1.95	691.49
2	-34.854657	149.788044	689.39	1.95	691.34
3	-34.854036	149.788026	692.11	1.95	694.06
4	-34.854010	149.787787	691.97	1.95	693.92
5	-34.853389	149.787776	691.87	1.95	693.82
6	-34.853464	149.788267	693.88	1.95	695.83

Name: PV array 6
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

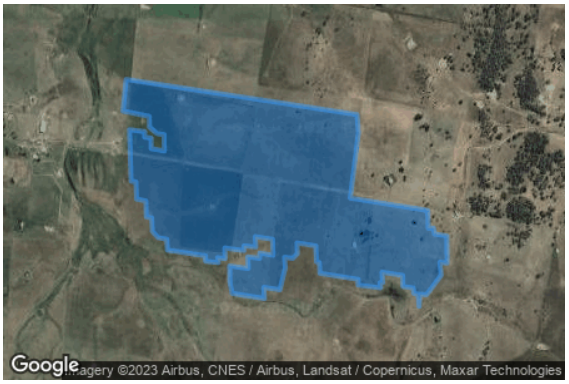
Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.853629	149.789463	692.51	1.95	694.46
2	-34.854545	149.789498	688.36	1.95	690.31
3	-34.854551	149.789619	688.95	1.95	690.90
4	-34.855170	149.789627	687.82	1.95	689.77
5	-34.855020	149.788506	686.04	1.95	687.99
6	-34.854078	149.788476	691.03	1.95	692.98
7	-34.854096	149.788651	689.99	1.95	691.94
8	-34.853515	149.788637	692.65	1.95	694.60

Name: PV array 7
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.858389	149.762044	654.78	1.95	656.73
2	-34.858763	149.765150	654.46	1.95	656.41
3	-34.859087	149.765169	655.94	1.95	657.89
4	-34.859107	149.765445	655.09	1.95	657.04
5	-34.859756	149.765464	657.08	1.95	659.03
6	-34.859846	149.766237	655.17	1.95	657.12
7	-34.860139	149.766237	655.26	1.95	657.21
8	-34.860337	149.767642	653.16	1.95	655.11
9	-34.860035	149.767650	652.68	1.95	654.63
10	-34.860060	149.767953	652.64	1.95	654.59
11	-34.860414	149.767951	653.24	1.95	655.19
12	-34.860401	149.768125	653.19	1.95	655.14
13	-34.861070	149.768155	654.66	1.95	656.61
14	-34.861072	149.768471	654.35	1.95	656.30
15	-34.861415	149.768471	655.30	1.95	657.25
16	-34.861426	149.768686	655.44	1.95	657.39
17	-34.862054	149.768715	656.53	1.95	658.48
18	-34.862219	149.770037	655.98	1.95	657.93
19	-34.862518	149.770054	657.26	1.95	659.21
20	-34.862624	149.770872	660.29	1.95	662.24
21	-34.863389	149.770896	664.47	1.95	666.42
22	-34.863570	149.772327	662.49	1.95	664.44
23	-34.863872	149.772327	664.38	1.95	666.33
24	-34.863916	149.772649	663.73	1.95	665.68
25	-34.864530	149.772662	667.21	1.95	669.16
26	-34.864941	149.775730	660.60	1.95	662.55
27	-34.865307	149.775709	661.69	1.95	663.64
28	-34.865324	149.775948	661.21	1.95	663.16
29	-34.865877	149.775910	664.14	1.95	666.09
30	-34.863949	149.761276	660.39	1.95	662.34
31	-34.863321	149.761262	658.42	1.95	660.37
32	-34.862142	149.761421	654.55	1.95	656.50
33	-34.862025	149.761536	654.61	1.95	656.56
34	-34.861411	149.761501	654.38	1.95	656.33
35	-34.860282	149.761686	655.50	1.95	657.45
36	-34.860234	149.761807	655.78	1.95	657.73
37	-34.859571	149.761793	654.80	1.95	656.75
38	-34.858667	149.761920	654.60	1.95	656.55
39	-34.858675	149.762038	654.78	1.95	656.73

Name: PV array 8
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.845411	149.763747	652.46	1.95	654.41
2	-34.847392	149.779619	707.21	1.95	709.16
3	-34.848408	149.779711	704.09	1.95	706.04
4	-34.852081	149.779147	685.99	1.95	687.94
5	-34.852786	149.784478	691.16	1.95	693.11
6	-34.853775	149.784508	691.71	1.95	693.66
7	-34.853775	149.784878	689.84	1.95	691.79
8	-34.854100	149.784925	690.53	1.95	692.48
9	-34.854219	149.785789	685.62	1.95	687.57
10	-34.855742	149.785800	682.29	1.95	684.24
11	-34.855683	149.785310	685.04	1.95	686.99
12	-34.856422	149.785389	681.50	1.95	683.45
13	-34.857511	149.784392	682.41	1.95	684.36
14	-34.857481	149.783917	687.18	1.95	689.13
15	-34.858167	149.783881	680.46	1.95	682.41
16	-34.857481	149.783808	688.31	1.95	690.26
17	-34.857436	149.783517	691.61	1.95	693.56
18	-34.857131	149.783481	694.73	1.95	696.68
19	-34.857050	149.782769	697.28	1.95	699.23
20	-34.856428	149.782753	702.34	1.95	704.29
21	-34.856247	149.781331	690.38	1.95	692.33
22	-34.856842	149.781372	686.61	1.95	688.56
23	-34.856842	149.781181	684.12	1.95	686.07
24	-34.857128	149.781225	681.30	1.95	683.25
25	-34.856967	149.779683	671.16	1.95	673.11
26	-34.856650	149.779697	671.81	1.95	673.76
27	-34.856311	149.777061	674.88	1.95	676.83
28	-34.855703	149.777025	677.46	1.95	679.41
29	-34.855667	149.776828	677.06	1.95	679.01
30	-34.854769	149.776781	677.81	1.95	679.76
31	-34.854597	149.775486	674.67	1.95	676.62
32	-34.855203	149.775514	675.51	1.95	677.46
33	-34.855472	149.775192	675.81	1.95	677.76
34	-34.855406	149.774631	673.87	1.95	675.82
35	-34.856003	149.774686	674.26	1.95	676.21
36	-34.857236	149.774311	667.81	1.95	669.76
37	-34.857097	149.773200	666.06	1.95	668.01
38	-34.857725	149.773250	663.66	1.95	665.61
39	-34.857439	149.771031	657.32	1.95	659.27
40	-34.856844	149.770881	658.78	1.95	660.73
41	-34.855897	149.770853	661.80	1.95	663.75
42	-34.856044	149.772136	665.70	1.95	667.65
43	-34.855386	149.772106	666.67	1.95	668.62
44	-34.855475	149.772917	667.66	1.95	669.61
45	-34.855178	149.772928	667.97	1.95	669.92
46	-34.855297	149.773847	670.37	1.95	672.32
47	-34.854400	149.773822	667.85	1.95	669.80
48	-34.854247	149.772617	670.96	1.95	672.91
49	-34.854831	149.772658	668.72	1.95	670.67
50	-34.854761	149.771839	667.26	1.95	669.21
51	-34.855033	149.771839	666.77	1.95	668.72
52	-34.854889	149.770528	663.03	1.95	664.98
53	-34.855489	149.770544	662.17	1.95	664.12
54	-34.855433	149.770022	661.56	1.95	663.51
55	-34.855714	149.770078	660.72	1.95	662.67
56	-34.855625	149.769203	659.64	1.95	661.59
57	-34.855331	149.769208	660.52	1.95	662.47
58	-34.855006	149.766578	654.49	1.95	656.44
59	-34.854394	149.766550	657.29	1.95	659.24

