

## BOW17.1451: Crow Wood Solar Array – Lighting Strategy

### Introduction

The following lighting strategy has been produced for and on behalf of Kirkwells Planning Consultant to discharge pre-commencement Planning Condition 7 requested by Burnley Borough Council (Planning Application No. FUL/2023/0332). The application is for the proposed erection of a solar farm comprising 1978 panels, transformer housing, CCTV and boundary fencing (central NGR: SD 83095 34205). Condition 7 is worded as follows:

*“No external lighting, including lighting required for construction and decommissioning, shall be installed at the site until such time as a lighting strategy for biodiversity has been submitted to and approved in writing by the local planning authority. All external lighting shall be installed in accordance with the details agreed in the strategy and shall be maintained thereafter in accordance with the agreed details, subject to any such variation that may be agreed with the Local Planning Authority. No additional external lighting shall be installed without prior written consent from the local planning authority.*

*Reason: To avoid harm to any wildlife, to protect the biodiversity of the site and to protect the character of the green belt and open countryside in accordance with Policy NE1 of Burnley’s Local Plan (July 2018)”*

Bowland Ecology undertook a Preliminary Ecological Appraisal (PEA) to inform the proposals. The PEA established the site’s dominant habitat as modified grassland which offers low suitability to be used by foraging bats providing a limited diversity in prey species. However, the adjacent off site boundary habitats such as woodlands provide higher suitability for use by foraging and commuting bats. The woodland edges provide linear features favoured by more common bat species such as common and soprano pipistrelle. Foraging / commuting bats are therefore likely to be present on Site. BT1 (See appendix A) provides potential bat roosting habitat on the southern boundary. In addition, site adjacent woodland habitats provide sheltering, foraging and commuting opportunities for small mammals, birds and common amphibians. The proposed hedgerow planting on the site’s southern boundary offers the opportunity to create additional bat foraging habitat on site as well as foraging and sheltering opportunities for small mammals, birds and common amphibians. As such these ecological features should be protected from potential adverse impacts resulting from lighting. This report presents a Lighting Strategy to ensure possible adverse impacts to wildlife from lighting are minimised.

### Lighting Strategy

The overall impact of lighting on wildlife associated with the solar array is anticipated to be minimal with no permanent lighting anticipated during the operational phase. However, there is a low risk of impacts resulting from nocturnal artificial lighting during the construction phase. As such, where nocturnal lighting is to be used or should proposals be altered to include permanent lighting installations, the following recommendations and strategies should minimise any adverse impacts to wildlife as a result of the scheme.

- The artificial lighting of BT1 (‘high’ potential bat roost tree) may lead to the loss of viable roosting opportunities on site due to bats aversion to light and increased risk of avian predation of roosts if present. As

such no artificial lighting should be installed within 5 m of BT1 (see Appendix A for 5 m lighting buffer zone) and no lighting should be installed which faces BT1 leading to its illumination.

- Artificial lighting can adversely impact the feeding behaviour of bats by dissuading the use of established commuting and foraging routes. Commuting and foraging habitats for bat species which favour ‘edge’ habitats are present in the form of woodland edges at the north and west. As such artificial lighting of these key habitats should be avoided and an appropriate lighting and glare buffer zone of 5 m adhered to (see Appendix A for approximate key habitat buffer zones). This will ensure the retention of ecologically functional ‘dark corridors’ within the scheme and any established bat foraging / commuting flight lines throughout the operational phase of the solar array.
- The newly created hedgerow, to be planted on the site’s southern boundary offers an opportunity to enhance the site’s potential for use by foraging / commuting bats, small mammals, birds and common amphibians. As such the artificial lighting of this newly created habitat should be avoided during the operational phase of the solar array.
- Where lighting is to be installed, appropriate luminaire specifications should be considered when installing these artificial light sources. Examples of these considerations include:
  1. All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used.
  2. A warm white light source (2700 Kelvin or lower) should be adopted to reduce blue light component.
  3. Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt.

Further luminaire specifics to consider when installing artificial lighting are provided in appendix B.

## Conclusion

The installation of artificial lighting has the potential to adversely impact on a range of wildlife. To avoid these potential adverse impacts, the scheme should seek to avoid the artificial illumination of the identified potential bat roosting habitat (BT1) and key boundary habitats with potential to be used by bats, birds, small mammals and common amphibians. The scheme should also avoid the illumination of the proposed hedgerow creation which will increase the sheltering / commuting / foraging opportunities for a range of wildlife onsite.

**Prepared by:** Sam Robinson, BA (Hons), QCIEEM.

**QA:** Matt Clifford, MSc, BSc (Hons), ACIEEM

## References:

BOW17\_1451 Crow Road Solar Array PEA\_June 2023\_FINAL – Bowland Ecology 2023.

Guidance Note GN08/23 Bats and Artificial Lighting at Night - The Institute of lighting professionals and Bat Conservation Trust.

## Appendix A – Lighting Strategy Plan



## Appendix B - Appropriate Luminaire Specifications

Light sources, lamps, LEDs and their fittings come in a myriad of different specifications. However, the following should be considered when choosing luminaires and their potential impact on Key Habitats and features as outlined within 'Guidance Note 08/23: Bats and Artificial Lighting At Night 30 Institution of Lighting Professionals':

- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability
- A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component Guidance Note 08/23: Bats and Artificial Lighting At Night 30 Institution of Lighting Professionals
- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (*Stone, E.L., Jones, G., Harris, S. (2012). Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats. Glob. Change Biol. 18, 2458–2465.*)
- Internal luminaires can be recessed (as opposed to using a pendant fitting - See Figure 5) where installed in proximity to windows to reduce glare and light spill
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges
- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered - See ILP GN01
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt
- Where appropriate, external security lighting should be set on motion-sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1- or 2-minute timer is likely to be appropriate
- Use of a Central Management System (CMS) with additional web-enabled devices to light on demand
- Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely