

# **Green Hill Solar Farm**

## **EN010170**

### **Environmental Statement**

### **Appendix 15.3: Green Hill C, D, and E**

### **Ground-Based Receptor Results**

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# Appendix 15.3: Green Hill Solar Farm - Green Hill C, Green Hill D, and Green Hill E Ground-Based Receptor Results

For: Green Hill Solar Farm

Site: Green Hill C, D and E

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Issue 01



# Quality Assurance

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# 1. Introduction

## 1.1 Background

Green Hill Solar Farm Ltd (the Applicant Green Hill Solar Farm Ltd) are involved in the development of a Nationally Significant Infrastructure Project (NSIP) solar scheme on land to the north of Northampton. The development is made up of a disparate number of sites, incorporating ground mounted solar panel.

A Glint and Glare Assessment has been undertaken to evaluate the potential light-sensitive receptors which may be impacted by glint and glare from Green Hill Solar Farm (hereafter referred to as the 'Scheme').

This report presents the findings of the Glint and Glare Assessment for Green Hill C, D and E for ground-based receptors.

## 1.2 Glint & Glare

Reflectivity refers to light that is reflected off surfaces (e.g. glazed surfaces or areas of metal cladding). The potential effects of reflectivity are glint and glare. The Federal Aviation Administration's (FAA) *'Technical Guidance for Evaluating Selected Solar Technologies on Airports'* provides the following glint and glare definitions:

- *Glint* – “a momentary flash of bright light”
- *Glare* – “a continuous source of bright light”

These present an ocular hazard to light sensitive receptors such as road users, train drivers, occupants of nearby dwellings, pilots, and air-traffic control personnel, as they can cause a brief, temporary or permanent eye damage (ocular impact categories and significance further discussed in Section 4.3).

In general, solar photovoltaic (PV) systems are constructed of dark, light absorbing material designed to maximise light adsorption and minimise reflection. However, the glass surfaces of solar PV systems also reflect sunlight to varying degrees throughout the day and year, based on the incidence angle of the sun relative to ground-based receptors. Lower incidence angles amount to increased reflection.

As such, the amount of light reflected off a solar PV panel surface or an array of solar panels depends on a variety of factors to include:

- The amount of sunlight hitting the surface;
- Its surface reflectivity;
- Its geographic location;
- Time of the year;
- Cloud coverage; and
- Surface orientation.



### **1.3 Scope of Work**

Based on definitions and factors described in Section 1.2 and in combination with available guidance and good practice recommendations, a desk-based evaluation was undertaken to evaluate the potential to experience the effects of glint and glare towards ground-based receptors.



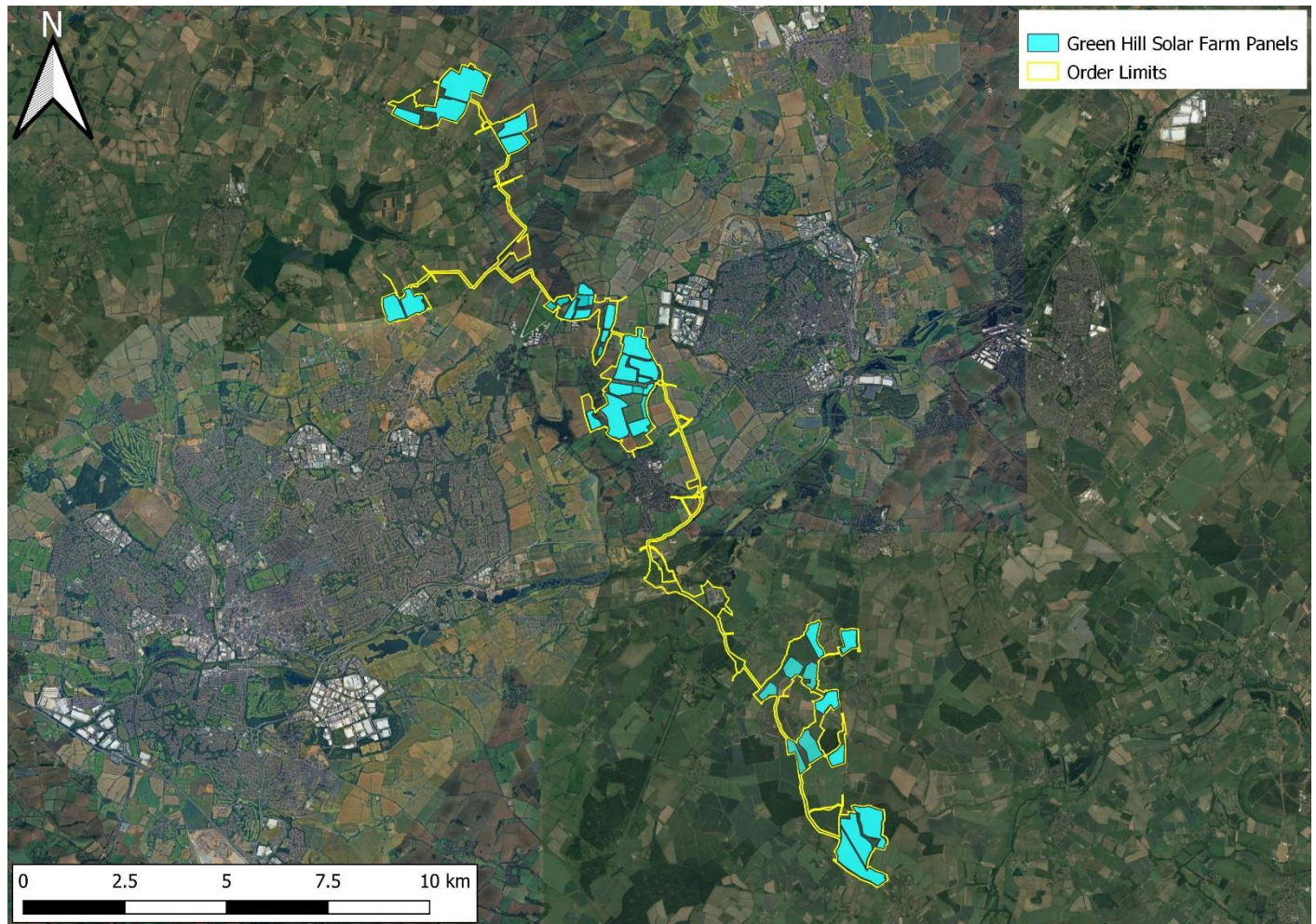


## 2. Development Characteristics

### 2.1 Green Hill Description

The Scheme is situated on land north of Northampton and is made up of a disparate number of sites, as can be seen below in Figure 2.1 below.

**Figure 2.1: Site Location**



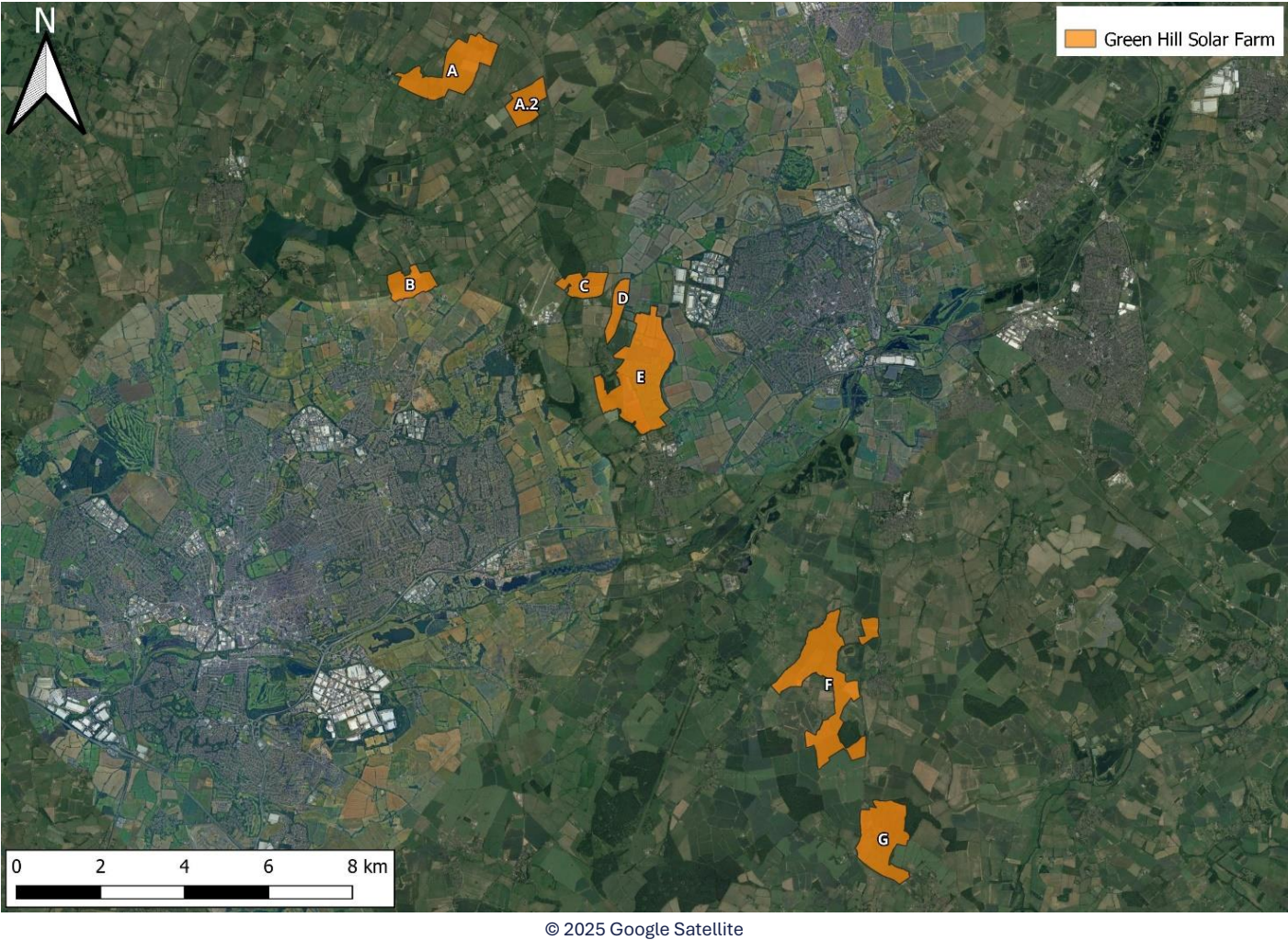
The Scheme will accommodate panels and Battery Energy Storage System (BESS). Green Hill BESS is allocated for a Battery Energy Storage System (BESS) and will not include the installation of any solar arrays. Therefore, this area will not be relevant for a glint and glare assessment. Flexibility has been sought to have BESS also on Green Hill C, however for the purposes of this assessment, panels have been assessed across Green Hill C as a worst case approach. An aerial view of the remaining areas (that will include solar panels) is shown below in Figure 2.2.

This report focuses on Green Hill C, D and E of Green Hill Solar Farm.





Figure 2.2: Green Hill Solar Farm



2.2 Proposed Development

The Proposed Development comprises of the installation of ground mounted solar PV arrays across eight areas of agricultural land. At this stage it is understood that two options are being considered for the Proposed Development: fixed tilt and single axis tracker.

The modelled PV module orientations and inclinations, as well as the modelled panel height, are summarised in the below tables.

For the fixed tilt option, a range of tilts are being considered from 10-35°. As such, a tilt of 22.5° has been modelled to represent the average tilt proposed. The average height<sup>1</sup> of the solar panels will be 1.95m above

<sup>1</sup> The heights of the panels (minimum = 0.40m and maximum = 3.5m) have been provided. A centre height of 1.95m (0.4+((3.5-0.4)/2)) has been used for the assessment.



ground. It is noted that a small variation in average panel height will not change the conclusions of the report because the modelling results are unlikely to be meaningfully affected.

The proposed PV module orientation and inclination, as well as PV panel height above ground, is summarised in in Table 2.1<sup>2</sup>.

**Table 2.1: Proposed Fixed Panel Details**

PV Array	Orientation (Azimuth) <sup>3</sup>	Panel Tilt	Height Above Ground (m) <sup>4</sup>
<b>Green Hill C</b>			
Arrays 1-3	180°	22.5°	1.95
<b>Green Hill D</b>			
Arrays 1-2	180°	22.5°	1.95
<b>Green Hill E</b>			
Arrays 1-9	180°	22.5°	1.95

For the single axis track option, the tracking range will be between +/- 60°, where 0° refers to the solar panel laying horizontal. The average height<sup>5</sup> of the solar panels will be 2.45m above ground. The proposed PV module orientation and inclination, as well as PV panel height above ground, is summarised in Table 2.2<sup>2</sup>.

**Table 2.2: Proposed Tracking Panel Details**

PV Array	Backtracking Method	Tracking Axis Orientation (Azimuth) <sup>3</sup>	Tracking Axis Tilt	Maximum Tracking Angle	Height Above Ground (m) <sup>4</sup>
<b>Green Hill C</b>					
Arrays 1-3	None	180°	0°	60°	2.45
<b>Green Hill D</b>					

<sup>2</sup> Based on information provided by Green Hill Solar Farm Ltd

<sup>3</sup> North referenced at 0°

<sup>4</sup> The middle of the solar panel has been used as the assessed height in metres above ground level, which has been chosen as it represents the smallest possible variation in height from the bottom and top of the solar panels. The small variation in panel height will not change the conclusions of the report because the modelling results are unlikely to be meaningfully affected. When the visibility of the solar panels for ground-based receptors is discussed, the maximum height of the panel is considered since it will be the most visible part of the panel.

<sup>5</sup> The heights of the panels (minimum = 0.40m and maximum = 4.5m) have been provided. A centre height of 2.45m  $(0.4 + ((4.5 - 0.4) / 2))$  has been used for the assessment.



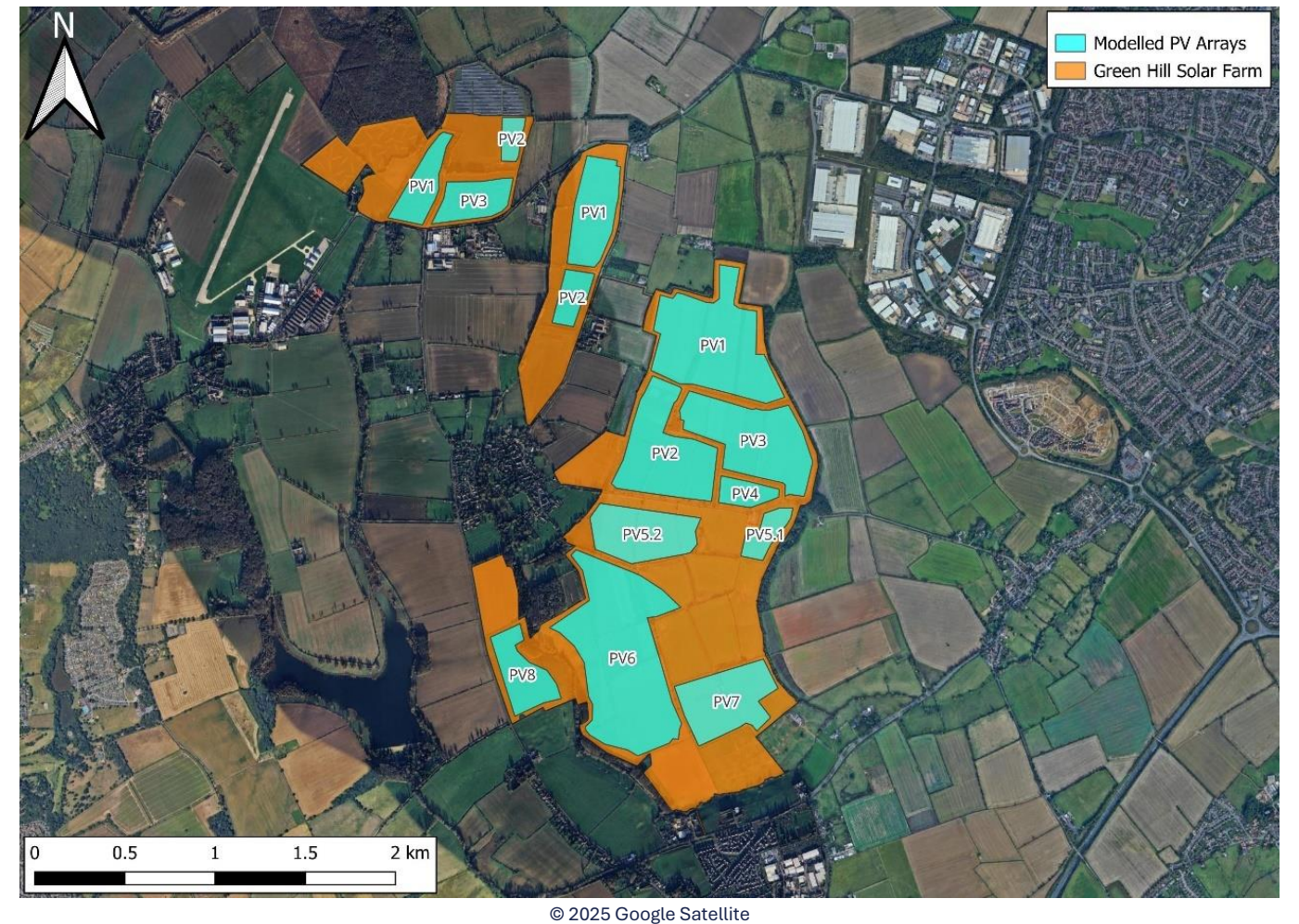


PV Array	Backtracking Method	Tracking Axis Orientation (Azimuth) <sup>3</sup>	Tracking Axis Tilt	Maximum Tracking Angle	Height Above Ground (m) <sup>4</sup>
Arrays 1-2	None	180°	0°	60°	2.45
Green Hill E					
Arrays 1-9	None	180°	0°	60°	2.45

For the purpose of this assessment, ‘Smooth glass with Anti-Reflective Coating (ARC)’ modules have been used to model the surface material of the arrays.

For modelling purposes, the array layouts have been simplified, as shown below in Figure 2.3 and Figure 2.4.

Figure 2.3: Modelled PV Panels



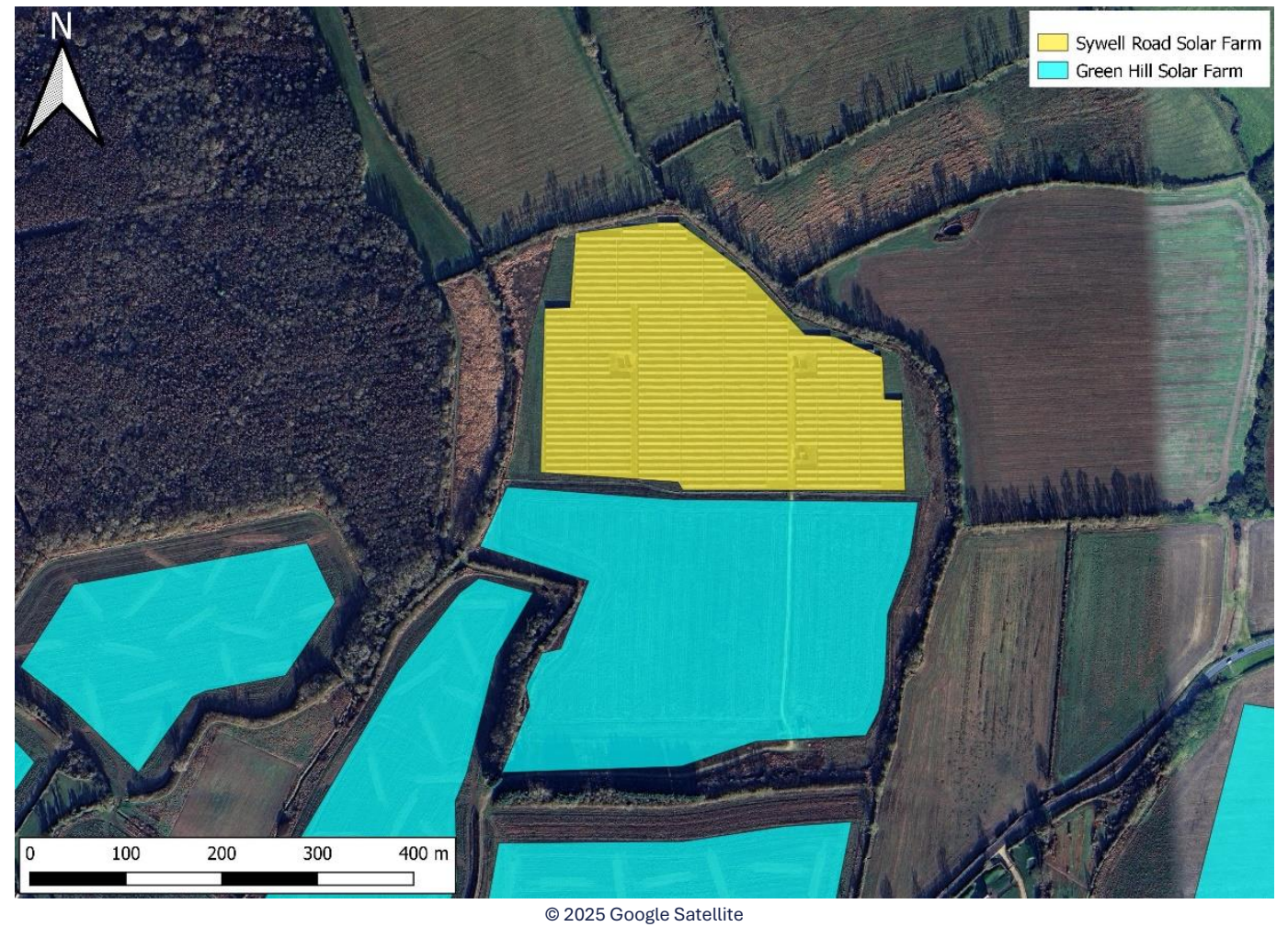


Sywell Road Solar Farm has also been included within the assessment to assess cumulative effects. The modelled PV module orientation and inclination, as well as PV panel height above ground, is summarised in Table 2.3<sup>6</sup>.

Table 2.3: Sywell Road Solar Farm Panel Details

PV Array	Orientation (Azimuth)	Panel Tilt	Height Above Ground (m)
Array 1	180°	27.5°	1.95

Figure 2.4: Modelled PV panels at Sywell Road Solar Farm



<sup>6</sup> Based on information available at:  
<https://publicaccess.wellingborough.gov.uk/online-applications/applicationDetails.do?keyVal=N6LOP5RBGKZ00&activeTab=summary>



## 3. Legislation & Guidance

### 3.1 National Planning Policy

#### 3.1.1 National Policy Statement for Energy

The National Policy Statement for energy (EN-1)<sup>7</sup> sets out the overarching policy for decisions by the Secretary of State for nationally significant energy infrastructure. It is noted that Glint and Glare is not specifically mentioned within EN-1.

Section 5.5 of EN-1 sets out the primary policy for the relationship between aviation and new energy:

“5.5.1 All aerodromes, covering civil and military activities, as well as aviation technical sites, meteorological radars and other types of defence interests (both onshore and offshore) can be affected by new energy development.

5.5.2 Collaboration and co-existence between aviation, defence and energy industry stakeholders should be strived for to ensure scenarios such that neither is unduly compromised.

...

5.5.5 UK airspace is important for both civilian and military aviation interests. It is essential that new energy infrastructure is developed collaboratively alongside aerodromes, aircraft, air systems and airspace so that safety, operations and capabilities are not adversely affected by new energy infrastructure. Likewise, it is essential that aerodromes, aircraft, air systems and airspace operators work collaboratively with energy infrastructure developers essential for net zero. Aerodromes can have important economic and social benefits, particularly at the regional and local level, but their needs must be balanced with the urgent need for new energy developments, which bring about a wide range of social, economic and environmental benefits.

...

5.5.7 The approaches and flight patterns to aerodromes can be irregular owing to a variety of factors including the performance characteristics of the aircraft concerned and the prevailing meteorological conditions. It may be possible to adapt flight patterns to work alongside new energy infrastructure without impacting on aviation safety.

...

5.5.55 Lighting must also be designed in such a way as to ensure that there is no glare or dazzle to pilots and/or ATC, aerodrome ground lighting is not obscured and that any lighting does not diminish the effectiveness of aeronautical ground lighting and cannot be confused with aeronautical lighting. Lighting may also need to be compatible with night vision devices for military low flying purposes.”

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<sup>7</sup> <https://assets.publishing.service.gov.uk/media/65bbfdbc709fe1000f637052/overarching-nps-for-energy-en1.pdf>



### 3.1.2 National Policy Statement for Renewable Energy Infrastructure

The National Policy Statement for Renewable Energy Infrastructure (EN-3)<sup>8</sup> sets out the primary policy for decisions by the Secretary of State for nationally significant renewable energy infrastructure.

The above policy is applicable to significant renewable energy infrastructure (i.e. solar photovoltaic >50 MW in England, where MW is measured as alternating current). However, the principles should be extended to infrastructure <50MW.

Sections 2.10.27 and 2.10.102-2.10.106 outlines the potential impact of glint and glare that the applicants may consider:

*“2.10.27 Utility-scale solar farms are large sites that may have a significant zone of visual influence. The two main impact issues that determine distances to sensitive receptors are therefore likely to be visual amenity and glint and glare. These are considered in Landscape, Visual and Residential Amenity (paragraphs 3.10.84-3.10.92) and Glint and Glare (paragraphs 3.10.93 – 3.10.97) impact sections below.”*

...

*2.10.102 Solar panels are specifically designed to absorb, not reflect, irradiation<sup>9</sup>. However, solar panels may reflect the sun’s rays at certain angles, causing glint and glare. Glint is defined as a momentary flash of light that may be produced as a direct reflection of the sun in the solar panel. Glare is a continuous source of excessive brightness experienced by a stationary observer located in the path of reflected sunlight from the face of the panel. The effect occurs when the solar panel is stationed between or at an angle of the sun and the receptor.*

*2.10.103 Applicants should map receptors to qualitatively identify potential glint and glare issues and determine if a glint and glare assessment is necessary as part of the application.*

*2.10.104 When a quantitative glint and glare assessment is necessary, applicants are expected to consider the geometric possibility of glint and glare affecting nearby receptors and provide an assessment of potential impact and impairment based on the angle and duration of incidence and the intensity of the reflection.*

*2.10.105 The extent of reflectivity analysis required to assess potential impacts will depend on the specific project site and design. This may need to account for ‘tracking’ panels if they are proposed as these may cause differential diurnal and/or seasonal impacts.*

*2.10.106 When a glint and glare assessment is undertaken, the potential for solar PV panels, frames and supports to have a combined reflective quality may need to be assessed, although the glint and glare of the frames and supports is likely to be significantly less than the panels.”*

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<sup>8</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1147382/NPS\\_EN-3.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147382/NPS_EN-3.pdf)

<sup>9</sup> Most commercially available solar panels are designed with anti-reflective glass or are produced with anti-reflective coating and have a reflective capacity that is generally equal to or less hazardous than other objects typically found in the outdoor environment, such as bodies of water or glass buildings.





Sections 2.10.134-2.10.136 outlines the potential mitigations for glint and glare impacts that the applicants may consider:

*“2.10.134 Applicants should consider using, and in some cases the Secretary of State may require, solar panels to comprise of (or be covered with) anti-glare/anti-reflective coating with a specified angle of maximum reflection attenuation for the lifetime of the permission.*

*2.10.135 Applicants may consider using screening between potentially affected receptors and the reflecting panels to mitigate the effects.*

*2.10.136 Applicants may consider adjusting the azimuth alignment of or changing the elevation tilt angle of a solar panel, within the economically viable range, to alter the angle of incidence. In practice this is unlikely to remove the potential impact altogether but in marginal cases may contribute to a mitigation strategy.”*

Sections 2.10.158-2.10.159 outlines further detail on the potential glint and glare impacts that the Secretary of State may consider as part of their decision making:

*“2.10.158 Solar PV panels are designed to absorb, not reflect, irradiation. However, the Secretary of State should assess the potential impact of glint and glare on nearby homes, motorists, public rights of way, and aviation infrastructure (including aircraft departure and arrival flight paths).*

*2.10.159 Whilst there is some evidence that glint and glare from solar farms can be experienced by pilots and air traffic controllers in certain conditions, there is no evidence that glint and glare from solar farms results in significant impairment on aircraft safety. Therefore, unless a significant impairment can be demonstrated, the Secretary of State is unlikely to give any more than limited weight to claims of aviation interference because of glint and glare from solar farms.”*

## **3.2 Local Planning Policy**

### **3.2.1 West Northampton Joint Core Strategy Local Plan**

15.3.8 The West Northampton Joint Core Strategy Local Plan<sup>10</sup> sets out the long-term vision and objectives for the whole area covered by the former Daventry District, Northampton Borough, and South Northamptonshire Councils for the plan period up to 2029, including strategic policies for steering and shaping development. The West Northamptonshire Joint Core Strategy Local Plan (Part 1) states in paragraph 4.44:

*“Development that aims to secure sustainable communities is designed to minimise its impact on the environment and so combat climate change. A realistic and serious response to meeting climate change objectives must be made through the JCS direction on policies. Larger scale developments, including Sustainable Urban Extensions (SUEs), provide the opportunity to secure exemplary standards of design, renewable or low carbon energy generation and through the location of development reduce the need to travel. All development proposals will need to fully consider climate change adaption to meet the vision of sustainable development.”*

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<sup>10</sup> <https://www.westnorthants.gov.uk/west-northamptonshire-joint-core-strategy/west-northamptonshire-joint-core-strategy-local-plan-part>





In relation to Glint and Glare, Policy S10 – Sustainable Development Principles describes how visual intrusion from renewable energy developments should be limited:

*“When considering planning applications for low carbon and renewable energy, an assessment will need to take account of impacts on landscape, townscape, natural, historical and cultural features and areas and nature conservation interests. Proposals should also use high quality design to minimise impacts on the amenity of the area, in respect of visual intrusion, noise, dust, and odour and traffic generation.”*

### 3.2.2 North Northamptonshire Joint Core Strategy

The North Northamptonshire Joint Core Strategy<sup>11</sup> provides the strategic planning policies for the future development of the area from 2016 to 2031.

Policy 26: Renewable and Low Carbon Energy states that renewable and low carbon energy generation will be supported where the proposal meets the following criteria relevant to glint and glare:

*“The siting of development does not significantly adversely affect the amenity of existing, or proposed, residential dwellings and/or businesses, either in isolation or cumulatively, by reason of noise, odour intrusion, dust, traffic generation, visual impact or shadow flicker;”*

### 3.2.3 Wind and Solar Energy Supplementary Planning Document

The Wind and Solar Energy Supplementary Planning Document<sup>12</sup> provides guidance on the information to be submitted with a planning application and sets out the key issues that will be taken into consideration by the Council.

Section 16 of the Wind and Solar Energy Supplementary Planning Documents states the following on Glint and Glare:

*“The effect of glint and glare on landscape, neighbouring uses and aircraft safety is identified in the NPPG as an important factor to consider when assessing proposals for large scale solar PV farms. The guidance further indicates that there may be additional impacts if solar arrays track the daily movement of the sun.*

*Solar panels are designed to absorb as much light as possible rather than reflect it. Nevertheless, there is the potential for glint and glare effects. ‘Glint’ refers to a momentary flash of light produced as direct reflection of the sun whilst ‘glare’ is a more continuous source of brightness relative to the ambient lighting. These effects can have a visual impact on the landscape and can act as a potential hazard or distraction for motorists, pilots, pedestrians and occupiers’ of nearby properties. Specifically in respect to aviation, the Civil Aviation Authority has issued interim guidance on solar photovoltaic systems. There is also potential for glint and glare to have an affect on nearby heritage assets.*

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<sup>11</sup> <https://www.northnorthants.gov.uk/planning-strategies-and-plans/north-northamptonshire-local-plan>

<sup>12</sup> <https://www.northnorthants.gov.uk/planning-strategies-and-plans/supplementary-planning-documents-spd>



*The potential for glint and glare to occur should therefore be assessed. This should address the additional impacts of ‘tracking’ panels, which follow the movement of the sun across the sky to maximise solar gain, where proposed. Modelling tools are available to evaluate solar farm projects. Undertaking an assessment at an early stage will enable variables such as the orientation and tilt angles of arrays to be changed, where necessary, to minimise any adverse impacts.”*

### 3.2.4 MK:Plan (2016-2031)

The MK:Plan (2016-2031)<sup>13</sup> sets out the vision and framework for the future development of the area from 2015 to 2031.

Policy SC3: Low Carbon and Renewable Energy Generation states the following regarding glint and glare:

*“A. The Council will encourage proposals for low carbon and renewable energy generation developments that are led by, or meet the needs of local communities.*

*B. Planning permission will be granted for proposals to develop low carbon and renewable energy sources (including community energy networks) unless there would be:*

- 1. Significant harm to the amenity of residential area, due to noise, traffic, pollution or odour;*
- 2. Significant harm to wildlife species or habitat;*
- 3. Unacceptable landscape and visual impact on the landscape, including cumulative impacts;*
- 4. Unacceptable harm to the significance of heritage assets; and*
- 5. Unacceptable impact on air safety.*

*C. In addition to the above criteria, wind turbines should avoid unacceptable shadow flicker and electro-magnetic interference and be sited an appropriate distance away from occupied properties, consistent with the size and type of the turbine. Proposals to develop solar PV farms should avoid unacceptable visual impact from the effect of glint and glare on the landscape, on neighbouring uses and aircraft safety. Proposals for large scale renewable energy in the open countryside should be informed by a satisfactory landscape and visual impact assessment.”*

## 3.3 Emerging Local Planning Policy

### 3.3.1 MK City Plan 2050

The MK City Plan 2050<sup>14</sup> sets out the strategy for growth through to 2050 related to the need for homes, creating jobs and supporting businesses, transport around the city, climate change, the natural and built environment, design of streets, and the places which support everyday living (i.e. schools and shops).

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<sup>13</sup><https://www.milton-keynes.gov.uk/sites/default/files/2022-05/PlanMK%20Adoption%20Version%20%28March%202019%29.pdf>

<sup>14</sup> <https://www.milton-keynes.gov.uk/planning-and-building/planning-policy/mk-city-plan-2050>



Policy CEA6: Low and Zero Carbon Energy Provision states the following regarding low carbon and renewable energy developments:

*“2. Proposals to development low carbon and renewable energy sources (including community energy networks) and infrastructure needed to facilitate the green energy transition (e.g. grid and sub-station upgrades) will be supported, unless there would be*

*a. Conflict with other policies within the development plan.*

*b. Unacceptable harm on air safety, in terms of the risk of incidents on approaches/departures from local airfields/airports, as well as radar interference.”*

### 3.4 Guidance

#### 3.4.1 National Planning Practice Guidance

In the absence of specific guidance on solar development, the National Planning Practice Guidance for ‘Renewable and Low Carbon Energy’<sup>15</sup> dictates the following with respect to large-scale solar PV developments and glint and glare:

*“The deployment of large-scale solar farms can have a negative impact on the rural environment, particularly in undulating landscapes. However, the visual impact of a well-planned and well-screened solar farm can be properly addressed within the landscape if planned sensitively.*

*Particular factors a local planning authority will need to consider include:*

- ...the proposal’s visual impact, the effect on landscape of glint and glare (see guidance on landscape assessment) and on neighbouring uses and aircraft safety;*
- the extent to which there may be additional impacts if solar arrays follow the daily movement of the sun;...*
- the potential to mitigate landscape and visual impacts through, for example, screening with native hedges;...*

*The approach to assessing cumulative landscape and visual impact of large scale solar farms is likely to be the same as assessing the impact of wind turbines. However, in the case of ground mounted solar panels it should be noted that with effective screening and appropriate land topography the area of a zone of visual influence could be zero.”*

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<sup>15</sup> <https://www.gov.uk/guidance/renewable-and-low-carbon-energy>



### 3.4.2 BRE Planning guidance for the development of large-scale ground mounted solar PV panels

The BRE Planning guidance for the development of large-scale ground mounted solar PV panels<sup>16</sup> sets out guidance relating to different planning application considerations. In relation to Glint and Glare, the guidance states:

*“Glint may be produced as a direct reflection of the sun in the surface of the solar PV panel. It may be the source of the visual issues regarding viewer distraction. Glare is a continuous source of brightness, relative to diffused lighting. This is not a direct reflection of the sun, but rather a reflection of the bright sky around the sun. Glare is significantly less intense than glint.*

*Solar PV panels are designed to absorb, not reflect, irradiation. However the sensitivities associated with glint and glare, and the landscape/ visual impact and the potential impact on aircraft safety, should be a consideration. In some instances it may be necessary to seek a glint and glare assessment as part of a planning application. This may be particularly important if ‘tracking’ panels are proposed as these may cause differential diurnal and/or seasonal impacts.*

*The potential for solar PV panels, frames and supports to have a combined reflective quality should be assessed. This assessment needs to consider the likely reflective capacity of all of the materials used in the construction of the solar PV farm.”*

### 3.5 UK Highway Code

The UK Highway Code states that a road user should be aware of particular hazards such as glare from the sun and should adjust their driving style appropriately. Solar PV panels reflect sunlight producing solar glare under specific conditions, which may pose hazard towards road users.

### 3.6 Network Rail Guidance

Rail Industry Standard (RIS) RIS-0737-CCS on ‘Signal Sighting Assessment Requirements’ highlights that:

*“a planned change external to the railway could affect signal sighting, for example changes that affect the built environment (for example, a new structure causing obscuration, a solar farm causing reflection).”*

It should be noted that Network Rail guidance does not provide a specific glare assessment methodology for rail receptors, beyond the above information..

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<sup>16</sup> [REDACTED]





## 4. Methodology

### 4.1 Glare Assessment Model

The Glint and Glare evaluation will be undertaken using ForgeSolar software. ForgeSolar succeeds the Solar Glare Hazard Analysis Tool (SGHAT), whose use was required by the FAA to demonstrate compliance with the standards for measuring ocular impact for any proposed solar energy systems at airports. ForgeSolar is the software specialist for modelling glare impacts and the software is used extensively across the UK for assessing impacts toward airports, transportation and residential dwellings.

### 4.2 Receptor Identification

In general, light-sensitive receptors with view of a solar PV development have potential to experience solar reflection. While no technical distance limits/thresholds are reported within which solar reflections are possible for such receptors, the potential or significance of a reflection decreases with distance due to an observer’s decreasing field of vision capability with increasing distance, as well as possible obstructions such as shielding caused by terrain and vegetation. For the purpose of this assessment, the following good practice considerations will be applied, incorporating relevant guidance as laid out in Section 3.0.

Table 4.1: Receptor Identification Criterium

Dwellings	<p>There is not a defined screening distance for consideration of the potential glare impact of rooftop solar panels on residential dwellings. For residential dwellings very close to a proposed rooftop solar development, there will be instances where the resident does not have geometric line of sight of the proposed roof. In addition, there may be obstructions to the line of sight such as other buildings or vegetation screening.</p> <p>Line of sight for this assessment is reviewed using Google Satellite Images and Google Street View. Where there is potential line of sight, glare modelling is undertaken. Professional judgement is used to determine a representative number of dwelling points to be modelled.</p> <p>Industry guidance recommends glare modelling for ground floor residential receptors because it is typically the most occupied part of the dwelling during daylight hours. A height of 1.8 m above ground level will be considered to account for observer’s eye level on ground floor (main habitable rooms are generally on the ground floor), unless otherwise stated.</p>
Road Users	<p>Major national, national and regional roads are predicted to have higher level of traffic compared to local roads and have higher sensitivity. Therefore, these roads that are within 1 km from the solar PV development boundary with a visual line of sight to the panels will be considered for the technical modelling.</p> <p>An additional height of 1.5 m above ground level will be considered to represent the typical road user viewing height.</p>



	A driver field-of-view (FOV) of 100° will be applied (50° either side of direction of travel). Glare that appears beyond this FOV is mitigated.
Railways	<p>Railways in the immediate surrounding area to around 100 m from the solar PV development boundary with a visual line of sight to the panels will be considered. Length of railway line will be assessed via individual static receptor locations no more than 200 m apart up to 500 m from the Proposed Development boundaries.</p> <p>An additional height of 2.75 m above ground level will be considered to represent typical train driver viewing height.</p> <p>A train driver field-of-view (FOV) of 60° will be applied (30° either side of direction of travel). Glare that appears beyond this FOV is mitigated.</p> <p>Where signals are located immediately adjacent to or above a railway line, their lens is in line of sight of the Proposed Development, and are used to direct trains on the lines, these will also be assessed as individual static receptors.</p>

4.3 Magnitude of Impact

4.3.1 Ocular Impact

Ocular impact significance depends on the line of sight between the reflector (solar PV panels) and the receptor, the location of the receptor relative to the reflector and thus the solar reflection, the time of the day, they path between the Sun and the reflective surface, and the reflection exposure period (e.g. momentary exposure is less significant that prolonged exposure).

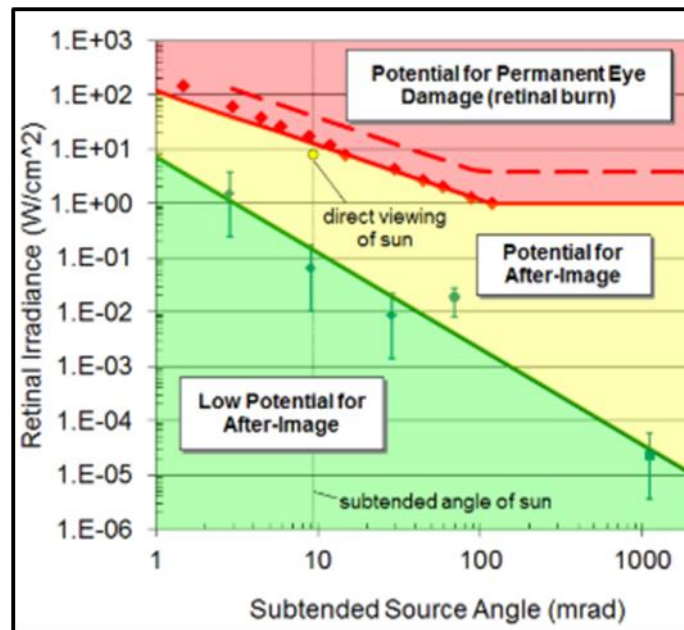
As such, ocular impact can be classified into three levels based on the retinal irradiance and subtended source angle: low potential for after-image (green), potential for after-image (yellow), and potential for permanent eye damage (red). These categories are illustrated in the Ocular Hazard plot<sup>17</sup> shown in Figure 4.1 (NOTE: this is a universal Ocular Hazard plot and does not represent potential glare conditions that may be experienced at the Proposed Development.).

The subtended source angle represents the size of glare observed by receptor, while the retinal irradiance is the quantity of energy impacting the retina of the observer. As it can be seen from Figure 4.1, wide subtended source angles can cause retinal irritation/damage even at low retinal irradiance.

<sup>17</sup> Sliney, D.H. and B.C. Freasier, 1973, Evaluation of Optical Radiation Hazards, Applied Optics, 12(1), p. 1-24.



Figure 4.1: Ocular Hazard Plot



#### 4.3.2 Glint & Glare Impact Significance

##### 4.3.2.1 Dwellings

Table 4.2: Dwellings Impact Significance Guidance

<b>No Impact</b>	Solar reflection is not geometrically possible or will not be visible from the assessed receptor.
<b>Low</b>	<p>Predicted glare of any intensity (green or yellow) occurs for less than 60 minutes per day and for less than three months per year.</p> <p>Predicted glare of any intensity (green or yellow) occurs for longer than 60 minutes and for more than 3 months per year. However, applying professional judgement renders the residual potential glare to be not significant.</p> <p>Mitigation is not required.</p>
<b>Moderate</b>	<p>Predicted glare of any intensity (green or yellow) occurs for longer than 60 minutes or for more than 3 months per year. Applying professional judgement does not decrease the significance of the glare.</p> <p>Predicted glare of any intensity (green or yellow) occurs for longer than 60 minutes and for more than 3 months per year. Applying professional judgement does not decrease the significance of the glare sufficiently to reduce to Low Impact.</p> <p>Mitigation may be required at planner's discretion.</p>
<b>High</b>	<p>Predicted glare of any intensity (green or yellow) occurs for longer than 60 minutes per day and for more than 3 months of the year. Applying professional judgement does not decrease the significance of the glare.</p> <p>Mitigation will be required if the proposed development is to proceed.</p>



#### 4.3.2.2 Road Users

**Table 4.3: Road User Impact Significance Guidance**

Road Users	While there is no specific guidance on glint and glare impact significance evaluation or limits, the following approach will be adapted in line with best available practice guidance/recommendations:	
	<b>No or Insignificant Impact</b>	Solar reflection is not geometrically possible or will not be visible from the assessed receptor.
	<b>Low</b>	<p>Potential glare of any intensity (yellow or green) predicted towards a local road.</p> <p>Potential glare of any intensity (e.g. yellow or green) predicted towards a major national, national or regional road, and does not originate in front of driver (e.g. not in centre of FOV).</p> <p>Potential glare of any intensity (e.g. yellow or green) predicted towards a major national, national or regional road and originates in front of driver (e.g. in centre of FOV). However, applying professional judgement renders the residual potential glare to be not significant.</p> <p>Mitigation is not considered necessary.</p>
	<b>Moderate</b>	<p>Potential glare of any intensity (e.g. yellow or green) predicted towards a major national, national or regional road and originates in front of driver (e.g. not in centre of FOV). Applying professional judgement does not decrease the significance of the glare.</p> <p>Mitigation may be required at regulator's discretion.</p>
	<b>High</b>	<p>Potential glare of any intensity (e.g. yellow or green) predicted towards a major national, national or regional road, and originates in front of driver (e.g. in centre of FOV). Applying professional judgement does not decrease the significance of the glare.</p> <p>Mitigation recommended if the Proposed Development is to proceed.</p>
Based on industry guidance, it is recommended that any predicted solar reflection is assessed pragmatically. Therefore, professional judgement will be applied and the following factors will also be considered when determining whether a solar reflection is significant:		



	<div><div></div><div><div>1. The relative position and visibility of the reflecting panels relative to road vehicle drivers and whether the glare is within the field of view of drivers;</div><div>2. Additional screening and obstructions to the line of sight;</div><div>3. The separation distance between the reflecting panels and the vehicle driver;</div><div>4. The extent to which impacts coincide with effects of direct sunlight;</div><div>5. The length of road affected;</div><div>6. The intensity of the solar reflection.</div></div></div>
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4.3.2.3 Railways

Table 4.4: Railway Impact Significance Guidance

Train Drivers	While there is no specific guidance on glint and glare impact significance evaluation or limits, the following approach will be adapted in line with best available practice guidance/recommendations:	
	No or Insignificant Impact	Solar reflection is not geometrically possible or will not be visible from the assessed receptor.
	Low	<div>Glare predicted which does <u>not</u> originate in front of the train driver (30° field of view either side of the direction of travel).</div> <div>Glare originates in front of the train driver (30° field of view either side of the direction of travel). However, applying professional judgement renders the residual potential glare to be not significant.</div> <div>Mitigation is not considered necessary.</div>
	Moderate	<div>Glare originates in front of the train driver (30° field of view either side of the direction of travel). Applying professional judgement does not decrease the significance of the glare.</div> <div>Mitigation not required but could be considered necessary.</div>
	High	<div>Glare originates in front of the train driver (30° field of view either side of the direction of travel). Applying professional judgement does not decrease the significance of the glare and the residual glare remains significant.</div> <div>Mitigation required if the Proposed Development is to proceed.</div>
Based on industry guidance, it is recommended that any predicted solar reflection is assessed pragmatically. Therefore, professional judgement will be applied and the following factors will also be considered when determining whether a solar reflection is significant:		



	<div><div></div><div><div><div>1. The relative position and visibility of the reflecting panels relative to train drivers and whether the glare is within the field of view of drivers;</div><div>2. The separation distance between the reflecting panels and the train driver;</div><div>3. The extent to which impacts coincide with effects of direct sunlight;</div><div>4. Presence of other infrastructure (e.g. signals, crossings).</div><div>5. The length of railway line affected;</div><div>6. The intensity of the solar reflection.</div></div></div></div>
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4.4 Time Zone / Datum

The UK uses British Summer Time (BST, UTC +01:00) in the summer and Greenwich Mean Time (GMT, UTC +0) in the winter. For the purpose of this report all time references are in GMT. All locations are given in Eastings and Northings using the UK National Grid Reference system, unless otherwise specified.

4.5 Assumptions, Limitations & Fixed Model Variables

Provided in Appendix A is a list of assumptions, limitations and fixed variables of the model and assessment methodology.

4.6 Elevation Data

Elevation data for the modelled arrays and road and residential receptors were obtained using Defra Survey<sup>18</sup> LiDAR data database. Digital Terrain Model data was downloaded from the most recent survey. ForgeSolar employs an interactive Google map such that latitude, longitude, and ground elevation of PV geometry and receptors are automatically queried from Google, providing necessary information for sun position and vector calculations.

<sup>18</sup> <https://environment.data.gov.uk/survey>



## 5. Receptor Screening & Model Considerations

### 5.1 Residential Dwellings

While no technical distance limits/thresholds are reported within which solar reflections are possible for such receptors, the potential for significance of a reflection decreases with distance due to an observer's decreasing field of vision capability with increasing distance, as well as possible obstructions such as shielding caused by terrain and vegetation. Industry guidance advises that dwelling receptors at up to 1 km from solar panels may be considered in terms of potential glare impact.

A number of residential dwellings exist within 1 km of the Order Limits. Only the receptor points closest to the Scheme with a potential line of sight towards the PV panels were considered, as other dwellings are expected to be screened by these receptors, as well as vegetation and/or other infrastructure found in between them. The high-level review was undertaken using mapping and aerial photography.

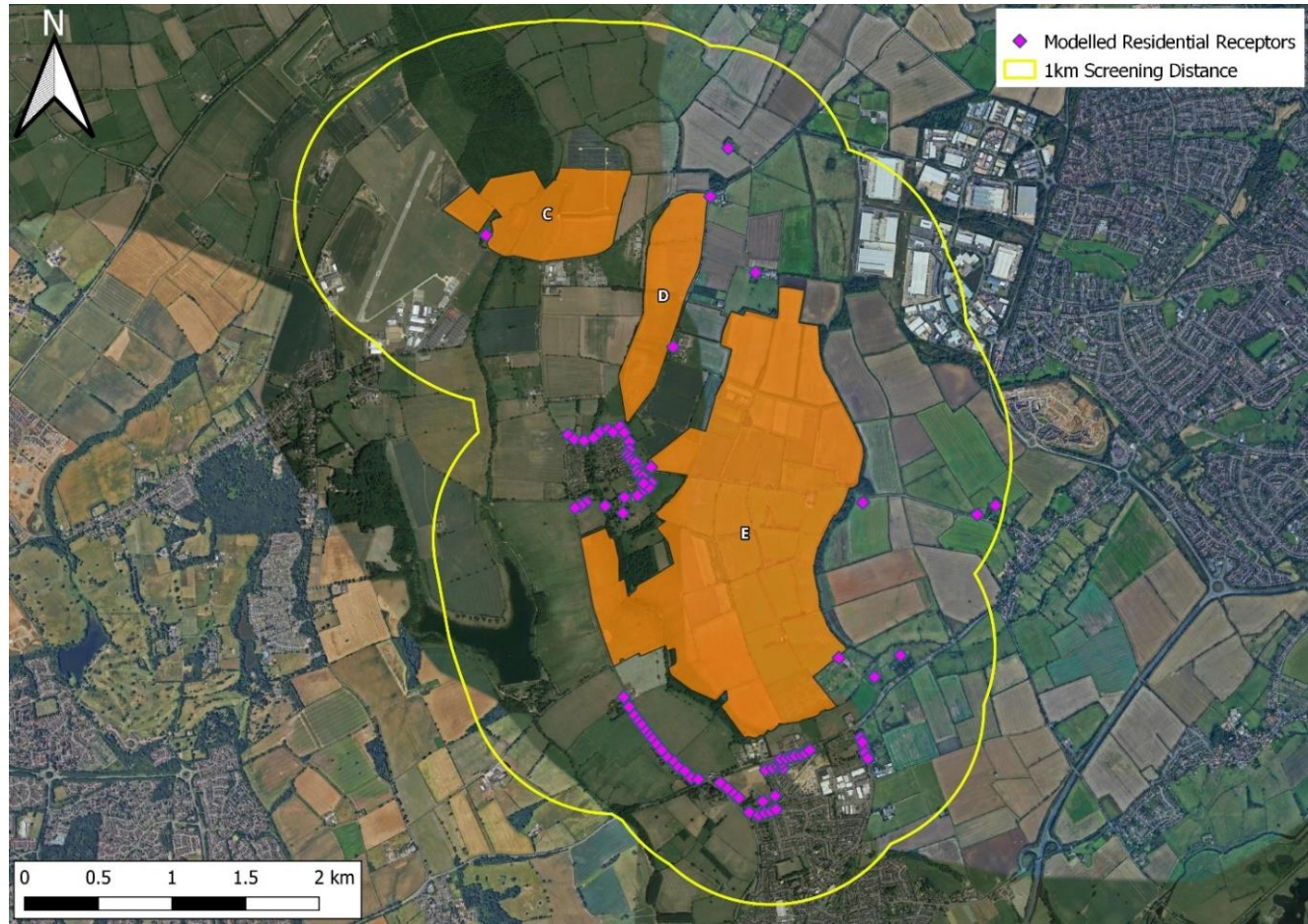
The residential dwellings will be modelled at an additional height of 1.8m above ground level as this is considered to represent typical viewing height on ground floor, which is typically occupied during daylight hours.

In total, 85 residential dwellings have been identified within this area. These receptors have been modelled as observation points (R1, R2,...). Receptor points closest to the Scheme with a potential line of sight towards the PV panels can be seen below in Figure 5.1 to Figure 5.4.





Figure 5.1: Nearby Residential Dwellings Sites C, D and E

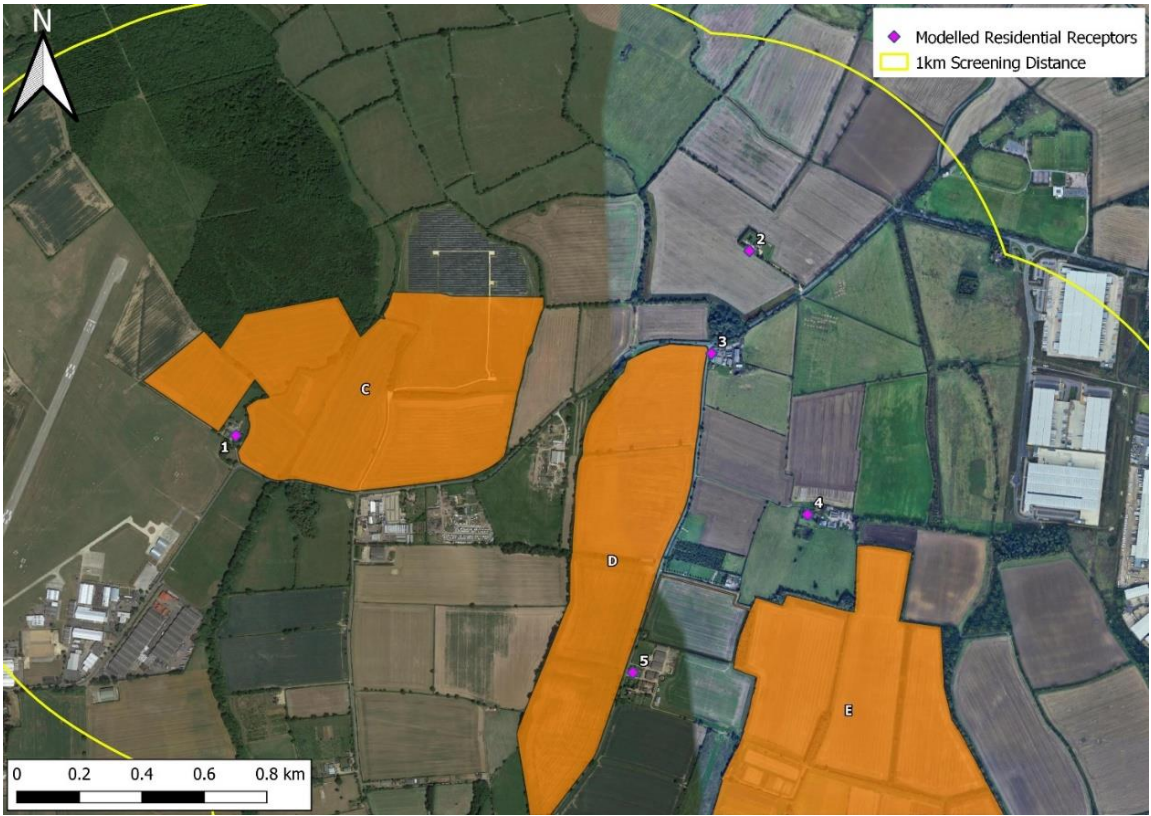


Imagery © 2024 Google Satellite



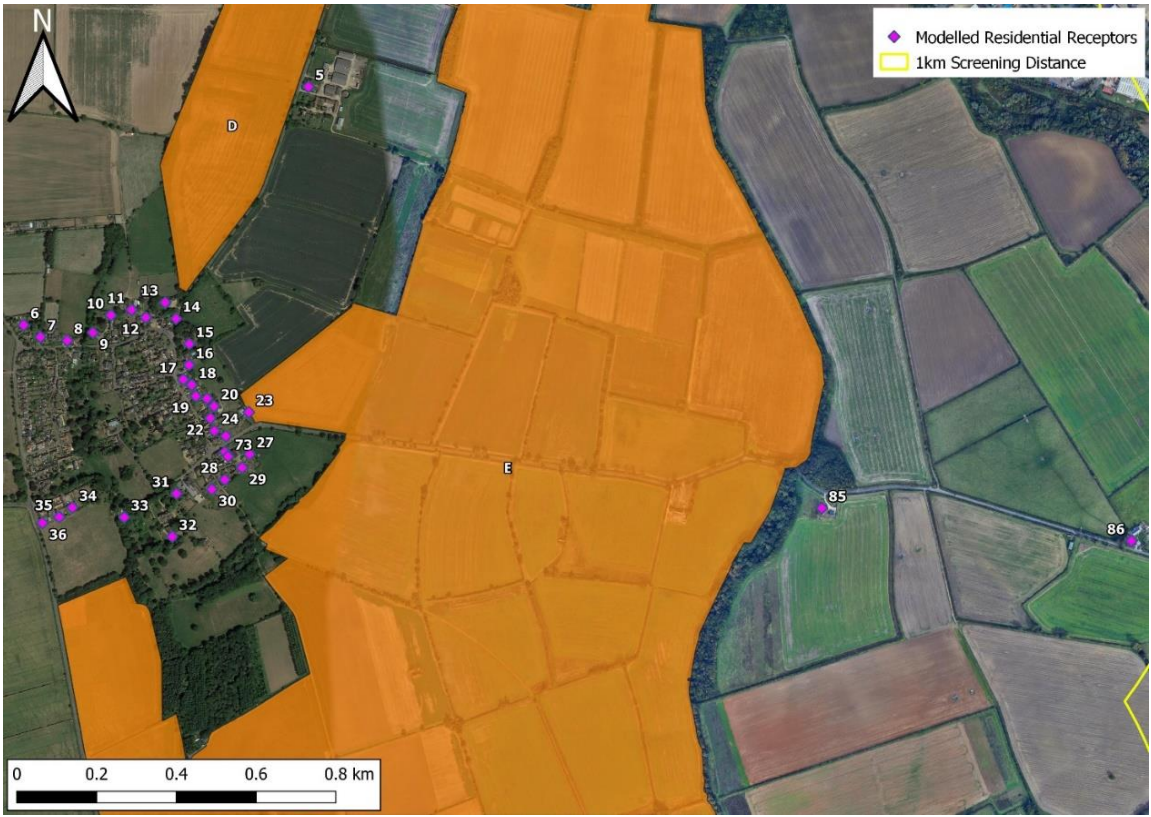


Figure 5.2: Modelled Residential Dwellings Sites C, D and E

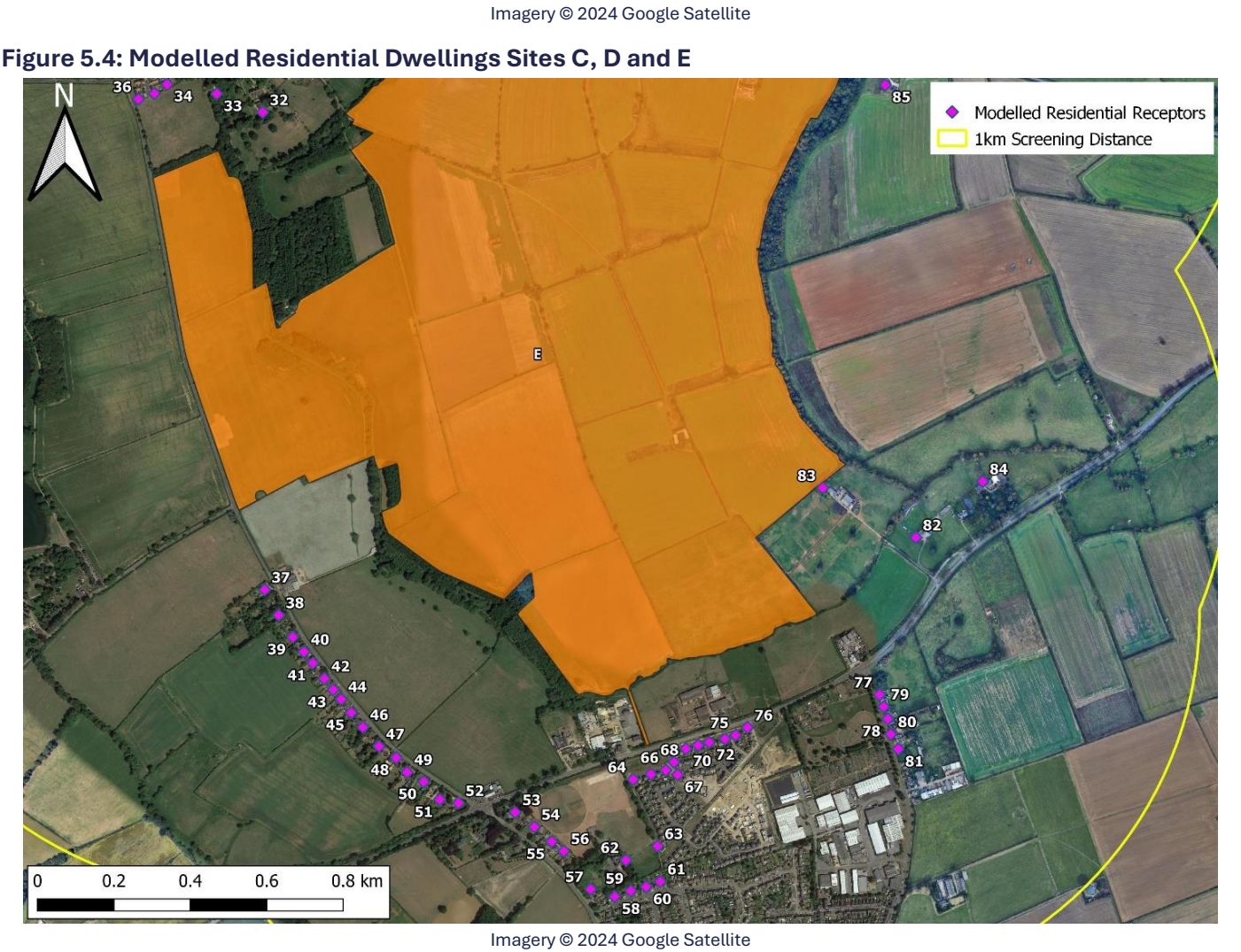


Imagery © 2024 Google Satellite

Figure 5.3: Modelled Residential Dwellings Sites C, D and E





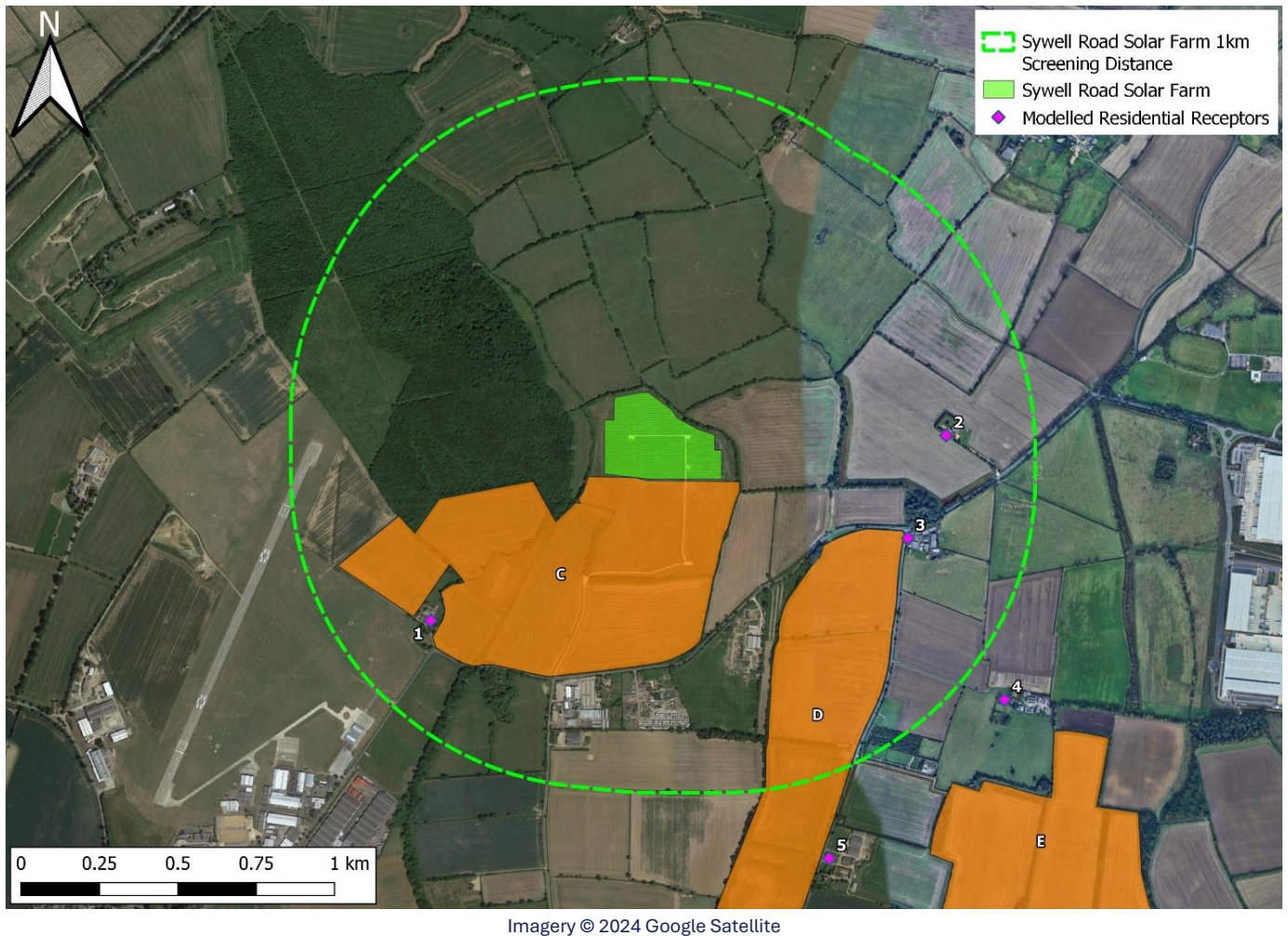


The list of dwelling receptors is presented in Appendix B.

It is noted that Sywell Road Solar Farm is located adjacent to the northern boundary of Green Hill C. As such, cumulative impacts towards residential dwellings that are located within a 1km screening distance of Sywell Road Solar Farm will be considered.



**Figure 5.5: Residential Dwellings within 1km of Sywell Road Solar Farm**



## 5.2 Road Infrastructure

In accordance with industry guidance, road receptors within 1km of the site boundary of the Scheme may be considered.

Major National, National and Regional roads are predicted to have higher level of traffic compared to local roads and have higher sensitivity. Therefore, these roads that are within 1 km from the solar PV development boundary with a visual line of sight to the panels will be considered for the technical modelling.

In accordance with industry guidance, technical modelling is not recommended for local roads, where traffic densities are likely to be relatively low. Any solar reflections from the Scheme that are experienced by a road user along a local road would be considered 'Low / Minor' impact magnitude.

A high-level review indicates that the A43 is within the screening distance of Site B, however line of sight is obstructed between the road users and reflecting panels by vegetation and terrain. The A43 is shown below in Figure 5.6. Google Street View imagery taken from Winter and Spring months (when vegetation is most sparse) has been utilised to review the line of sight from the B573 and Site B, shown below in Figure 5.8 to Figure 5.13.



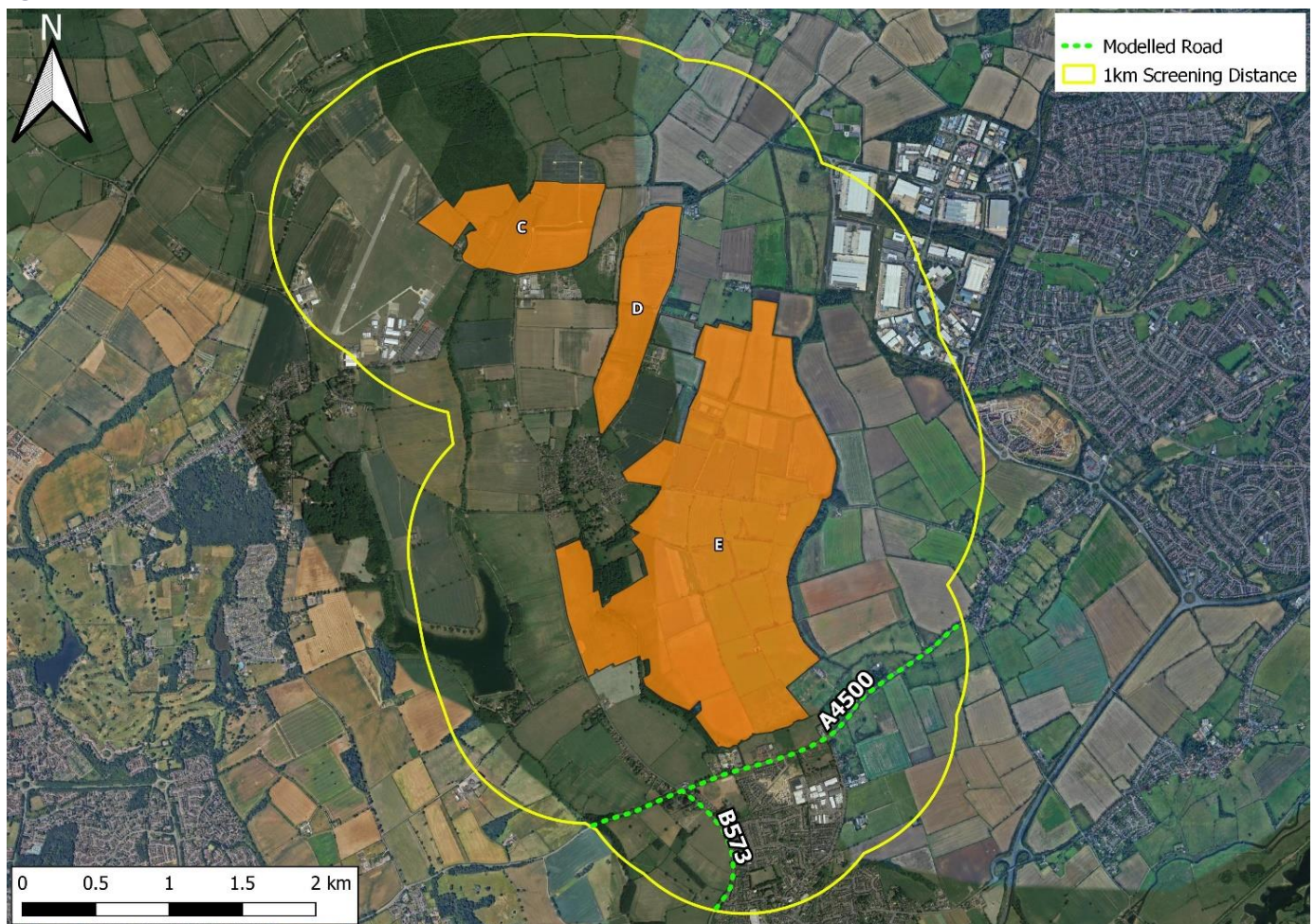


As shown in each image, the surrounding vegetation and existing infrastructure will obstruct line of sight to the proposed panels, such that they would not be visible for vehicles travelling on the B573. As such, potential impacts on road users along the B573 are not considered further.

Based on a high-level review, there is a potential line of sight to the panels from A4500 road users such that glare modelling should be undertaken, as shown below in Figure 5.6.

In line with guidance, a field-of-view (FOV) of 100° has been applied (50° view angle to left and right). According to research, glare outside this FOV is mitigated. Furthermore, as a worst-case approach, modelled observation points (which do not include the field of view of the drivers) have been included along the road length at 100m intervals. These receptors have been modelled as Observation Points (OPs). Each modelled observation point has been modelled at an additional 1.5m above ground level to represent the eye level of a standard height road user. The list of road receptors is presented in Appendix C.