Name: PV array 9
Axis tracking: Single-axis rotation
Backtracking: Shade-slope
Tracking axis orientation: 0.0°
Max tracking angle: 60.0°
Resting angle: 22.0°
Ground Coverage Ratio: 0.47
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-34.840718	149.772712	672.26	1.95	674.21
2	-34.840814	149.773442	671.97	1.95	673.92
3	-34.841456	149.773456	675.07	1.95	677.02
4	-34.841747	149.773419	676.57	1.95	678.52
5	-34.841731	149.773314	676.64	1.95	678.59
6	-34.842339	149.773342	678.44	1.95	680.39
7	-34.842631	149.773217	678.20	1.95	680.15
8	-34.842756	149.773061	677.22	1.95	679.17
9	-34.843378	149.773086	674.65	1.95	676.60
10	-34.843647	149.773042	673.22	1.95	675.17
11	-34.843625	149.772867	672.64	1.95	674.59
12	-34.844278	149.772897	670.46	1.95	672.41
13	-34.844536	149.772847	669.57	1.95	671.52
14	-34.844522	149.772678	668.82	1.95	670.77
15	-34.845225	149.772706	668.61	1.95	670.56
16	-34.845481	149.772669	668.60	1.95	670.55
17	-34.845486	149.772600	668.15	1.95	670.10
18	-34.846100	149.772636	668.91	1.95	670.86
19	-34.846103	149.772514	668.39	1.95	670.34
20	-34.846381	149.772536	668.80	1.95	670.75
21	-34.845264	149.763456	651.54	1.95	653.49
22	-34.844958	149.763439	651.17	1.95	653.12
23	-34.844922	149.763219	650.29	1.95	652.24
24	-34.843692	149.763178	648.91	1.95	650.86
25	-34.844175	149.766897	654.86	1.95	656.81
26	-34.844772	149.766933	655.27	1.95	657.22
27	-34.845303	149.771283	663.76	1.95	665.71
28	-34.844328	149.771242	664.76	1.95	666.71
29	-34.843819	149.767178	655.00	1.95	656.95
30	-34.843528	149.767169	655.11	1.95	657.06
31	-34.843097	149.763747	648.51	1.95	650.46
32	-34.842475	149.763756	648.01	1.95	649.96
33	-34.842494	149.764075	648.08	1.95	650.03
34	-34.841894	149.764058	648.00	1.95	649.95
35	-34.841903	149.764161	648.00	1.95	649.95
36	-34.841614	149.764144	647.51	1.95	649.46
37	-34.841956	149.767048	654.66	1.95	656.61
38	-34.840915	149.767103	652.33	1.95	654.28
39	-34.840928	149.767232	652.75	1.95	654.70
40	-34.840081	149.767326	653.68	1.95	655.63
41	-34.840302	149.769306	665.37	1.95	667.32
42	-34.840380	149.769919	668.21	1.95	670.16
43	-34.840484	149.770793	669.07	1.95	671.02
44	-34.840569	149.771476	669.92	1.95	671.87

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-34.877248	149.733392	676.66	1.50
OP 2	2	-34.877736	149.736530	672.74	1.50
OP 3	3	-34.816270	149.774945	687.63	1.50
OP 4	4	-34.832221	149.795595	702.10	1.50
OP 5	5	-34.823917	149.794925	718.02	1.50
OP 6	6	-34.840652	149.799444	693.75	1.50
OP 7	7	-34.843100	149.800098	697.95	1.50
OP 8	8	-34.851934	149.795258	724.54	1.50
OP 9	9	-34.849279	149.798495	704.99	1.50
OP 10	10	-34.869064	149.811292	736.59	1.50
OP 11	11	-34.819425	149.738225	650.78	1.50
OP 12	12	-34.852672	149.736507	690.02	1.50
OP 13	13	-34.832789	149.743150	678.73	1.50
OP 14	14	-34.846924	149.730615	690.46	1.50
OP 15	15	-34.839542	149.807660	737.64	1.50
OP 16	16	-34.806698	149.734245	636.07	1.50
OP 17	17	-34.807504	149.733532	638.67	1.50

Glare Analysis Results

Summary of Results No glare predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV array 1	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 10	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 11	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 12	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 13	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 14	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 2	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 3	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 4	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 5	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 6	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 7	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 8	SA tracking	SA tracking	0	0.0	0	0.0	-
PV array 9	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
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV: PV array 1 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 1 and OP 1

No glare found

PV array 1 and OP 2

No glare found

PV array 1 and OP 3

No glare found

PV array 1 and OP 4

No glare found

PV array 1 and OP 5

No glare found

PV array 1 and OP 6

No glare found

PV array 1 and OP 7

No glare found

PV array 1 and OP 8

No glare found

PV array 1 and OP 9

No glare found

PV array 1 and OP 10

No glare found

PV array 1 and OP 11

No glare found

PV array 1 and OP 12

No glare found

PV array 1 and OP 13

No glare found

PV array 1 and OP 14

No glare found

PV array 1 and OP 15

No glare found

PV array 1 and OP 16

No glare found

PV array 1 and OP 17

No glare found

PV: PV array 10 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 10 and OP 1

No glare found

PV array 10 and OP 2

No glare found

PV array 10 and OP 3

No glare found

PV array 10 and OP 4

No glare found

PV array 10 and OP 5

No glare found

PV array 10 and OP 6

No glare found

PV array 10 and OP 7

No glare found

PV array 10 and OP 8

No glare found

PV array 10 and OP 9

No glare found

PV array 10 and OP 10

No glare found

PV array 10 and OP 11

No glare found

PV array 10 and OP 12

No glare found

PV array 10 and OP 13

No glare found

PV array 10 and OP 14

No glare found

PV array 10 and OP 15

No glare found

PV array 10 and OP 16

No glare found

PV array 10 and OP 17

No glare found

PV: PV array 11 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 11 and OP 1

No glare found

PV array 11 and OP 2

No glare found

PV array 11 and OP 3

No glare found

PV array 11 and OP 4

No glare found

PV array 11 and OP 5

No glare found

PV array 11 and OP 6

No glare found

PV array 11 and OP 7

No glare found

PV array 11 and OP 8

No glare found

PV array 11 and OP 9

No glare found

PV array 11 and OP 10

No glare found

PV array 11 and OP 11

No glare found

PV array 11 and OP 12

No glare found

PV array 11 and OP 13

No glare found

PV array 11 and OP 14

No glare found

PV array 11 and OP 15

No glare found

PV array 11 and OP 16

No glare found

PV array 11 and OP 17

No glare found

PV: PV array 12 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 12 and OP 1

No glare found

PV array 12 and OP 2

No glare found

PV array 12 and OP 3

No glare found

PV array 12 and OP 4

No glare found

PV array 12 and OP 5

No glare found

PV array 12 and OP 6

No glare found

PV array 12 and OP 7

No glare found

PV array 12 and OP 8

No glare found

PV array 12 and OP 9

No glare found

PV array 12 and OP 10

No glare found

PV array 12 and OP 11

No glare found

PV array 12 and OP 12

No glare found

PV array 12 and OP 13

No glare found

PV array 12 and OP 14

No glare found

PV array 12 and OP 15

No glare found

PV array 12 and OP 16

No glare found

PV array 12 and OP 17

No glare found

PV: PV array 13 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 13 and OP 1

No glare found

PV array 13 and OP 2

No glare found

PV array 13 and OP 3

No glare found

PV array 13 and OP 4

No glare found

PV array 13 and OP 5

No glare found

PV array 13 and OP 6

No glare found

PV array 13 and OP 7

No glare found

PV array 13 and OP 8

No glare found

PV array 13 and OP 9

No glare found

PV array 13 and OP 10

No glare found

PV array 13 and OP 11

No glare found

PV array 13 and OP 12

No glare found

PV array 13 and OP 13

No glare found

PV array 13 and OP 14

No glare found

PV array 13 and OP 15

No glare found

PV array 13 and OP 16

No glare found

PV array 13 and OP 17

No glare found

PV: PV array 14 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 14 and OP 1