**Figure 5.6: Modelled Road Infrastructure Sites C, D and E**

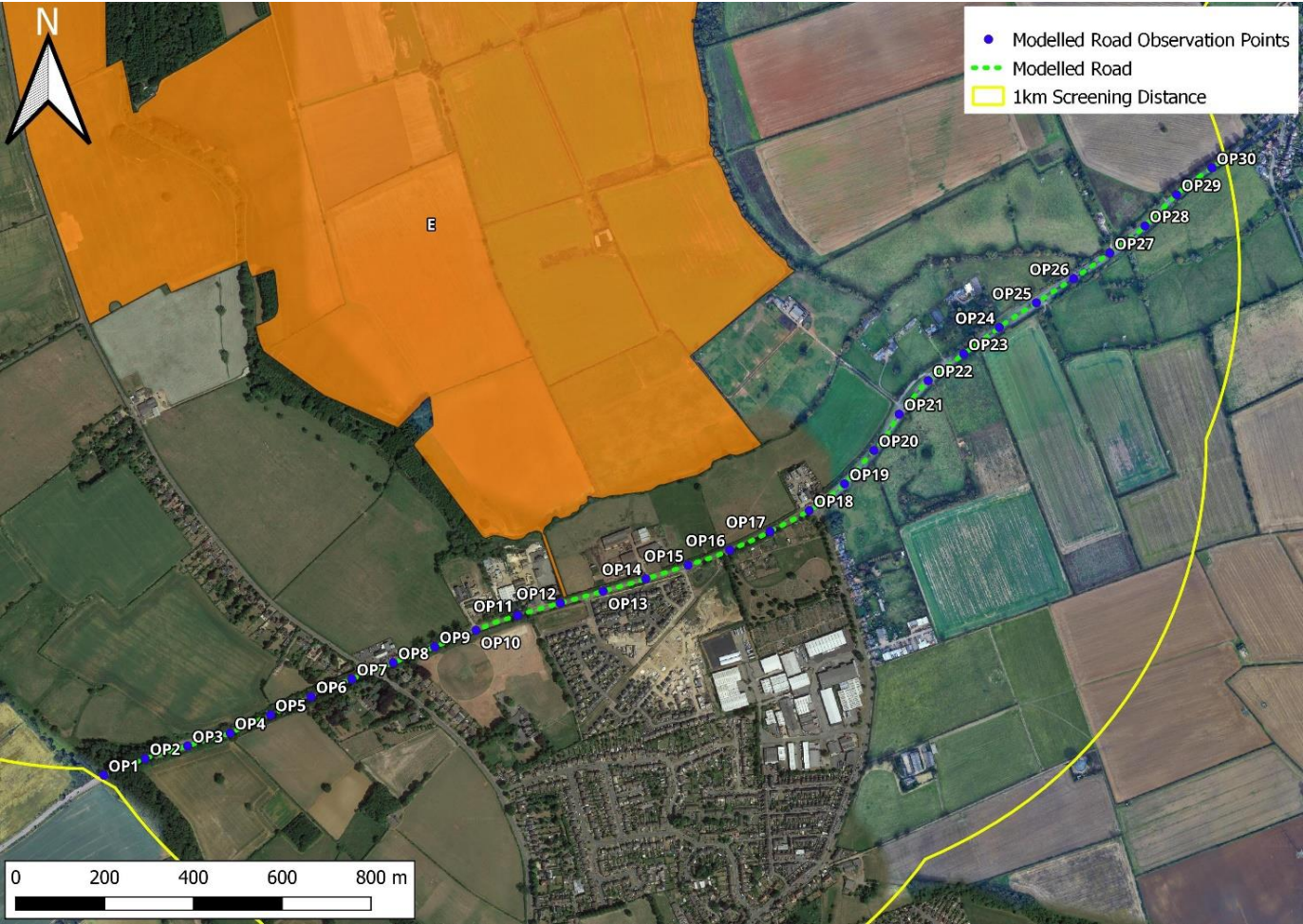


Imagery © 2024 Google Satellite





Figure 5.7: Modelled Road Observation Points



Imagery © 2024 Google Satellite

Figure 5.8: Line of Sight from the B573 towards Green Hill E



Imagery © 2024 Google Street View



Figure 5.9: Line of Sight from the B573 towards Green Hill E



Figure 5.10: Line of Sight from the B573 towards Green Hill E



Figure 5.11: Line of Sight from the B573 towards Green Hill E



Figure 5.12: Line of Sight from the B573 towards Green Hill E





Figure 5.13: Line of Sight from the B573 towards Green Hill E



5.3 Rail Infrastructure

Based on industry guidance, rail operators may raise an objection to solar developments that are within 500m of their infrastructure due to safety implications caused by glare on train drivers, level crossings and railway light signals. A high-level receptor review indicates no railway infrastructure within this screening distance. Therefore, no rail receptors will be considered within the modelling assessment.



## 6. Modelled Results and Interpretation

### 6.1 Residential Results

#### 6.1.1 Fixed Panel Results

Receptor	Results
R1	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill C and from PV1 from Green Hill D.</p> <p>R1 is located outside the 1km screening distance of PV1 Green Hill D. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 Green Hill D.</p> <p>Glare is predicted from PV1, PV2 and PV3 Green Hill C from mid-March to late September between 05:30-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R2	<b><i>No glare is predicted towards R2</i></b>
R3	<p>Glare is predicted from PV1 and PV2 from Green Hill C.</p> <p>Glare is predicted from PV1 and PV2 Green Hill C from mid-March to late May and from late August to late September between 17:30-18:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R4	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill C and from PV1 from Green Hill D.</p> <p>R4 is located outside the 1km screening distance of PV1, PV2 and PV3 Green Hill C. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1, PV2 and PV3 Green Hill C.</p> <p>Glare is predicted from PV1 Green Hill D from mid-March to late September between 17:30-19:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R5	Glare is predicted from PV2 from Green Hill D and from PV1 from Green Hill E.



	<p>R5 is located outside the 1km screening distance of PV1 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill D from early May to early August between 17:30-19:00 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R6	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill E.</p> <p>R6 is located outside the 1km screening distance of PV1 and PV3 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 and PV3 Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from mid-March to mid-May and from late July to late September between 05:30-06:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R7	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill E.</p> <p>R7 is located outside the 1km screening distance of PV1 and PV3 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 and PV3 Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from mid-March to early June and from early July to late September between 05:30-06:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R8	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill E.</p> <p>R8 is located outside the 1km screening distance of PV1 and PV3 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 and PV3 Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from mid-March to late September between 05:30-06:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>



R9	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill E.</p> <p>R9 is located outside the 1km screening distance of PV3 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3 Green Hill E.</p> <p>Glare is predicted from PV1 and PV2 Green Hill E from mid-March to late September between 05:00-06:30 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R10	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill E.</p> <p>R10 is located outside the 1km screening distance of PV3 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3 Green Hill E.</p> <p>Glare is predicted from PV1 and PV2 Green Hill E from mid-March to late September between 05:00-06:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R11-R21	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill E.</p> <p>Glare is predicted from PV1, PV2 and PV3 Green Hill E from mid-March to late September between 05:00-06:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R22	<p>Glare is predicted from PV1, PV2, PV3 and PV4 from Green Hill E.</p> <p>Glare is predicted from PV1, PV2, PV3 and PV4 Green Hill E from mid-March to late September between 05:00-06:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R23	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill E.</p> <p>Glare is predicted from PV1, PV2 and PV3 Green Hill E from early March to early October between 05:00-07:00 for a maximum of 25 minutes per day.</p>





	<p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R24-R25	<p>Glare is predicted from PV1, PV2, PV3 and PV4 from Green Hill E.</p> <p>Glare is predicted from PV1, PV2, PV3 and PV4 Green Hill E from early March to late September between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R26-R27	<p>Glare is predicted from PV1, PV2, PV3 and PV4 from Green Hill E.</p> <p>Glare is predicted from PV1, PV2, PV3 and PV4 Green Hill E from mid-March to late September between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R28	<p>Glare is predicted from PV1, PV2, PV3, PV4, PV5.1 and PV5.2 from Green Hill E.</p> <p>R28 is located outside the 1km screening distance of PV5.1 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 Green Hill E.</p> <p>Glare is predicted from PV1, PV2, PV3, PV4 and PV5.2 Green Hill E from mid-March to late September between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R29	<p>Glare is predicted from PV1, PV2, PV3, PV4 and PV5.2 from Green Hill E.</p> <p>Glare is predicted from PV1, PV2, PV3, PV4 and PV5.2 Green Hill E from late March to mid-September between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R30	<p>Glare is predicted from PV1, PV2, PV3, PV4, PV5.1 and PV5.2 from Green Hill E.</p> <p>R30 is located outside the 1km screening distance of PV1 and PV5.1 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 and PV5.1 Green Hill E.</p>



	<p>Glare is predicted from PV2, PV3, PV4 and PV5.2 Green Hill E from mid-March to late September between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R31	<p>Glare is predicted from PV1, PV2, PV3, PV4, PV5.1 and PV5.2 from Green Hill E.</p> <p>R31 is located outside the 1km screening distance of PV1, PV4 and PV5.1 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1, PV4 and PV5.1 Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from late March to mid-September between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R32	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV5.2 from Green Hill E.</p> <p>R32 is located outside the 1km screening distance of PV3, PV4 and PV5.1 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV4 and PV5.1 Green Hill E.</p> <p>Glare is predicted from PV2 and PV5.2 Green Hill E from late March to late September between 05:00-06:30 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R33-R36	<p>Glare is predicted from PV1, PV2, PV3, PV4, PV5.1 and PV5.2 from Green Hill E.</p> <p>R33-R36 are located outside the 1km screening distance of PV1, PV3, PV4 and PV5.1 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1, PV3, PV4 and PV5.1 Green Hill E.</p> <p>Glare is predicted from PV2 and PV5.2 Green Hill E from late March to mid-September between 05:30-06:30 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R37	<p>Glare is predicted from PV1, PV2, PV3 and PV4 from Green Hill E.</p> <p>Glare is predicted from PV1, PV2, PV3 and PV4 Green Hill E from mid-March to late September between 05:00-07:00 for a maximum of 25 minutes per day.</p>



	<p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R38	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from late March to late September between 05:30-07:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R39	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from early April to early September between 05:30-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R40	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from mid-April to late August between 05:30-06:30 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R41	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from late April to late August between 05:30-06:30 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R42	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from late April to mid-August between 05:00-06:30 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R43	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p>



	<p>Glare is predicted from PV6 and PV7 Green Hill E from early May to early August between 05:00-06:30 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R44	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from early May to early August between 05:00-06:30 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R45	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from mid-May to late July between 05:00-06:30 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R46	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from late May to late July between 05:00-06:30 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R47	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from early June to early July between 05:30-06:30 for a maximum of 20 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R48-R73	<b><i>No glare is predicted towards R48-R73</i></b>
R74	<p>Glare is predicted from PV8 from Green Hill E.</p> <p>R74 is located outside the 1km screening distance of PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 Green Hill E.</p>
R75	Glare is predicted from PV6 and PV8 from Green Hill E.





	<p>R75 is located outside the 1km screening distance of PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from early May to early August between 17:30-18:30 for a maximum of 15 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R76	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R76 is located outside the 1km screening distance of PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from mid-May to late July between 17:30-18:30 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R77	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R77 is located outside the 1km screening distance of PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from early May to early August between 17:30-18:30 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R78	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R78 is located outside the 1km screening distance of PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from mid-May to late July between 17:30-18:30 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>



R79	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R79 is located outside the 1km screening distance of PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from late May to mid-July between 17:30-18:30 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R80-R81	<p>Glare is predicted from PV6, PV7 and PV8 from Green Hill E.</p> <p>R80-R81 are located outside the 1km screening distance of PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from late March to mid-September between 17:30-19:00 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R82	<p>Glare is predicted from PV6, PV7 and PV8 from Green Hill E.</p> <p>R82 is located outside the 1km screening distance of PV6 and PV8 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV6 and PV8 Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from early April to early September between 18:00-19:00 for a maximum of 15 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R83	<p>Glare is predicted from PV2, PV4, PV5.1 and PV5.2 from Green Hill E.</p> <p>Glare is predicted from PV2, PV4, PV5.1 and PV5.2 Green Hill E from mid-March to late September between 17:30-19:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R84	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV5.2 from Green Hill E.</p>



	<p>R84 is located outside the 1km screening distance of PV2, PV4 and PV5.2 Green Hill E. As such, a maximum impact magnitude of ‘low impact’ is assigned to glare predicted from PV2, PV4 and PV5.2 Green Hill E.</p> <p>Glare is predicted from PV3 and PV5.1 Green Hill E from mid-March to late September between 17:30-19:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R85	<p>Glare is predicted from PV1, PV2, PV3, PV4, PV5.1 and PV5.2 from Green Hill E.</p> <p>R84 is located outside the 1km screening distance of PV1, PV2, PV4, PV5.1 and PV5.2 Green Hill E. As such, a maximum impact magnitude of ‘low impact’ is assigned to glare predicted from PV1, PV2, PV4, PV5.1 and PV5.2 Green Hill E.</p> <p>Glare is predicted from PV3 Green Hill E from early April to early September between 17:30-19:00 for a maximum of 20 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>

Detailed results can be provided upon request.

With reference to impact significance guidance (Section 4.3.2.1), a ‘no impact’ significance may be classified where glare will not be visible from the assessed receptor. As such, no impacts are predicted to occur at R2, and R48-R73.

With reference to impact significance guidance (Section 4.3.2.1), a ‘low impact’ may be classified where glare of any intensity occurs for less than 60 minutes per day and for less than 3 months per year. As such, low impacts are predicted to occur at R44-R47, R74 and R76-R79.

With reference to impact significance guidance (Section 4.3.2.1), a ‘moderate impact’ may be classified where unmitigated glare of any intensity occurs for longer than 60 minutes per day, or for more than 3 months of the year. Residential dwellings R1, R3-R43, R75 and R80-R85 are predicted to receive glare for less than 60 minutes daily, however the incidence of glare is predicted to exceed 3 months. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.

## 6.1.2 Tracking Panel Results

Receptor	Results
R1	Glare is predicted from PV1 and PV3 from Green Hill C, PV1 and PV2 from Green Hill D, and PV1, PV2, PV3, PV4, PV5.1 and PV5.2 of Green Hill E.



Receptor	Results
	<p>R1 is located outside the 1km screening distance of PV1 and PV2 of Green Hill D, and PV1, PV2, PV3, PV4, PV5.1 and PV5.2 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 and PV2 of Green Hill D, and PV1, PV2, PV3, PV4, PV5.1 and PV5.2 of Green Hill E.</p> <p>Glare is predicted from PV1 and PV3 Green Hill C from mid-January to early February, early March to early July and late July to late November between 04:00-08:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R2	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill C and PV1 from Green Hill D.</p> <p>R2 is located outside the 1km screening distance of PV1 of Green Hill C. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 of Green Hill C.</p> <p>Glare is predicted from PV2 and PV3 Green Hill C and PV1 Green Hill D from late September to mid-March between 15:00-19:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R3	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill C and PV1 from Green Hill D.</p> <p>R3 is located outside the 1km screening distance of PV1 of Green Hill C. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 of Green Hill C.</p> <p>Glare is predicted from PV2 and PV3 Green Hill C and PV1 Green Hill D from early September to late April and from mid to late August between 16:00-19:30 for a maximum of 40 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R4	<p>Glare is predicted from PV1, PV2 and PV3 from Green Hill C and PV1 and PV2 from Green Hill D.</p> <p>R4 is located outside the 1km screening distance of PV1, PV2 and PV3 of Green Hill C. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1, PV2 and PV3 of Green Hill C.</p>



Receptor	Results
	<p>Glare is predicted from PV1 and PV2 Green Hill D from early to mid-January, late January to mid-April, late May to early June, early July to late August and early September to late November between 15:30-20:30 for a maximum of 10 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R5	<p>Glare is predicted from PV1 and PV3 from Green Hill C, PV2 from Green Hill D, and PV1, PV2, PV3, PV4 and PV5.1 from Green Hill E.</p> <p>R5 is located outside the 1km screening distance of PV1 of Green Hill C, and PV3, PV4 and PV5.1 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1 of Green Hill C, and PV3, PV4 and PV5.1 of Green Hill E.</p> <p>Glare is predicted from PV3 Green Hill C, PV2 Green Hill D and PV1 and PV2 Green Hill E from early to mid-March, mid-April to late August and early October to early February between 06:00-09:00 and 18:30-20:30 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R6	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R6 is located outside the 1km screening distance of PV3, PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from early March to late April and from early September to mid-October between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R7	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R7 is located outside the 1km screening distance of PV3, PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from early March to late April and from late August to mid-October between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>





Receptor	Results
R8	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R8 is located outside the 1km screening distance of PV3, PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from early September and early to mid-October between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R9	<p>Glare is predicted from PV2, PV5.1 and PV7 from Green Hill E.</p> <p>R9 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E for days in mid-October between 06:30-07:30 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R10	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R10 is located outside the 1km screening distance of PV3, PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from early September and early to mid-October between 05:00-07:00 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R11	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R11 is located outside the 1km screening distance of PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E in early February, from early March to mid-April, in late April, in mid-August and from mid-September to early November between 04:30-08:00 for a maximum of 30 minutes per day.</p>



Receptor	Results
	As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.
R12	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R12 is located outside the 1km screening distance of PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E in early February, from early March to late April, in early August and from early September to early November between 04:30-08:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R13	<p>Glare is predicted from PV2, PV3, PV4, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R13 is located outside the 1km screening distance of PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 and PV5.2 Green Hill E from early March to mid-April, from late August to early September and from mid-September to early February between 05:00-08:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R14	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R14 is located outside the 1km screening distance of PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from late January to early February, from early March to mid-April, in early May, and from mid-August to early November between 04:30-08:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R15	Glare is predicted from PV2, PV3, PV4, PV5.1, PV5.2 and PV7 from Green Hill E.



Receptor	Results
	<p>R15 is located outside the 1km screening distance of PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 and PV5.2 Green Hill E from early March to mid-May and from early August to early February between 04:00-08:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R16	<p>Glare is predicted from PV2, PV3, PV4, PV5.1 and PV7 from Green Hill E.</p> <p>R16 is located outside the 1km screening distance of PV4, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV4, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from early March to mid-May, in early June, in early July and from early August to late October between 04:00-07:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R17	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R17 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from early March to late April, in mid-May, in early June and from early August to mid-October between 04:00-07:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R18	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R18 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from early March to mid-May, in early June, in late June, in early July and from early August to mid-October between 03:30-07:00 for a maximum of 30 minutes per day.</p>



Receptor	Results
	<p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R19	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R19 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from early March to mid-May, in late May, from mid to late June, in early July and from early August to mid-October between 03:30-07:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R20	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R20 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from early March to early June, in late June, in early July and from late July to early October between 03:30-07:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R21	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R21 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from mid-March to late May, in early June, in late June, and from early August to early October between 03:30-07:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R22	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p>



Receptor	Results
	<p>R22 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from mid-March to late May, in early June, in late June, and from early August to late October between 03:30-07:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R23	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R23 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from early March to early July and from late July to early February between 03:30-09:00 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R24	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R24 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 and PV3 Green Hill E from early March to early July and from late July to early October between 03:30-07:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R25	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R25 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from early March to early July and from late July to mid-October between 03:30-07:00 for a maximum of 30 minutes per day.</p>





Receptor	Results
	As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.
R26	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R26 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from early March to early July and from late July to late October between 03:30-07:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R27	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R27 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from mid-March to early July, from late July to early October, from early to late November and from mid-December to late January between 03:30-09:00 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R28	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R28 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from late March to early July, from late July to mid-September, and in late September between 03:30-07:00 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R29	Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.