No glare found

PV array 14 and OP 2

No glare found

PV array 14 and OP 3

No glare found

PV array 14 and OP 4

No glare found

PV array 14 and OP 5

No glare found

PV array 14 and OP 6

No glare found

PV array 14 and OP 7

No glare found

PV array 14 and OP 8

No glare found

PV array 14 and OP 9

No glare found

PV array 14 and OP 10

No glare found

PV array 14 and OP 11

No glare found

PV array 14 and OP 12

No glare found

PV array 14 and OP 13

No glare found

PV array 14 and OP 14

No glare found

PV array 14 and OP 15

No glare found

PV array 14 and OP 16

No glare found

PV array 14 and OP 17

No glare found

PV: PV array 2 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 2 and OP 1

No glare found

PV array 2 and OP 2

No glare found

PV array 2 and OP 3

No glare found

PV array 2 and OP 4

No glare found

PV array 2 and OP 5

No glare found

PV array 2 and OP 6

No glare found

PV array 2 and OP 7

No glare found

PV array 2 and OP 8

No glare found

PV array 2 and OP 9

No glare found

PV array 2 and OP 10

No glare found

PV array 2 and OP 11

No glare found

PV array 2 and OP 12

No glare found

PV array 2 and OP 13

No glare found

PV array 2 and OP 14

No glare found

PV array 2 and OP 15

No glare found

PV array 2 and OP 16

No glare found

PV array 2 and OP 17

No glare found

PV: PV array 3 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 3 and OP 1

No glare found

PV array 3 and OP 2

No glare found

PV array 3 and OP 3

No glare found

PV array 3 and OP 4

No glare found

PV array 3 and OP 5

No glare found

PV array 3 and OP 6

No glare found

PV array 3 and OP 7

No glare found

PV array 3 and OP 8

No glare found

PV array 3 and OP 9

No glare found

PV array 3 and OP 10

No glare found

PV array 3 and OP 11

No glare found

PV array 3 and OP 12

No glare found

PV array 3 and OP 13

No glare found

PV array 3 and OP 14

No glare found

PV array 3 and OP 15

No glare found

PV array 3 and OP 16

No glare found

PV array 3 and OP 17

No glare found

PV: PV array 4 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 4 and OP 1

No glare found

PV array 4 and OP 2

No glare found

PV array 4 and OP 3

No glare found

PV array 4 and OP 4

No glare found

PV array 4 and OP 5

No glare found

PV array 4 and OP 6

No glare found

PV array 4 and OP 7

No glare found

PV array 4 and OP 8

No glare found

PV array 4 and OP 9

No glare found

PV array 4 and OP 10

No glare found

PV array 4 and OP 11

No glare found

PV array 4 and OP 12

No glare found

PV array 4 and OP 13

No glare found

PV array 4 and OP 14

No glare found

PV array 4 and OP 15

No glare found

PV array 4 and OP 16

No glare found

PV array 4 and OP 17

No glare found

PV: PV array 5 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 5 and OP 1

No glare found

PV array 5 and OP 2

No glare found

PV array 5 and OP 3

No glare found

PV array 5 and OP 4

No glare found

PV array 5 and OP 5

No glare found

PV array 5 and OP 6

No glare found

PV array 5 and OP 7

No glare found

PV array 5 and OP 8

No glare found

PV array 5 and OP 9

No glare found

PV array 5 and OP 10

No glare found

PV array 5 and OP 11

No glare found

PV array 5 and OP 12

No glare found

PV array 5 and OP 13

No glare found

PV array 5 and OP 14

No glare found

PV array 5 and OP 15

No glare found

PV array 5 and OP 16

No glare found

PV array 5 and OP 17

No glare found

PV: PV array 6 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 6 and OP 1

No glare found

PV array 6 and OP 2

No glare found

PV array 6 and OP 3

No glare found

PV array 6 and OP 4

No glare found

PV array 6 and OP 5

No glare found

PV array 6 and OP 6

No glare found

PV array 6 and OP 7

No glare found

PV array 6 and OP 8

No glare found

PV array 6 and OP 9

No glare found

PV array 6 and OP 10

No glare found

PV array 6 and OP 11

No glare found

PV array 6 and OP 12

No glare found

PV array 6 and OP 13

No glare found

PV array 6 and OP 14

No glare found

PV array 6 and OP 15

No glare found

PV array 6 and OP 16

No glare found

PV array 6 and OP 17

No glare found

PV: PV array 7 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 7 and OP 1

No glare found

PV array 7 and OP 2

No glare found

PV array 7 and OP 3

No glare found

PV array 7 and OP 4

No glare found

PV array 7 and OP 5

No glare found

PV array 7 and OP 6

No glare found

PV array 7 and OP 7

No glare found

PV array 7 and OP 8

No glare found

PV array 7 and OP 9

No glare found

PV array 7 and OP 10

No glare found

PV array 7 and OP 11

No glare found

PV array 7 and OP 12

No glare found

PV array 7 and OP 13

No glare found

PV array 7 and OP 14

No glare found

PV array 7 and OP 15

No glare found

PV array 7 and OP 16

No glare found

PV array 7 and OP 17

No glare found

PV: PV array 8 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 8 and OP 1

No glare found

PV array 8 and OP 2

No glare found

PV array 8 and OP 3

No glare found

PV array 8 and OP 4

No glare found

PV array 8 and OP 5

No glare found

PV array 8 and OP 6

No glare found

PV array 8 and OP 7

No glare found

PV array 8 and OP 8

No glare found

PV array 8 and OP 9

No glare found

PV array 8 and OP 10

No glare found

PV array 8 and OP 11

No glare found

PV array 8 and OP 12

No glare found

PV array 8 and OP 13

No glare found

PV array 8 and OP 14

No glare found

PV array 8 and OP 15

No glare found

PV array 8 and OP 16

No glare found

PV array 8 and OP 17

No glare found

PV: PV array 9 no glare found

Receptor results ordered by category of glare

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	0	0.0
OP 7	0	0.0	0	0.0
OP 8	0	0.0	0	0.0
OP 9	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0

PV array 9 and OP 1

No glare found

PV array 9 and OP 2

No glare found

PV array 9 and OP 3

No glare found

PV array 9 and OP 4

No glare found

PV array 9 and OP 5

No glare found

PV array 9 and OP 6

No glare found

PV array 9 and OP 7

No glare found

PV array 9 and OP 8

No glare found

PV array 9 and OP 9

No glare found

PV array 9 and OP 10

No glare found

PV array 9 and OP 11

No glare found

PV array 9 and OP 12

No glare found

PV array 9 and OP 13

No glare found

PV array 9 and OP 14

No glare found

PV array 9 and OP 15

No glare found

PV array 9 and OP 16

No glare found

PV array 9 and OP 17

No glare found

Assumptions

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

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

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

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Appendix E

Dwelling Entitlement Impact Assessment

Appendix E - Dwelling Entitlement Impact Assessment

A dwelling entitlement impact assessment was undertaken for the Gundary Solar Farm in line with the Large-scale Solar Guideline, to consider whether the Project will impact the right of neighbouring landholders to development their land for purposes of residential accommodation, tourist and visitor accommodation or an eco-tourist facility. The Large-scale Solar Guideline requires that impacts are considered on vacant land that would either:

- Immediately adjoin the Project, or
- Experience exceedances of the relevant noise criteria.

Based on the above, ten lots were identified (i.e. DE1 to DE10), as shown in **Figure E1.1**, for the assessment of potential impacts to development rights. Six of these lots (i.e. DE3 to DE8) form part of the Rosedale subdivision. Dwellings to potentially be developed as part of the Rosedale subdivision has been identified as potential future dwellings (also referred to as future receivers (FRs)), as shown on **Figure E1.1**.

Additional visual assessment was undertaken by Envisage Consulting to inform the dwelling entitlement impact assessment and has been included in **Appendix A** of the RFI Response, with the key findings summarised in **Table E1.1.**

In short, the visual assessment comprised the following:

- Visibility mapping prepared for all lots as per the Large-scale Solar Guideline.
- Additional bare earth renders (BERs) prepared for DE3 to DE8 (lots within Rosedale subdivision). It is noted that the location of the future dwellings, as shown in **Figure E1.1**, were based on the nominated Effluent Management Areas (EMAs) under DA/0568/2004. Importantly, these EMA locations are indicative and the conditions of DA/0568/2004 (as modified) do not prevent an alternative location being approved as part of a future development application for a dwelling, provided that an EMA can be appropriately sited in that alternative location, having regard to key site constraints (such as proximity to watercourses). It is noted that the Large-Scale Solar Guideline and its Technical Supplement for Landscape Character and Visual Impact Assessment do not specify how to categorise the viewpoint sensitivity for when there is no dwelling present, however, in this case the viewpoint sensitivity applied was 'moderate' based on what applies to a private receiver with a primary view, representing a 'worst case' viewpoint sensitivity for those six lots. This was based on advice from DPHI.

Table Error! No text of specified style in document.**E1.1** **Potential impacts to development rights of neighbouring landholders**

Receiver number	Impacts	Evaluation
DE1	• The lot is approximately 9 ha. It is zoned RU1 Primary Production, relatively flat and has mostly been cleared of vegetation. The lot is largely unconstrained and could support a dwelling over much of its extent. • The lot is located immediately south-west of the Project, and approximately 70 m from the nearest proposed infrastructure (the substation) but approximately 420 m away from its furthest point. • Visibility mapping[1] (refer to the additional visual assessment provided in **Appendix A** of the RFI Response) illustrates that the majority of the lot (i.e. 8.6 ha) will be able to view 1-25% of the Project, with 0.4 ha having 50-75% visibility of the Project. • The lot is partially located within the 35 dB operational noise contour, with approximately 2.5 ha of the lot not experiencing exceedances of the noise criteria.	• Landscape screening proposed as part of the EIS will minimise the visual impact on the subject lot. This will involve vegetation screening along the southern boundary of the Project, between the subject lot and the substation, as well as vegetation screening along the perimeter of the substation itself, located within the site. • The lot contains sufficient space (approximately 2.5 ha) on a relatively flat area towards the south which is outside the noise criteria and with views away from the Project such that a dwelling could be located or orientated to avoid significant noise and visual impacts. • The Project is not expected to significantly impact the ability of the land to be developed in future.
DE2	• The lot is approximately 66 ha. It is zoned RU1 Primary Production, relatively flat and has been mostly cleared of vegetation with a few rows of trees. • The lot is pastoral in nature and contains a number of farm dams and structures (such as sheds and farming facilities) as well as a number of creek lines traversing through. • The lot is on the eastern boundary of the Project, and approximately 20 m from the nearest proposed infrastructure (solar panels) but approximately 880 m away from its furthest point.	• Considering existing constraints within the lot, there is sufficient space (approximately 10 ha) on a relatively flat area towards the east of the lot that would be outside the noise criteria and with views away from the Project such that a dwelling could be located or orientated to avoid significant noise and visual impacts. • Existing vegetation (i.e. trees within the lot, and patches of remnant vegetation within the Project towards the southeast corner) would provide some screening. • The Project is not expected to significantly impact the ability of the land to be developed in future.

[1] Visibility mapping represents a bare ground scenario and does not consider intervening elements such as vegetation and structures.