Receptor	Results
	<p>R29 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from late March to early July, from late July to late September, and in late October between 03:30-07:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R30	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R30 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from late March to early July, from mid-May to late June and from late July to late October between 03:30-07:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R31	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R31 is located outside the 1km screening distance of PV3, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E in late June, in early July and from late August to early September between 03:30-06:00 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R32	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R32 is located outside the 1km screening distance of PV3, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E from early June to early July and from late August to early September between 03:30-06:00 for a maximum of 20 minutes per day.</p>



Receptor	Results
	Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.
R33	<p>Glare is predicted from PV2, PV3, PV5.1 and PV7 from Green Hill E.</p> <p>R33 is located outside the 1km screening distance of PV3, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2 Green Hill E in late June and from late August to early September between 03:30-06:00 for a maximum of 20 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R34-R36	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2, PV6 and PV7 from Green Hill E.</p> <p>R34-R36 are located outside the 1km screening distance of PV3, PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV3, PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV5.2 and PV6 Green Hill E from late March to late June and from early August to early February between 03:30-09:00 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R37	<p>Glare is predicted from PV2, PV3, PV5.1, PV5.2 and PV7 from Green Hill E.</p> <p>R37 is located outside the 1km screening distance of PV5.1 and PV7 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 and PV7 of Green Hill E.</p> <p>Glare is predicted from PV2, PV3 and PV5.2 Green Hill E from mid-March to early July and from late July to mid-October between 03:30-07:00 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R38-R39	<p>Glare is predicted from PV5.1, PV6 and PV7 from Green Hill E.</p> <p>R38-R39 are located outside the 1km screening distance of PV5.1 Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV5.1 Green Hill E.</p>



Receptor	Results
	<p>Glare is predicted from PV6 and PV7 Green Hill E from late March to mid-July and from early August to early September between 03:30-06:30 for a maximum of 40 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R40	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from early April to mid-July and from early August to early September between 03:30-06:00 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R41	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from mid-April to mid-July and from early August to early September between 03:30-05:30 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R42-R43	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from late April to mid-July and from early to late August between 03:30-05:30 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R44-R46	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>Glare is predicted from PV6 and PV7 Green Hill E from late April to mid-August between 03:30-05:00 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R47	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p>



Receptor	Results
	<p>Glare is predicted from PV6 and PV7 Green Hill E from late April to mid-July and in early August between 03:30-05:00 for a maximum of 20 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R48	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from early May to early July and in early August between 03:30-05:00 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R49	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from early May to early July between 03:30-05:00 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R50	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from mid-May to mid-July between 03:30-05:00 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R51	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from late May to mid-July between 03:30-05:00 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R52-R53	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>Glare is predicted from PV7 Green Hill E from early June to early July between 03:30-05:00 for a maximum of 15 minutes per day.</p>





Receptor	Results
	Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.
R54-R66	<b><i>No glare is predicted towards R54-R66</i></b>
R67	<p>Glare is predicted from PV8 from Green Hill E.</p> <p>R67 is located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p>
R68	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R68 is located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from early to mid-June and in early July between 20:00-20:30 for a maximum of 15 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R69-R70	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R69 is located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from late May to mid-June and from mid to late July between 19:30-20:30 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R71-R73	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R71-R73 are located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from early May to early June and from early to late July between 19:00-20:30 for a maximum of 30 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>



Receptor	Results
R74	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R74 is located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from early May to early June and from early July to early August between 19:00-20:30 for a maximum of 30 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R75	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R75 is located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from mid-April to early June and from early July to late August between 18:30-20:30 for a maximum of 35 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R76-R79	<p>Glare is predicted from PV6 and PV8 from Green Hill E.</p> <p>R76-R79 is located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p> <p>Glare is predicted from PV6 Green Hill E from late April to early June and from early July to late August between 18:30-20:30 for a maximum of 25 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>
R80-R82	<b>No glare is predicted towards R80-R82</b>
R83	<p>Glare is predicted from PV3, PV4, PV5.1, PV5.2, PV6 and PV8 from Green Hill E.</p> <p>R83 is located outside the 1km screening distance of PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV8 of Green Hill E.</p>



Receptor	Results
	<p>Glare is predicted from PV3, PV4, PV5.1, PV5.2 and PV6 Green Hill E from late January to early June, from early July to early August and from early September to mid-January between 15:30-20:30 for a maximum of 30 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R84	<p>Glare is predicted from PV1, PV3, PV4, PV5.1, PV5.2, PV6, PV7 and PV8 from Green Hill E.</p> <p>R84 is located outside the 1km screening distance of PV1, PV4, PV5.2, PV6, PV7 and PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1, PV4, PV5.2, PV6, PV7 and PV8 of Green Hill E.</p> <p>Glare is predicted from PV3 and PV5.1 Green Hill E from early March to mid-April, from mid-May to early June, from early July to late August and from early September to early October between 17:00-20:30 for a maximum of 25 minutes per day.</p> <p>As such, glare is predicted for less than 60 minutes per day but for more than three months of the year. Professional judgement and a review of additional considerations has been undertaken in Section 6.1.3.</p>
R85	<p>Glare is predicted from PV1, PV3, PV5.1, PV6, PV7 and PV8 from Green Hill E.</p> <p>R84 is located outside the 1km screening distance of PV1, PV5.1, PV6, PV7 and PV8 of Green Hill E. As such, a maximum impact magnitude of 'low impact' is assigned to glare predicted from PV1, PV5.1, PV6, PV7 and PV8 of Green Hill E.</p> <p>Glare is predicted from PV3 Green Hill E from early April to mid-May, from late May to early June, in late July and from early to late August between 18:30-20:30 for a maximum of 20 minutes per day.</p> <p>Based on industry guidance, glare predicted for less than 60 minutes per day and for less than 3 months of the year may be classified as 'low impact', and no further mitigation is recommended.</p>

Detailed results can be provided upon request.

With reference to impact significance guidance (Section 4.3.2.1), a 'no impact' significance may be classified where glare will not be visible from the assessed receptor. As such, no impacts are predicted to occur at R54-R66 and R80-R82.

With reference to impact significance guidance (Section 4.3.2.1), a 'low impact' may be classified where glare of any intensity occurs for less than 60 minutes per day and for less than 3 months per year. As such, low impacts are predicted to occur at R6, R8-R10, R31-R33, R47-R53, R67-R74, R76-R79 and R85.



With reference to impact significance guidance (Section 4.3.2.1), a ‘moderate impact’ may be classified where unmitigated glare of any intensity occurs for longer than 60 minutes per day, or for more than 3 months of the year. Residential dwellings R1-R5, R7, R11-R30, R34-R46, R75 and R83-R84 are predicted to receive glare for less than 60 minutes daily, however the incidence of glare is predicted to exceed 3 months. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.

### 6.1.3 Results Discussion

Additional factors have been considered to determine the residual impact significance at receptors R1-46, R75 and R80-R85. These include:

- Additional screening/obstructions; and
- The extent to which cloud cover and glare impacts coincide.

#### 6.1.3.1 Additional Screening/Obstructions

##### R1

Line of sight is obstructed between R1 and the reflecting area of Green Hill C PV1 by vegetation that is to form instant screening as part of embedded mitigation for the Landscape and Visual Impact Assessment. Additionally, line of sight towards PV2 and PV3 Green Hill C is expected to be obstructed by PV1 Green Hill C. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R1.

##### R2

Line of sight is obstructed between R2 and Green Hill C by nearby dense vegetation to the west of R2. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R2.

**Figure 6.1: Dense Vegetation between R2 and Green Hill C**



© Google Street View





### R3

Line of sight is obstructed between R3 and the reflecting area of PV2 and PV3 from Green Hill C and PV1 Green Hill D by vegetation that is to form instant screening as part of embedded mitigation for the Landscape and Visual Impact Assessment. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R3.

### R4

Line of sight is obstructed between R4 and Green Hill D by intervening vegetation bordering Highfield Road. Line of sight is also obstructed between R4 and Green Hill E by intervening vegetation to the north of Green Hill E PV1. As such, a maximum impact of ‘low impact’ may be classified towards R4 from Green Hill D and Green Hill E.

**Figure 6.2: Line of sight from R4 towards Green Hill C**



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**Figure 6.3: Line of sight from R4 towards Green Hill E**



© Google Satellite

**R5**

Line of sight is obstructed between R5 and the reflecting area of PV1 and PV2 from Green Hill E by vegetation that is to form instant screening as part of embedded mitigation for the Landscape and Visual Impact Assessment, and existing vegetation. As such, a maximum impact of 'low impact' may be classified towards R5 from Green Hill E.





Figure 6.4: Line of sight from R5 towards Green Hill E



R6-R14

Line of sight is obstructed between R6-R14 and Green Hill E by intervening residential dwellings and vegetation bordering Highfield Road. As such, a maximum impact of ‘low impact’ may be classified towards R6-R14 from Green Hill E.

Figure 6.5: Line of sight from R6-R14 towards Green Hill E



R15-R22

Line of sight between R15-R22 and Green Hill E is partially obstructed by vegetation to the east of the dwellings.



**Figure 6.6: Vegetation between R15-R22 and Green Hill E (dwellings to the left, Green Hill E to the right)**



### R23 – R25

Line of sight is obstructed between R23 – R25 and the reflecting area of PV2 Green Hill E by vegetation that is to form instant screening as part of embedded mitigation for the Landscape and Visual Impact Assessment, and existing vegetation. It is expected that line of sight from PV1, PV3 and PV4 Green Hill E towards R23 – R25 will be obstructed by PV2 Green Hill E.

Furthermore, line of sight between R23 and PV5.2 Green Hill E is obstructed by intervening vegetation, dwellings, farm buildings and topography. Additionally, it is noted that there are no windows at OP23 that face arrays PV1, PV2, or PV3 from Green Hill E.

As such, a maximum impact magnitude of ‘low impact’ may be classified towards R23 – R25.





Figure 6.7: Line of Sight from R23 to PV5.2 Green Hill E



© Google Street View

R26 and R37

Line of sight is obstructed between R26 and R37 and Green Hill E is obstructed by intervening vegetation, dwellings, farm buildings and topography. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R26.

Figure 6.8: Line of Sight from R26 and R37 to Green Hill E



© Google Street View



### R27-R30

Line of sight is obstructed between R27-R30 and Green Hill E is obstructed by dense vegetation aligning Wilby Road and vegetation to the west of Green Hill E PV5.2. As such, a maximum impact magnitude of 'low impact' may be classified towards R27-R30.

**Figure 6.9: Line of Sight between R27-R29 and Green Hill E**



© Google Street View

### R31

Line of sight is obstructed between R31 and Green Hill E is obstructed by intervening residential dwellings to the east and northeast. As such, a maximum impact magnitude of 'low impact' may be classified towards R31.

**Figure 6.10: Dense vegetation between R31 and Green Hill E**



© Google Street View





R32-R36

Line of sight is obstructed between R32-R36 and Green Hill E is obstructed by dense vegetation to the east and south of the dwellings. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R32-R36.

Figure 6.11: Vegetation between R32-R36 and Green Hill E



R37-R46

Line of sight is obstructed between R37-R46 and Green Hill E is partially obstructed by vegetation to the southwest of PV6 Green Hill E.

Figure 6.12: Line of Sight from R37-R46 to Green Hill E





## R75

Line of sight is obstructed between R75 and Green Hill E is obstructed by intervening farm buildings to the northwest of R75. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R75.

**Figure 6.13: Line of Sight from R75 to Green Hill E**



© Google Street View

## R81

Line of sight is obstructed between R81 and Green Hill E is obstructed by intervening infrastructure to the northwest of R81. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R81.

**Figure 6.14: Line of Sight from R81 to Green Hill E**





© Google Street View

### R83

Line of sight is obstructed between R83 and Green Hill E is obstructed by dense vegetation to the north and west of R83. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R83.

**Figure 6.15: Line of Sight from R83 to Green Hill E**



© Google Street View

### R84

Line of sight is obstructed between R84 and Green Hill E is obstructed by dense vegetation surrounding the dwelling. As such, a maximum impact magnitude of ‘low impact’ may be classified towards R84.

**Figure 6.16: Line of Sight from R84 to Green Hill E**



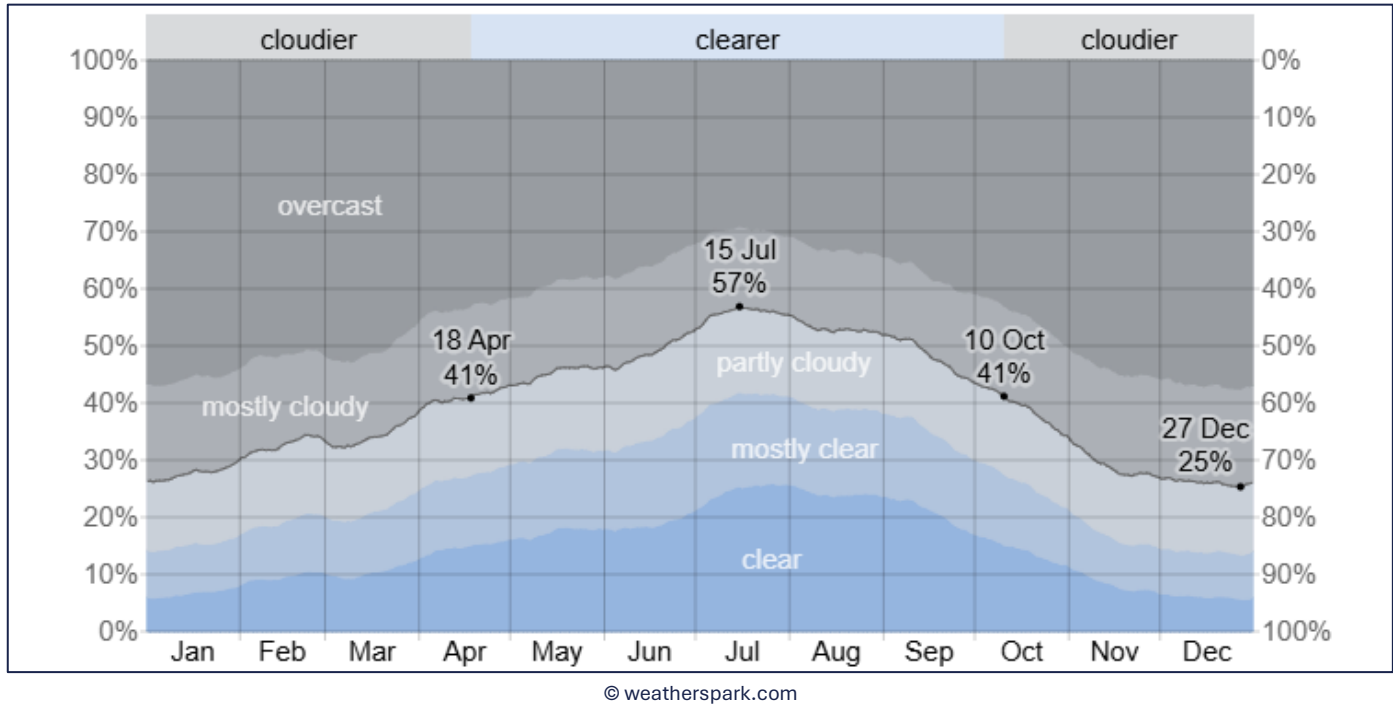
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6.1.3.2 Cloud Cover

As the worst-case approach, the model assumes clear sky conditions all year round. In the affected months (year-round) cloudier conditions (overcast and mostly cloudy) exist in Earls Barton (closest weather data available) for 43-75% of the time, as shown below in Figure 6.17.

Figure 6.17: Cloud Cover at Earls Barton



Considering the cloud cover that is likely to occur in the area, the modelled glare from the Scheme is likely to occur 43% less of often than predicted as a minimum.

6.1.4 Residual Impact

Receptor	Residual Impact	
	Fixed Panels	Tracking Panels
OP1	Low Impact (upon applying professional judgement)	Low Impact (upon applying professional judgement)
OP2	No Impact	Low Impact (upon applying professional judgement)
OP3	Low Impact (upon applying professional judgement)	Low Impact (upon applying professional judgement)
OP4	Low Impact (upon applying professional judgement)	Low Impact (upon applying professional judgement)
OP5	Low Impact (upon applying professional judgement)	Low Impact (upon applying professional judgement)



Receptor	Residual Impact	
	Fixed Panels	Tracking Panels
OP6	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b>
OP7	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP8	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b>
OP9	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b>
OP10	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b>
OP11	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP12	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP13	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP14	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP15	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP16	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP17	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP18	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP19	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP20	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP21	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP22	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP23	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)





Receptor	Residual Impact	
	Fixed Panels	Tracking Panels
OP24	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP25	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP26	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP27	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP28	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP29	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP30	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP31	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b>
OP32	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b>
OP33	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b>
OP34	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP35	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP36	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP37	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP38	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP39	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP40	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP41	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)





Receptor	Residual Impact	
	Fixed Panels	Tracking Panels
OP42	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP43	<b>Low Impact</b> (upon applying professional judgement)	<b>Low Impact</b> (upon applying professional judgement)
OP44	<b>Low Impact</b>	<b>Low Impact</b> (upon applying professional judgement)
OP45	<b>Low Impact</b>	<b>Low Impact</b> (upon applying professional judgement)
OP46	<b>Low Impact</b>	<b>Low Impact</b> (upon applying professional judgement)
OP47	<b>Low Impact</b>	<b>Low Impact</b>
OP48	<b>No Impact</b>	<b>Low Impact</b>
OP49		<b>Low Impact</b>
OP50		<b>Low Impact</b>
OP51		<b>Low Impact</b>
OP52		<b>Low Impact</b>
OP53		<b>Low Impact</b>
OP54		<b>No Impact</b>
OP55		<b>No Impact</b>
OP56		<b>No Impact</b>
OP57		<b>No Impact</b>
OP58		<b>No Impact</b>
OP59		<b>No Impact</b>
OP60		<b>No Impact</b>
OP61		<b>No Impact</b>
OP62		<b>No Impact</b>
OP63		<b>No Impact</b>
OP64		<b>No Impact</b>
OP65		<b>No Impact</b>
OP66		<b>No Impact</b>
OP67		<b>Low Impact</b>
OP68		<b>Low Impact</b>
OP69		<b>Low Impact</b>



Receptor	Residual Impact	
	Fixed Panels	Tracking Panels
OP70	No Impact	Low Impact
OP71	No Impact	Low Impact
OP72	No Impact	Low Impact
OP73	No Impact	Low Impact
OP74	Low Impact	Low Impact
OP75	Low Impact (upon applying professional judgement)	Low Impact (upon applying professional judgement)
OP76	Low Impact	Low Impact
OP77	Low Impact	Low Impact
OP78	Low Impact	Low Impact
OP79	Low Impact	Low Impact
OP80	Low Impact (upon applying professional judgement)	No Impact
OP81	Low Impact (upon applying professional judgement)	No Impact
OP82	Low Impact (upon applying professional judgement)	No Impact
OP83	Low Impact (upon applying professional judgement)	Low Impact (upon applying professional judgement)
OP84	Low Impact (upon applying professional judgement)	Low Impact (upon applying professional judgement)
OP85	Low Impact (upon applying professional judgement)	Low Impact