Receiver number	Impacts	Evaluation
	• All parts of the lot will have 1-25% visibility of the Project. There would be no elevated views of the Project as the lot is low-lying. • The lot is partially located within the 35 dB operational noise contour, with approximately 39 ha of the lot not experiencing noise exceedances.	
DE3	• This lot is part of the Rosedale subdivision and is approximately 69 ha. The future dwelling is identified as FR3 on **Figure E1.1**. • The lot is towards the southwest of the Project but does not directly adjoin the Project. The nearest proposed infrastructure (solar panels) is about 180 m away and approximately 1.2 km away from its furthest point. • The lot is pastoral in nature, with some farm dams and gentle slopes on the west away from the Project. The eastern half of the lot is constrained due to Quialigo Creek and its tributaries traversing through. • There are areas to the west and south of the lot (approximately 3 ha in total) where a future dwelling can be located with no views of the Project. However, some of these are constraints in terms of waterways. • A Bare Earth Render (BER) prepared for this lot shows that a dwelling sited at FR3 (on the highest point of the lot) would have a low visual impact rating. • A small part of the lot is within the 35 dB operational noise contour, with approximately 62 ha of the lot not experiencing noise exceedances. FR3 is located outside the noise criteria.	• Should a dwelling be located at FR3, the visual impact is expected to be low with no noise exceedances predicted. • Considering site constraints, there is approximately 1.5 ha along the west of the lot boundary on a relatively flat area where FR3 to be located to avoid noise and visual impacts. • The Project is not expected to significantly impact the ability of the land to be developed in future.
DE4	• This lot is part of the Rosedale subdivision and is approximately 39 ha. The future dwelling is identified as FR6 on **Figure E1.1**.	• Should a dwelling be located at FR6, the visual impact is expected to be low with no noise exceedances predicted.

Receiver number	Impacts	Evaluation
	• The lot adjoins the southern boundary of the Project, with the nearest proposed infrastructure (solar panels) about 20 m away and approximately 870 m away from its furthest point. • The lot is pastoral in nature, with some farm dams and gently sloping. A few minor creek lines are present along the southern parts of the lot. • There is no part of the lot that would not see some of the Project, with 5.5 ha (13.8%) having views of between 1-25% of the Project. Additionally, the BER for this lot shows that a dwelling sited at FR6 would have a low visual impact rating. • The lot is partially within the 35 dB operational noise contour, with over 50% (25 ha) of the lot not experiencing noise exceedances. FR6 is located outside the noise criteria.	• Considering the site constraints, there is approximately 4 ha of the lot on a relatively flat area outside the noise criteria and with limited views (less than 25% of the Project) such that FR6 could be located to avoid significant noise and visual impacts. • The Project is not expected to significantly impact the ability of the land to be developed in future.
DE5	• This lot is part of the Rosedale subdivision and is approximately 41.5 ha. The future dwelling is identified as FR7 on **Figure E1.1**. • The lot adjoins the southern boundary of the Project, with the nearest proposed infrastructure (solar panels) about 20 m away and approximately 870 m away from its furthest point. • The lot is pastoral in nature, with some farm dams and gentle slopes. A substantial number of trees are present on site with some creek lines along the southern parts of the lot. • Approximately 13.7 ha of the lot towards to the south would have no visibility of the Project. • The BER for this lot shows that a dwelling sited at FR7 (the highest point) would have a moderate visual impact rating. The lot contains a substantial number of trees and it is	• A moderate visual impact and noise exceedances between 35 dB and 40 dB are predicted for a future dwelling at FR7. • Considering the site constraints, there is sufficient space towards the south of the lot (over 4 ha) that would be outside the noise criteria and with no views to the Project such that a dwelling could be located to avoid noise and visual impacts. This part of the lot has a gentle incline (~ 5 % slope) towards the east. • Existing vegetation within the lot would provide screening. • The Project is not expected to significantly impact the ability of the land to be developed in future.

Receiver number	Impacts	Evaluation
	likely that those trees would reduce the visual impact rating from location FR7. • The lot is partially within the 35 dB operational noise contour, with about 50% (21 ha) of the lot not experiencing noise exceedances. FR7 is located within the 35 dB to 40 dB noise contours.	
DE6	• This lot is part of the Rosedale subdivision and is approximately 42.5 ha. The future dwelling is identified as FR12 on **Figure E1.1**. • The lot adjoins the southern boundary of the Project, with the nearest proposed infrastructure (solar panels) about 20 m away and approximately 870 m away from its furthest point. • The lot is pastoral in nature, with a substantial number of trees present and some creek lines traversing through the southeastern parts of the lot. • About 1 ha along the western boundary of the lot would not have any visibility of the Project. It is noted that the BER for this lot shows that a dwelling sited at FR12 would have a high visual impact rating. Existing vegetation within the lot would provide screening and reduce this visual impact. • The lot is partially within the 35 dB operational noise contour, with about 13 ha of the lot not experiencing noise exceedances. FR12 is located within the 40 dB noise contour.	• A high visual impact and noise exceedances over 40 dB are predicted for a future dwelling at FR12. • Considering the existing constraints within the lot, there is approximately 0.4 ha to the west of the lot that would be outside the noise criteria and with no visibility of the Project such that a dwelling could be located to avoid significant noise and visual impacts. This part of the lot has a moderate incline (~ 20 % slope) towards the east. • Additionally, there is approximately 5 ha along the southwest of the lot with relatively flat areas that would be outside the noise criteria with 1-25% visibility of the Project. • Existing vegetation within the lot would provide additional screening. • The Project is not expected to significantly impact the ability of the land to be developed in future.
DE7	• This lot is part of the Rosedale subdivision and is approximately 52 ha. The future dwelling is identified as FR13 on **Figure E1.1**. • The lot adjoins the southern boundary of the Project, with the nearest proposed infrastructure (solar panels) about	• A moderate visual impact is predicted for FR13 with no noise exceedance. • Considering the existing site constraints within the lot, there is approximately 10 ha towards the south and southeast of the lot that would be outside the noise