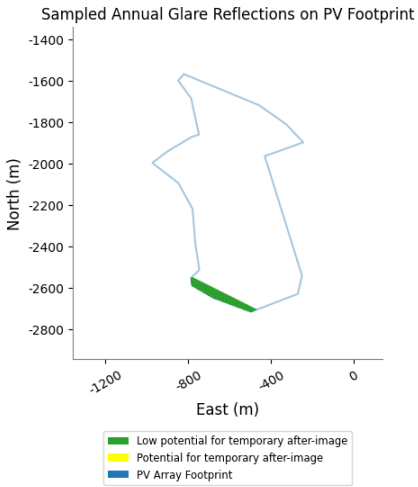

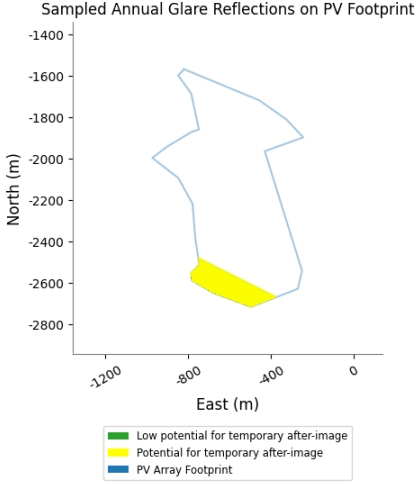

## 6.2 Road Infrastructure

### 6.2.1 Fixed Panel Results

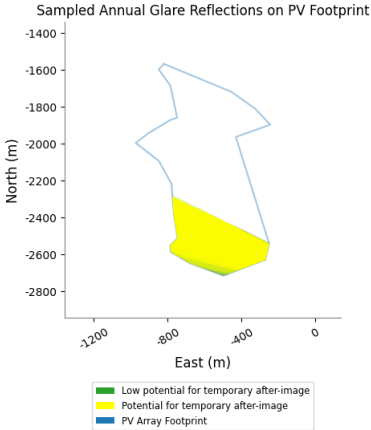
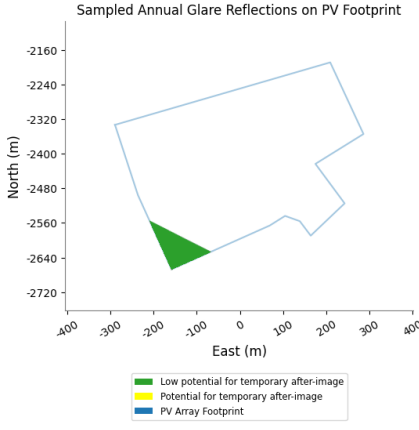

It is noted that the A4500 is outside the 1km screening distance of Green Hill C and Green Hill D. Based on industry guidance, the highest magnitude of impact possible from Green Hill C and Green Hill D will be a 'low impact'. As such, no further mitigation is required. It is also noted that the A4500 is outside the 1km screening distance of PV1, PV2, PV3, PV4, PV5.1, PV5.2 and PV8 from Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV1, PV2, PV3, PV4, PV5.1, PV5.2 and PV8 from Green Hill E will be a 'low impact'. As such, no further mitigation is required.

The below results show the area of the modelled PV arrays that is predicted glare compared to the 50° field of view of road users travelling at the corresponding observation points.



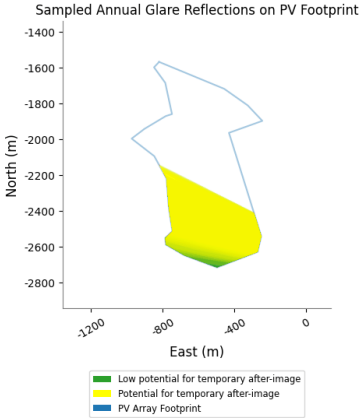
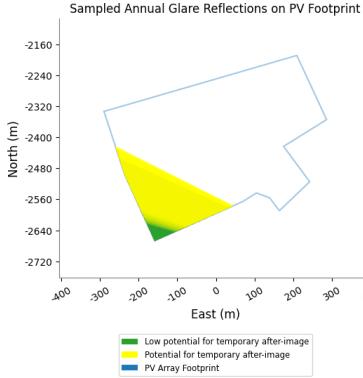

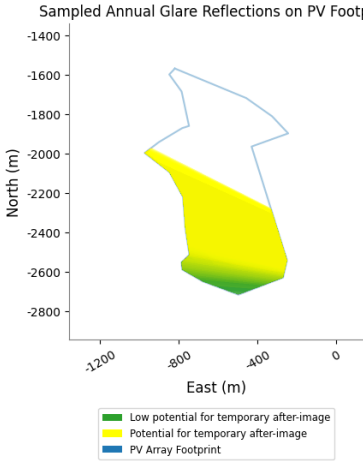
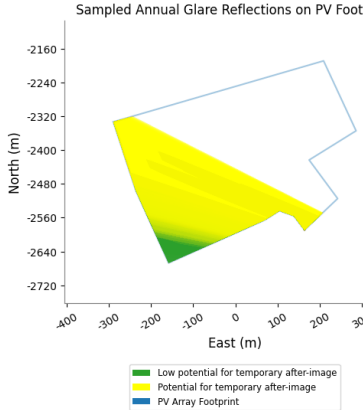
Receptor	Results
OP1 – OP15	<b>No glare predicted towards OP1 – OP15</b>
OP16	<p>Glare is predicted from PV6 Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <div><div><p>Green Hill E PV6:</p><p>Sampled Annual Glare Reflections on PV Footprint</p></div><div><p>50° FOV:</p></div></div> <p>As such, glare is predicted within the 50° field of view. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.</p>
OP17	<p>Glare is predicted from PV6 Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <div><div><p>Green Hill E PV6:</p><p>Sampled Annual Glare Reflections on PV Footprint</p></div><div><p>50° FOV:</p></div></div>



Receptor	Results
	As such, glare is predicted within the 50° field of view. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.
OP18	<b>No glare predicted towards OP18</b>
OP19	<p>Glare is predicted from PV6 and PV7 Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <div><div><p>Green Hill E PV6:</p><p>Sampled Annual Glare Reflections on PV Footprint</p><p>Green Hill E PV7:</p><p>Sampled Annual Glare Reflections on PV Footprint</p><p>50° FOV:</p></div><p>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of ‘low impact’. As such, a ‘low impact’ may be classified, and no further mitigation is recommended.</p></div>
OP20	<p>Glare is predicted from PV6 and PV7 Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p>





Receptor	Results
	<div><div><div><div><div>Green Hill E PV6:</div><div>Sampled Annual Glare Reflections on PV Footprint</div><div><div>Low potential for temporary after-image</div><div>Potential for temporary after-image</div><div>PV Array Footprint</div></div></div><div><div>Green Hill E PV7:</div><div>Sampled Annual Glare Reflections on PV Footprint</div><div><div>Low potential for temporary after-image</div><div>Potential for temporary after-image</div><div>PV Array Footprint</div></div></div><div><div>50° FOV:</div></div></div><div><p>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of ‘low impact’. As such, a ‘low impact’ may be classified, and no further mitigation is recommended.</p></div></div></div>
OP21	<div><div><div><div><div>Green Hill E PV6:</div><div>Sampled Annual Glare Reflections on PV Footprint</div><div><div>Low potential for temporary after-image</div><div>Potential for temporary after-image</div><div>PV Array Footprint</div></div></div><div><div>Green Hill E PV7:</div><div>Sampled Annual Glare Reflections on PV Footprint</div><div><div>Low potential for temporary after-image</div><div>Potential for temporary after-image</div><div>PV Array Footprint</div></div></div></div><div><p>Glare is predicted from PV6 and PV7 Green Hill E.</p><p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p></div></div></div>

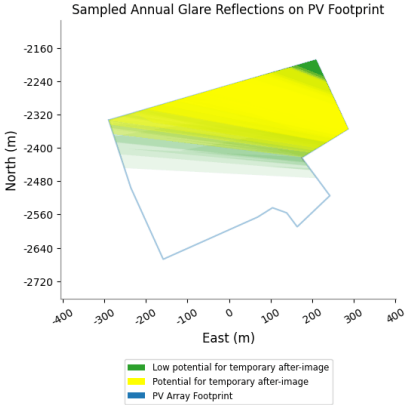

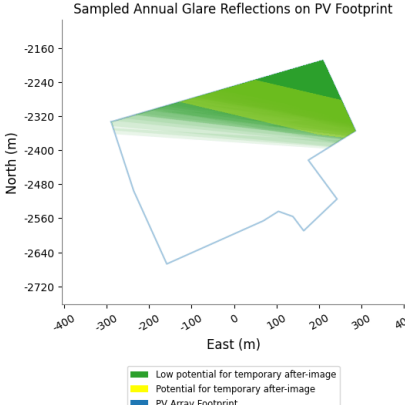



Receptor	Results
	<div>50° FOV:</div> <div></div> <div>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of ‘low impact’. As such, a ‘low impact’ may be classified, and no further mitigation is recommended.</div>
OP22	<div>Glare is predicted from PV6 and PV7 Green Hill E.</div> <div>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</div> <div><div><div>Green Hill E PV6:</div><div>Sampled Annual Glare Reflections on PV Footprint</div><div></div><div><div>Green Hill E PV7:</div><div>Sampled Annual Glare Reflections on PV Footprint</div><div></div></div><div>50° FOV:</div><div></div><div>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of ‘low impact’. As such, a ‘low impact’ may be classified, and no further mitigation is recommended.</div></div></div>



Receptor	Results
OP23	<p>Glare is predicted from PV6 from Green Hill E.</p> <p>It is noted that OP23 is outside the 1km screening distance of PV6 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 Green Hill E towards OP23 will be a 'low impact', and no further mitigation is recommended.</p>
OP24	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>It is noted that OP24 is outside the 1km screening distance of PV6 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 Green Hill E towards OP24 will be a 'low impact'.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <div> <div> <p><b>Green Hill E PV7:</b></p> <p>Sampled Annual Glare Reflections on PV Footprint</p>  </div> <div> <p><b>50° FOV:</b></p>  </div> </div> <p>As such, glare is predicted within the 50° field of view. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.</p>
OP25	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>It is noted that OP25 is outside the 1km screening distance of PV6 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 Green Hill E towards OP25 will be a 'low impact'.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p>



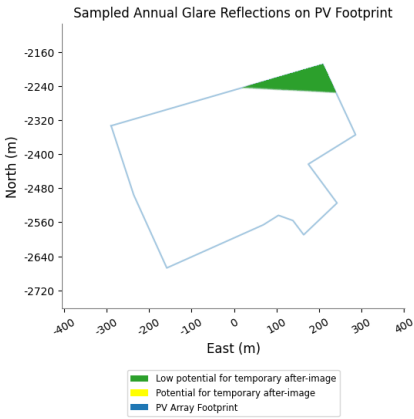

Receptor	Results
	<div><div><div><div>Green Hill E PV7:</div><div><div>Sampled Annual Glare Reflections on PV Footprint</div></div></div><div><div>50° FOV:</div></div></div><div><p>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of ‘low impact’. As such, a ‘low impact’ may be classified, and no further mitigation is recommended.</p></div></div>
OP26	<div><p>Glare is predicted from PV6 and PV7 from Green Hill E.</p><p>It is noted that OP26 is outside the 1km screening distance of PV6 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 Green Hill E towards OP26 will be a ‘low impact’.</p><p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p></div> <div><div><div><div>Green Hill E PV7:</div><div><div>Sampled Annual Glare Reflections on PV Footprint</div></div></div><div><div>50° FOV:</div></div></div><div><p>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of ‘low impact’. As such, a ‘low impact’ may be classified, and no further mitigation is recommended.</p></div></div>
OP27	<div><p>Glare is predicted from PV6 from Green Hill E.</p></div>





Receptor	Results
	<p>It is noted that OP27 is outside the 1km screening distance of PV6 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 Green Hill E towards OP27 will be a 'low impact', and no further mitigation is recommended.</p>
OP28	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>It is noted that OP28 is outside the 1km screening distance of PV6 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 Green Hill E towards OP28 will be a 'low impact'.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <div> <div> <p><b>Green Hill E PV7:</b></p> <p>Sampled Annual Glare Reflections on PV Footprint</p>  </div> <div> <p><b>50° FOV:</b></p>  </div> </div> <p>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of 'low impact'. As such, a 'low impact' may be classified, and no further mitigation is recommended.</p>
OP29	<p>Glare is predicted from PV6 and PV7 from Green Hill E.</p> <p>It is noted that OP29 is outside the 1km screening distance of PV6 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 Green Hill E towards OP29 will be a 'low impact'.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p>



Receptor	Results
	<div><div><div><div>Green Hill E PV7:</div><div><div>Sampled Annual Glare Reflections on PV Footprint</div></div></div><div><div>50° FOV:</div></div></div><div><p>As such, glare is predicted within the 50° field of view. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.</p></div></div>
OP30	<div><p>Glare is predicted from PV6 and PV7 from Green Hill E.</p><p>It is noted that OP30 is outside the 1km screening distance of PV6 and PV7 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV6 and PV7 Green Hill E towards OP30 will be a ‘low impact’, and no further mitigation is recommended.</p></div>

Detailed results can be provided upon request.

With reference to impact significance guidance (Section 4.3.2.1), a ‘no impact’ significance may be classified where glare will not be visible from the assessed receptor. As such, no impacts are predicted to occur at OP1 – OP15 and OP18.

With reference to impact significance guidance (Section 4.3.2.1), a ‘low impact’ may be classified where glare is predicted outside the 50° FOV of road users or at a distance of >1km. As such, low impacts are predicted to occur at OP19-OP23, OP25-OP28 and OP30.

With reference to impact significance guidance (Section 4.3.2.1), a ‘moderate impact’ may be classified where unmitigated glare is predicted inside the 50° FOV of road users. As such, moderate impacts are predicted to occur at OP16-OP17, OP24 and OP29. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.

6.2.2 Tracking Panel Results

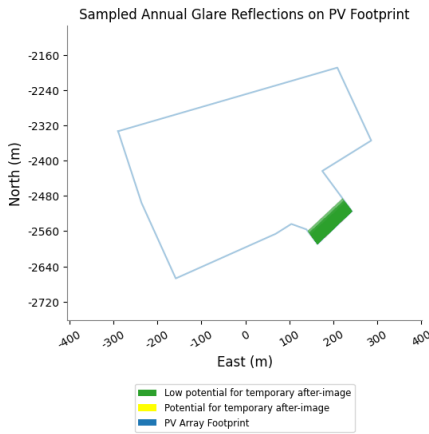

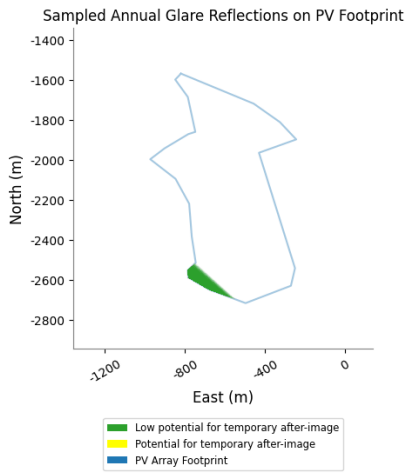

It is noted that the A4500 is outside the 1km screening distance of Green Hill C and Green Hill D. Based on industry guidance, the highest magnitude of impact possible from Green Hill C and Green Hill D will be a ‘low impact’. As such, no further mitigation is required. It is also noted that the A4500 is outside the 1km screening distance of PV1, PV2, PV3, PV4, PV5.1, PV5.2 and PV8 from Green Hill E. Based on industry guidance, the

highest magnitude of impact possible from PV1, PV2, PV3, PV4, PV5.1, PV5.2 and PV8 from Green Hill E will be a 'low impact'. As such, no further mitigation is required.

The below results show the area of the modelled PV arrays that is predicted glare compared to the 50° field of view of road users travelling at the corresponding observation points.

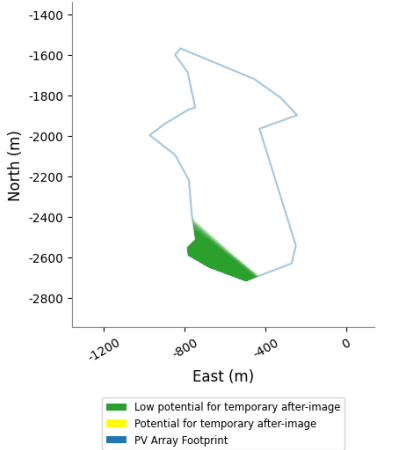

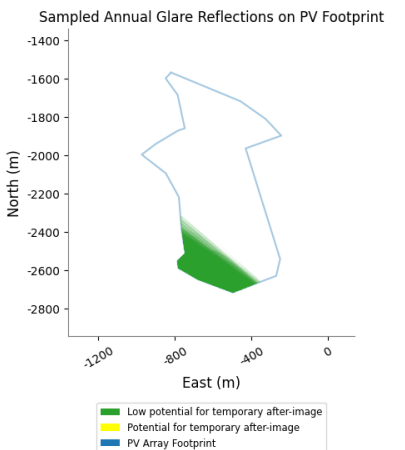

Receptor	Results
OP1	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>It is noted that OP1 is outside the 1km screening distance of PV7 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV7 Green Hill E towards OP1 will be a 'low impact', and no further mitigation is recommended.</p>
OP2	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>It is noted that OP2 is outside the 1km screening distance of PV7 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV7 Green Hill E towards OP2 will be a 'low impact', and no further mitigation is recommended.</p>
OP3	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>It is noted that OP3 is outside the 1km screening distance of PV7 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV7 Green Hill E towards OP3 will be a 'low impact', and no further mitigation is recommended.</p>
OP4	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>It is noted that OP4 is outside the 1km screening distance of PV7 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV7 Green Hill E towards OP4 will be a 'low impact', and no further mitigation is recommended.</p>
OP5	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p>



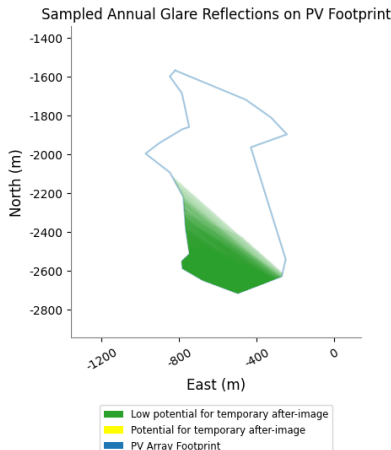

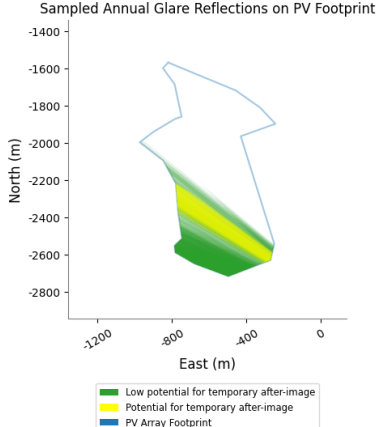

Receptor	Results
	<p><b>Green Hill E PV7:</b></p>  <p><b>50° FOV:</b></p>  <p>As such, glare is predicted within the 50° field of view. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.</p>
OP6-OP12	<p><b>No glare predicted towards OP6 – OP12</b></p>
OP13	<p>Glare is predicted from PV6 from Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <p><b>Green Hill E PV6:</b></p>  <p><b>50° FOV:</b></p>  <p>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of 'low impact'. As such, a 'low impact' may be classified, and no further mitigation is recommended.</p>
OP14	<p>Glare is predicted from PV6 from Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p>



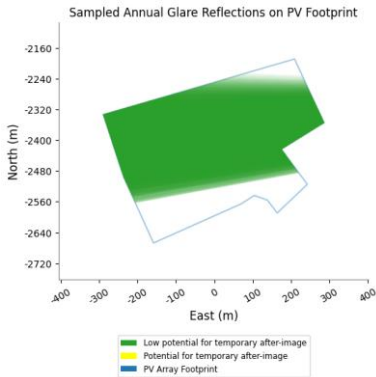



Receptor	Results
	<p><b>Green Hill E PV6:</b></p> <p>Sampled Annual Glare Reflections on PV Footprint</p>  <p><b>50° FOV:</b></p>  <p>Based on industry guidance, the highest magnitude of impact possible from glare that originates outside the 50° field of view is of 'low impact'. As such, a 'low impact' may be classified, and no further mitigation is recommended.</p>
OP15	<p>Glare is predicted from PV6 from Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <p><b>Green Hill E PV6:</b></p> <p>Sampled Annual Glare Reflections on PV Footprint</p>  <p><b>50° FOV:</b></p>  <p>As such, glare is predicted within the 50° field of view. Professional judgement and a review of additional considerations has been undertaken in Section 6.2.3.</p>
OP16	<p>Glare is predicted from PV6 from Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p>



Receptor	Results
	<p><b>Green Hill E PV6:</b></p> <p>Sampled Annual Glare Reflections on PV Footprint</p>  <p><b>50° FOV:</b></p>  <p>As such, glare is predicted within the 50° field of view. Professional judgement and a review of additional considerations has been undertaken in Section 6.2.3.</p>
OP17	<p>Glare is predicted from PV6 from Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p> <p><b>Green Hill E PV6:</b></p> <p>Sampled Annual Glare Reflections on PV Footprint</p>  <p><b>50° FOV:</b></p>  <p>As such, glare is predicted within the 50° field of view. Professional judgement and a review of additional considerations has been undertaken in Section 6.2.3.</p>
OP18-OP28	<b>No glare predicted towards OP18-OP28</b>
OP29	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>The area of the modelled PV array that is predicted glare, and the 50° field of view at the corresponding observation points is shown below.</p>



Receptor	Results
	<div><div><div><div>Green Hill E PV7:</div><div><div>Sampled Annual Glare Reflections on PV Footprint</div></div></div><div><div>50° FOV:</div></div></div><p>As such, glare is predicted within the 50° field of view. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.</p></div>
OP30	<p>Glare is predicted from PV7 from Green Hill E.</p> <p>It is noted that OP30 is outside the 1km screening distance of PV7 Green Hill E. Based on industry guidance, the highest magnitude of impact possible from PV7 Green Hill E towards OP30 will be a ‘low impact’, and no further mitigation is recommended.</p>

Detailed results can be provided upon request.

With reference to impact significance guidance (Section 4.3.2.1), a ‘no impact’ significance may be classified where glare will not be visible from the assessed receptor. As such, no impacts are predicted to occur at OP6-OP12 and OP18-OP28.

With reference to impact significance guidance (Section 4.3.2.1), a ‘low impact’ may be classified where glare is predicted outside the 50° FOV of road users or at a distance of >1 km. As such, low impacts are predicted to occur at OP1-OP4, OP13-OP14 and OP30.

With reference to impact significance guidance (Section 4.3.2.1), a ‘moderate impact’ may be classified where unmitigated glare is predicted inside the 50° FOV of road users. As such, moderate impacts are predicted to occur at OP5, OP15-OP17 and OP29. Based on industry guidance, professional judgement is applied and further review of factors not included within the model are considered in Section 6.1.3.

### 6.2.3 Results Discussion

Mitigating factors have been considered to determine the residual impact significance at receptors OP5, OP15 – OP17, OP24 and OP29. These include:

- Additional screening/obstructions; and
- The extent to which cloud cover and glare impacts coincide.

#### 6.2.3.1 Additional Screening/Obstructions

##### OP5

Unmitigated glare is predicted inside the 50° FOV of road users from PV7. Dense vegetation aligning the A4500 is expected to obstruct line of sight between road users and the reflecting area of PV7. As such, a maximum impact magnitude of 'low impact' may be classified.

**Figure 6.18: Line of Sight from OP5 towards PV7**



© Google Street View





### OP15

Unmitigated glare is predicted inside the 50° FOV of road users from PV6. It is considered that line of sight between the road users and the reflecting area of PV6 is likely to be obstructed by intervening topography and farm buildings. As such, a maximum impact magnitude of 'low impact' may be classified.

**Figure 6.19: Line of sight from OP15 towards PV6**



### OP16

Unmitigated glare is predicted inside the 50° FOV of road users from PV6. It is considered that line of sight between the road users and the reflecting area of PV6 is likely to be obstructed by intervening topography. As such, a maximum impact magnitude of 'low impact' may be classified.



Figure 6.20: Line of sight from OP16 towards PV6



OP17

Unmitigated glare is predicted inside the 50° FOV of road users from PV6. It is considered that line of sight between the road users and the reflecting area of PV6 is likely to be obstructed by intervening topography and vegetation aligning the A4500. As such, a maximum impact magnitude of ‘low impact’ may be classified.

Figure 6.21: Line of sight from OP17 towards PV6



OP24





Unmitigated glare is predicted inside the 50° FOV of road users from PV7. Dense vegetation aligning the A4500 is expected to obstruct line of sight between road users and the reflecting area of PV7. As such, a maximum impact magnitude of ‘low impact’ may be classified.

Figure 6.22: Line of sight from OP24 towards PV7



OP29

Unmitigated glare is predicted inside the 50° FOV of road users from PV7. Dense vegetation aligning the A4500 is expected to obstruct line of sight between road users and the reflecting area of PV7. As such, a maximum impact magnitude of ‘low impact’ may be classified.

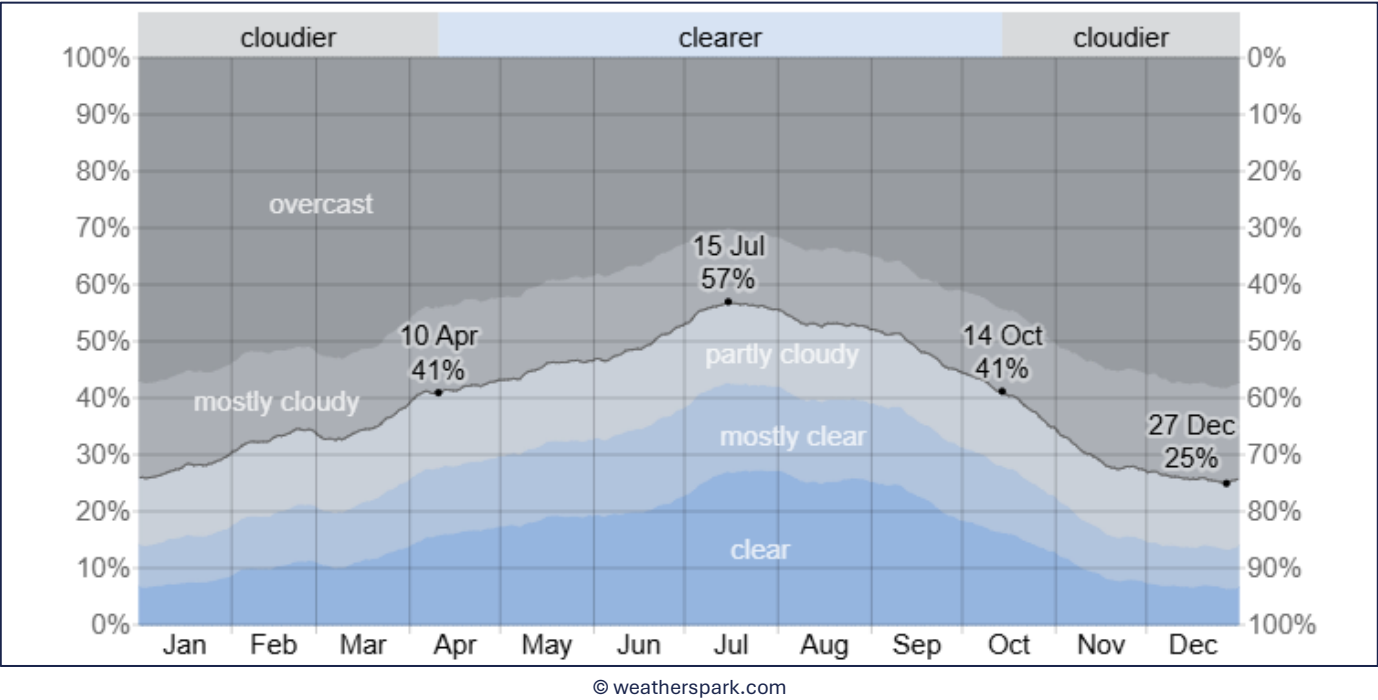
Figure 6.23: Line of sight from OP29 towards PV7



6.2.3.2 Cloud Cover

As the worst-case approach, the model assumes clear sky conditions all year round. In the affected months (March to September) cloudier conditions (overcast and mostly cloudy) exist in Early Barton (closest weather data available) for 43-65% of the time, as shown below in Figure 6.24.

Figure 6.24: Cloud Cover in Earls Barton



Considering the cloud cover that is likely to occur in the area, the modelled glare from the Scheme is likely to occur 43% less of often than predicted as a minimum.

6.2.4 Residual Impact

Receptor	Residual Impact	
	Fixed Panels	Tracking Panels
OP1	No Impact	Low Impact
OP2	No Impact	Low Impact
OP3	No Impact	Low Impact
OP4	No Impact	Low Impact
OP5	No Impact	Low Impact (upon applying professional judgment)
OP6	No Impact	No Impact
OP7	No Impact	No Impact
OP8	No Impact	No Impact





Receptor	Residual Impact	
	Fixed Panels	Tracking Panels
OP9	No Impact	No Impact
OP10	No Impact	No Impact
OP11	No Impact	No Impact
OP12	No Impact	No Impact
OP13	No Impact	Low Impact
OP14	No Impact	Low Impact
OP15	No Impact	Low Impact (upon applying professional judgment)
OP16	Low Impact (upon applying professional judgment)	Low Impact (upon applying professional judgment)
OP17	Low Impact (upon applying professional judgment)	Low Impact (upon applying professional judgment)
OP18	No Impact	No Impact
OP19	Low Impact	No Impact
OP20	Low Impact	No Impact
OP21	Low Impact	No Impact
OP22	Low Impact	No Impact
OP23	Low Impact	No Impact
OP24	Low Impact (upon applying professional judgment)	No Impact
OP25	Low Impact	No Impact
OP26	Low Impact	No Impact
OP27	Low Impact	No Impact
OP28	Low Impact	No Impact
OP29	Low Impact (upon applying professional judgment)	Low Impact (upon applying professional judgment)
OP30	Low Impact	Low Impact



## 7. Conclusions

Modelling was undertaken as part of the ES Chapter Technical Appendix for Green Hill Solar Farm for ground-based receptors nearby to Green Hill C, Green Hill D and Green Hill E.

Glare was predicted from fixed panels towards 58 of the 85 modelled residential dwellings. Upon applying professional judgement and consideration of additional factors, a 'low impact' was classified at all modelled residential dwellings.

Glare was predicted from tracking panels towards 59 of the 85 modelled residential dwellings. Upon applying professional judgement and consideration of additional factors, a 'low impact' was classified at all modelled residential dwellings.

Glare from fixed panels was predicted towards 14 of the 30 modelled observation points along the A4500. A 'low impact' was classified at all the affected observation points, and no further mitigation is recommended.

Glare from fixed panels was predicted towards 12 of the 30 modelled observation points along the A4500. A 'low impact' was classified at all the affected observation points, and no further mitigation is recommended.

It is recommended that the current screening outlined within this report is maintained to an appropriate height and density such that it obstructs line of sight between the assessed receptors and proposed arrays.



## Appendices



## **Appendix A: Assumptions, Limitations & Fixed Model Variables**





1. The sun position and glare analysis will be determined throughout the year on a 1-minute basis.
2. The maximum amount of solar power striking surface normal to the sun per unit area (Peak direct normal irradiance, DNI) is set at 1,000 W/m<sup>2</sup>. This will be scaled for each time step to account for changing sun position.
3. The average subtended angle of the sun as viewed from earth is 9.3 mrad.
4. The ocular transmission coefficient for the radiation that is absorbed in the eye before reaching the retina, is set to 0.5.<sup>19,20</sup>
5. Observer pupil diameter is set at the typical value of 0.002 m for daylight.<sup>19,20</sup>
6. Eye focal length for the distance between the nodal point (where rays intersect in the eye) and the retina is set at the typical value of 0.017 m.<sup>19,20</sup>
7. 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, models have been validated 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.<sup>21</sup>
8. The algorithm assumes that the PV array is aligned with a plane defined by the total heights (ground elevation plus PV array height) of the coordinates outlined in the Google map.
9. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors. As such, calculated DNI may vary from actual DNI experienced by observer.
10. The system output calculation is a DNI-based approximation that assumes clear, sunny skies all year-round.
11. Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
12. Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
13. Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
14. PV array tracking assumes the modules move instantly when tracking the sun, and when reverting to the rest position.

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<sup>19</sup> 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.

<sup>20</sup> Stiney, D.H. and B.C. Freasier, 1973, Evaluation of Optical Radiation Hazards, Applied Optics, 12(1), p. 1-24.

<sup>21</sup> [REDACTED]



## **Appendix B: Dwelling Receptor Details**



Receptor	Latitude (°)	Longitude (°)	Receptor	Latitude (°)	Longitude (°)
1	52.30613	-0.78321	45	52.2749	-0.76705
2	52.31118	-0.75896	46	52.27455	-0.76661
3	52.30826	-0.76082	47	52.2741	-0.76601
4	52.30358	-0.75644	48	52.27382	-0.76536
5	52.29912	-0.76476	49	52.27348	-0.76495
6	52.29387	-0.77538	50	52.27325	-0.76432
7	52.29359	-0.77477	51	52.27282	-0.76371
8	52.2935	-0.77379	52	52.27273	-0.763
9	52.29367	-0.77284	53	52.27249	-0.76083
10	52.29406	-0.77217	54	52.27214	-0.7601
11	52.29417	-0.77141	55	52.27179	-0.75945
12	52.29399	-0.77089	56	52.27156	-0.75899
13	52.29432	-0.77017	57	52.27066	-0.75799
14	52.29395	-0.76978	58	52.27047	-0.75707
15	52.29338	-0.7693	59	52.2706	-0.75644
16	52.2929	-0.76932	60	52.27069	-0.75586
17	52.29258	-0.76955	61	52.27081	-0.75531
18	52.29246	-0.76924	62	52.27132	-0.75662
19	52.2922	-0.7691	63	52.27164	-0.75539
20	52.29196	-0.76844	64	52.27322	-0.75629
21	52.29214	-0.76869	65	52.27333	-0.7556
22	52.2917	-0.76858	66	52.27342	-0.75503
23	52.29182	-0.76716	67	52.27331	-0.75458
24	52.29141	-0.76844	68	52.27361	-0.75471
25	52.29129	-0.76802	69	52.27388	-0.75481
26	52.29093	-0.76806	70	52.27392	-0.75424
27	52.29087	-0.76716	71	52.27399	-0.75377
28	52.29031	-0.76809	72	52.27406	-0.75335
29	52.29057	-0.76744	73	52.29083	-0.76795



Receptor	Latitude (°)	Longitude (°)	Receptor	Latitude (°)	Longitude (°)
30	52.29009	-0.76857	74	52.27413	-0.75274
31	52.29001	-0.76987	75	52.27422	-0.75233
32	52.28905	-0.77005	76	52.27439	-0.75187
33	52.2895	-0.7718	77	52.27511	-0.74678
34	52.28974	-0.7737	78	52.27453	-0.74648
35	52.28953	-0.7742	79	52.27483	-0.74663
36	52.2894	-0.77481	80	52.27417	-0.74638
37	52.27782	-0.77029	81	52.27382	-0.7461
38	52.27722	-0.76977	82	52.27879	-0.74529
39	52.2767	-0.76924	83	52.27999	-0.74882
40	52.27635	-0.76882	84	52.28008	-0.74269
41	52.27608	-0.76849	85	52.28944	-0.74616
42	52.27571	-0.76806	86	52.28858	-0.7348
43	52.27545	-0.76772	87	52.28912	-0.73294
44	52.27522	-0.76742	-	-	-





## **Appendix C: Road Receptor Details**



A4500

Receptor	Latitude (°)	Longitude (°)	Receptor	Latitude (°)	Longitude (°)
<b>1</b>	52.27058	-0.77102	<b>16</b>	52.27491	-0.75024
<b>2</b>	52.2709	-0.76965	<b>17</b>	52.27527	-0.7489
<b>3</b>	52.27114	-0.76824	<b>18</b>	52.27568	-0.74759
<b>4</b>	52.27138	-0.76683	<b>19</b>	52.27621	-0.74641
<b>5</b>	52.27174	-0.76548	<b>20</b>	52.27687	-0.74543
<b>6</b>	52.27209	-0.76413	<b>21</b>	52.2776	-0.74457
<b>7</b>	52.27243	-0.76278	<b>22</b>	52.27827	-0.7436
<b>8</b>	52.27275	-0.76141	<b>23</b>	52.2788	-0.74241
<b>9</b>	52.27306	-0.76003	<b>24</b>	52.27932	-0.74122
<b>10</b>	52.27338	-0.75866	<b>25</b>	52.27981	-0.73999
<b>11</b>	52.27366	-0.75727	<b>26</b>	52.28028	-0.73874
<b>12</b>	52.2739	-0.75586	<b>27</b>	52.28079	-0.73753
<b>13</b>	52.27412	-0.75444	<b>28</b>	52.28132	-0.73636
<b>14</b>	52.27436	-0.75303	<b>29</b>	52.28194	-0.73529
<b>15</b>	52.27462	-0.75162	<b>30</b>	52.28247	-0.73411