Receiver number	Impacts	Evaluation
	20 m away and approximately 870 m away from its furthest point. • The lot is pastoral in nature, with some farm dams and a few trees towards the northeastern corner. The central part of the lot is constrained by Bullamalito Creek traversing through. • Visibility mapping shows that whilst there are no parts of the lot would have 0 % visibility of the Project, about 64 % (34 ha) would see no more than 25 % of the Project. The BER for this lot shows that a dwelling sited at FR13 (on the highest point of the lot) would have a moderate visual impact rating. It is noted that solar panels within this part of the site is set back from the Project boundary and existing vegetation within the Project Area would be retained as part of the Project. • The lot is partially within the 35 dB operational noise contour, with about 50 % (25 ha) of the lot not experiencing noise exceedances. FR13 is located outside the noise criteria.	criteria and with 1-25% visibility of the Project. There is sufficient space for a dwelling to be located or orientated to avoid significant noise and visual impacts. These areas are undulating in nature with the relatively flat areas towards the southeastern parts of the lot. • Furthermore, existing vegetation within the Project Area would provide some screening. • The Project is not expected to significantly impact the ability of the land to be developed in future.
DE8	• This lot is part of the Rosedale subdivision and is approximately 60.5 ha. The future dwelling is identified as FR14 on **Figure E1.1**. • The lot adjoins the southern boundary of the Project, with the nearest proposed infrastructure (solar panels) about 20 m away and approximately 770 m away from its furthest point. • The lot is pastoral in nature, with trees present along the northern boundary and some creek lines traversing through the central parts of the lot. • Whilst all of the lot would see between 1-25 % of the Project, views towards the Project would not be as elevated as most other lots due to the fact that the lot is	• A low visual impact is predicted for FR14 with no noise exceedances. • Considering the existing site constraints, there is approximately 18.5 ha along the southern parts of the lot within gentle sloped areas that would be outside the noise criteria and with 1-25% visibility of the Project. There is sufficient space for a dwelling to be located or orientated to avoid significant noise and visual impacts. • Furthermore, existing vegetation within the lot and the Project Area would provide some screening. • The Project is not expected to significantly impact the ability of the land to be developed in future.

Receiver number	Impacts	Evaluation
	low-laying. Additionally, the BER for this lot shows that a dwelling sited at FR14 would have a low visual impact rating. • The lot is partially within the 35 dB operational noise contour, with about 50 % (29.5 ha) of the lot not experiencing noise exceedances. FR14 is located outside the noise criteria.	
DE9	• The lot is approximately 20 ha in size. It is zoned RU1 Primary Production, relatively flat with a few rows of trees. • The lot is pastoral in nature, containing a number of large farm dams and some minor creek lines. • The lot does not directly adjoin the Project and is approximately 310 m from the nearest proposed infrastructure (solar panels) but approximately 800 m away from its furthest point. • Approximately 2.4 ha within the centre of the lot would have no views of the Project, with the remainder of the lot having 1-25% visibility. • The lot is partially located within the 35 dB operational noise contour, with approximately 13.6 ha of the lot outside the noise criteria.	• Considering the existing constrains within the lot, there remains approximately 1 ha that is relatively flat within the centre of the lot would be outside the noise criteria and with 0% visibility of the Project. Additional, approximately 6 ha on the south and southeast of the lot will be outside the noise criteria with 1-25% visibility of the Project. There is therefore sufficient space within the lot such that a dwelling could be located or orientated to avoid significant noise and visual impacts. • Additionally, existing vegetation would provide screening further reducing the visibility of the Project. • The Project is not expected to significantly impact the ability of the land to be developed in future.
DE10	• Lot size is approximately 30 ha. It is zoned RU1 Primary Production, relatively flat and cleared of vegetation with only a few trees remaining. • The lot is pastoral in nature and contains two farm dams and a number of minor creek lines. • The lot is directly southeast of the Project and approximately 60 m from the nearest proposed infrastructure (solar panels) but approximately 970 m away from its furthest point.	• Considering the site constraints, there remains approximately 1 ha that is relatively flat within the south and east of the lot outside the noise criteria and with 0% visibility of the Project. Additionally, approximately 6.5 ha on the east of the lot will be outside the noise criteria with 1-25% visibility of the Project. There is therefore sufficient space within the lot such that a dwelling could be located or orientated to avoid significant noise and visual impacts.

Receiver number	Impacts	Evaluation
	• Approximately 1 ha within the south and east of the lot would have no views of the Project with the remainder of the lot having 1-25% visibility of the Project. • The lot is partially located within the 35 dB operational noise contour, with approximately 14.5 ha of the lot not experiencing noise exceedances.	• Additionally, existing vegetation would provide screening further reducing the visibility of the Project. • The Project is not expected to significantly impact the ability of the land to be developed in future.

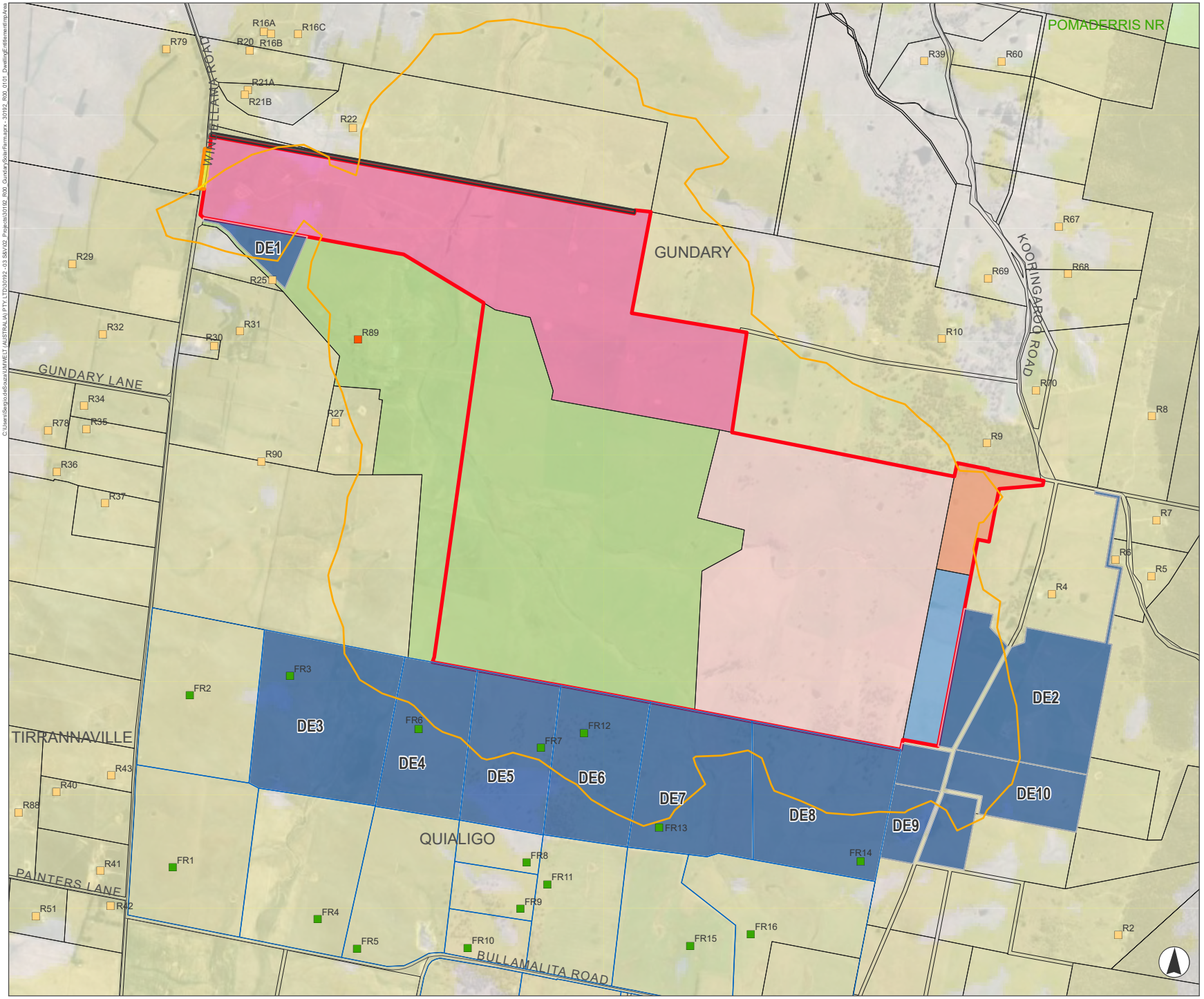
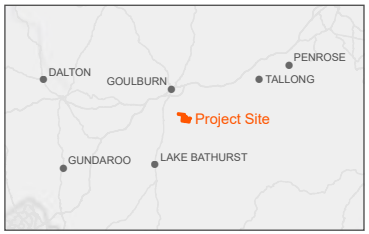


FIGURE E1.1

Dwelling Entitlement Impact Assessment

Legend

- Project Area
- Non-associated residence
- Host residence
- Future residence
- Noise criteria (35dB)
- Roads
- Cadastre Boundaries
- Rosedale Subdivision
- Vacant lots to be assessed
- Visual viewshed
- Proposed road upgrade area
- 1/DP870101
- 12/DP1016332
- 2/DP1187724
- 80/DP750018
- 3/DP1238347



Scale 1:30,000 at A4
GDA 1994 MGA Zone 55

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0 400 800

Metres

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Image Source: ESRI Basemap (2025) | **Data Source:** NSW DFSI (2025)

Appendix F Plans

FIGURE 1.2

Project Conceptual Layout

Legend

- Access Roads
- Security Fence
- Existing Transmission Line
- Roads
- Watercourses
- Watercourse / Bed Level Crossing
- Water Tank (40,000L)
- Water Tank (10,000L)
- Primary Access
- Emergency Access
- Project Area
- Development Footprint
- Proposed Road Upgrade
- Noise Barrier - 5.5 m high (HV Transformer)
- Noise Barrier - 3 m high (DC BESS PCU Station)
- Solar Panels
- Transgrid Line Works
- Centralised AC BESS
- Substation and O&M Facility Area
- Construction Compound Area
- Decentralised DC BESS
- Temporary Laydown Area

0 500 1,000

Metres

Scale: 1:0 at A4
GDA2020 MGA Zone 55

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Draft landscape plan

Gundary Solar Farm Landscape strategy

The aim of proposed landscaping is to provide a quick growing, dense screen with ecological benefits that would screen and reduce views of the solar farm infrastructure for residents and the public. Plant species have been selected that:

- are mostly locally native
- provide ecological benefit to the site (such as a food source for birds, habitat etc)
- are suitable for the site conditions (are hardy)
- can provide a quick growing screen, as well as longer-longevity species.

The draft landscape plan indicates general locations for screen planting on-site and has been prepared with preliminary input from Goulburn Mulwaree Council, and feedback from the community and surrounding land owners.

Subsequent to project approval, a detailed landscape plan would be prepared in which the planting guide may vary depending on future advice, the Project construction program and plant availability at the time.

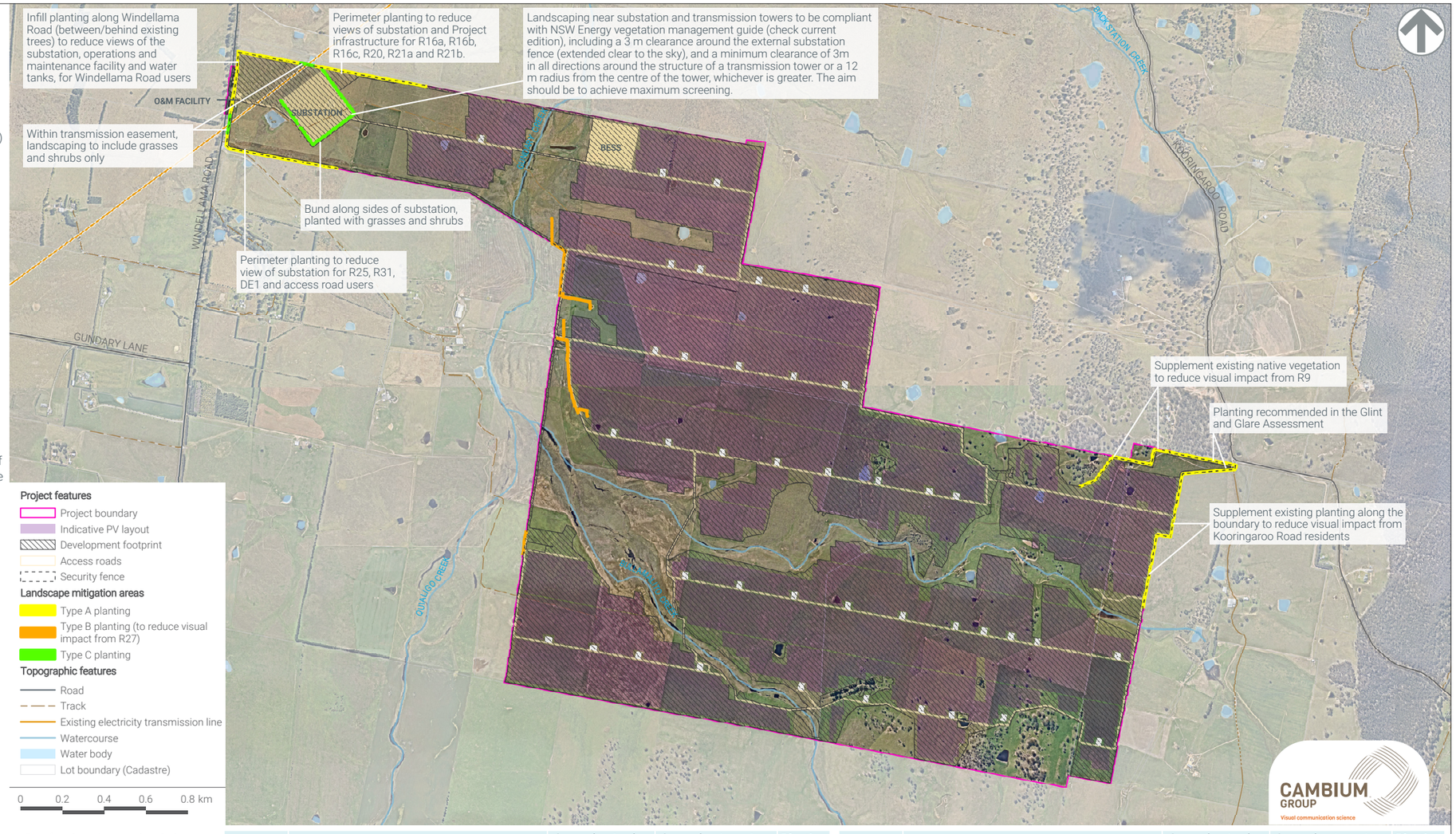
Draft planting guide

Source plants from a local native nursery using seed collected close to the Project site (if possible). Plan as early as feasible. Plant pot sizes for all plants to be 75 mm tubestock.

1. Planting areas to be 5 m wide plus a 1 m weed control buffer along each side.
2. Protect trees to be retained within or near the proposed planting areas.
3. Eradicate existing weed and pasture grass species within planting areas (at least one month before planting, with spot removal/treatment prior to planting if required). Carefully apply weed control when in the vicinity of existing trees to be retained.
4. Cultivate the full 5 m width and length of planting area to a depth of around 300 mm and incorporate soil improver and/or organic fertiliser (if appropriate) following soil testing in a number of locations to determine the appropriate soil conditioning. Do not cultivate near trees to be retained.
5. Avoid planting during harsh weather conditions (i.e. mid-summer and mid-winter).
6. Plant at densities of one plant per m^2, which equates to around 50 plants for every 10 lineal metres of planting bed.
7. Mulch (to a minimum depth of 75 mm) the full width of the planting areas.
8. Protect plants by installing and securing biodegradable plant guards around each plant (suitable to protect against rabbits if applicable) and stock fencing where necessary.

The detailed landscape plan to include a maintenance plan that continues throughout the operational period of the Project that includes:

- A defined initial establishment period of a minimum of 12 months
- Schedule for monitoring planting and watering
- Ongoing maintenance during and post establishment
- Guidance for replacement planting (for plants that fail to thrive).
- Records of maintenance practices, including listing species that have failed and any substituted plant species.



Draft planting schedule

This draft plant schedule provides an indicative range of site-appropriate species for future use in landscaping the site. The selection of species would be further refined during preparation of the detailed landscape plan.

Planting density

- Type A - 30% taller shrubs/small trees, 30% tall trees, 40% shrubs.
- Type B - 70% taller shrubs/small trees ,30% shrubs.
- Type C - 50% taller shrubs/small trees (*), 50% shrubs.

Plant type	Species[1]		Approximate size in 5 years (m)		Approximate mature size (m)		Planting type		
	Scientific name	Common Name	Height	Width	Height	Width	A	B	C
Taller trees	*Eucalyptus agglomerata*	Blue-leaved Stringybark	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus dives	Broad-leaved Peppermint	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus globoidea	White Stringybark	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus goniocalyx	Bundy	3 - 5	2 – 3	Up to 15	4 – 8	●		
	Eucalyptus macarthurii	Paddy's River Box	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus mannifera	Brittle Gum	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus rossii	Inland Scribbly Gum	3 - 5	2 – 3	Up to 20	4 – 8	●		
	Eucalyptus sieberi	Silvertop Ash	3 - 5	2 – 3	Up to 20	4 – 8	●		
Taller shrubs / small trees	*Acacia decurrens*	Early Black Wattle	2 – 5	1 – 2	3 – 10	2 – 3	●	●	*
	Acacia falciformis	Broad-leaved Hickory Wattle	2 – 5	1 – 2	2 – 10	2 – 3	●	●	*
	Acacia implexa	Hickory Wattle	2 – 5	1 – 2	5 – 10	2 – 3	●	●	*
	Acacia rubida	Red-stem Wattle	2 – 5	1 – 2	2 – 10	2 – 3	●	●	*
	Allocasuarina leuhmanii	Bulloak	Up to 5	1 – 2	5 – 10	2 – 3	●	●	
	Allocasuarina littoralis	Black Sheoak	Up to 5	1 – 2	5 – 10	2 – 3	●	●	
	Allocasuarina verticillata	Drooping Sheoak	Up to 5	1 – 2	4 - 10	2 – 3	●	●	*

Plant type	Species[1]		Approximate size in 5 years (m)		Approximate mature size (m)		Planting type		
	Scientific name	Common Name	Height	Width	Height	Width	A	B	C
Shrubs	*Acacia boormanii*	Snowy River Wattle	1 - 3	1 – 2	1 – 3	1 – 2		●	●
	Acacia cultriformis	Knife-leaf Wattle	2 – 4	1 – 2	Up to 4	2 – 3		●	●
	Acacia floribunda	Gossamer Wattle	2 – 4	1 – 2	Up to 4	2 – 3		●	●
	Acacia pravissima	Wedge-leaf Wattle	2 – 4	1 – 2	Up to 4	2 – 3		●	●
	Banksia ericfolia	Heath Banksia	2 – 4	1 – 2	4	2 – 3	●	●	●
	Banksia marginata	Silver Banksia	3 – 4	1 – 2	4	2 – 3	●	●	●
	Banksia spinulosa	Hairpin Banksia	2 - 3	1 – 2	3	2 – 3	●	●	●
	Callistemon citrinus	Crimson Bottlebrush	1 - 3	1 – 1.5	1 – 3	2 – 3	●	●	●
	Daviesia mimosoides	Bacon & Eggs Pea Flower	1 - 2	0.5	1 - 2	0.5	●	●	●
	Hakea sericea	Silky Needlebush	1 - 3	1	1 – 3	1	●	●	●
	Jacksonia scoparia	Dogwood	2 – 4	1 – 2	2 - 4	1 – 2	●	●	●
	Kunzea parvifolia	Violet Kunzea	1.5	3	1.5	3	●	●	●
	Leptospermum polygalfolium	Tea Tree	2 - 3	1 – 1.5	3	1 – 2	●	●	●

* Species dependent on final substation design and safety requirements.

[1] Sourced from *Goulburn Mulwaree Development Control Plan*, Appendix B: Preferred Planting Species, and "*Goulburn Mulwaree LGA - Trees for Landcare Projects*" (unpublished list of species by local landcare groups. Estimated plant heights at 5 years are based on feedback from residents at community information session, Goulburn, 24-25 March 2024. Estimated plant widths are based on height estimates and typical growth habits. Mature plant heights and growth habits are estimated from PlantNET (Royal Botanical Gardens Sydney https://plantnet.rbgsyd.nsw.gov.au/search/simple.htm), and represent what could be reasonably expected over the longer term.

AILA®

enVisage

This draft landscape plan has been prepared by registered landscape architect (Stacey Brodbeck) RLA #719 (Australian Institute of Landscape Architects). The intent is to achieve most of the mitigation screening within 4-6 years following completion of on-site planting, assuming optimal growing conditions (e.g. free of extended drought conditions and mass pest invasion). A detailed landscape plan is required once the project is approved, to fully document and confirm planting locations and plant species.

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