

From: [PMO](#)
To: [Wylfa Newydd](#)
Subject: RE: IACC Deadline 2 Submission : Local Impact Report - Lighting (email 20)
Date: 04 December 2018 19:46:48
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[Lighting.pdf](#)

Please note, a number of emails will follow in relation to the LIR – we will confirm the final e-mail.

Pnawn Da/ *Good afternoon,*

Gweler ynghlwm cynrychiolaeth CSYM mewn perthynas â'r uchod / *Please see IACC's representation in respect of the above.*

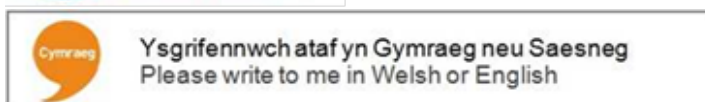
Bydd fersiwn Gymraeg yn cael ei ddarparu cyn gynted a phosib / *A Welsh version of the submission will be provided in due course.*

Cofion/ *Regards,*
Manon

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Mae'r neges e-bost hon a'r ffeiliau a drosglwyddyd ynghlwm gyda hi yn gyfrinachol ac efallai bod breintiau cyfreithiol ynghlwm wrthynt. Yr unig berson sydd 'r hawl i'w darllen, eu copio a'u defnyddio yw'r person y bwriadwyd eu gyrru nhw ato. Petaech wedi derbyn y neges e-bost hon mewn camgymeriad yna, os gwelwch yn dda, rhowch wybod i'r Rheolwr Systemau yn syth gan ddefnyddio'r manylion isod, a pheidiwch datgelu na chopio'r cynnwys i neb arall.

Mae cynnwys y neges e-bost hon yn cynrychioli sylwadau'r gyrrwr yn unig ac nid o angenrheidrwydd yn cynrychioli sylwadau Cyngor Sir Ynys Môn. Mae Cyngor Sir Ynys Môn yn cadw a diogelu ei hawliau i fonitro yr holl negeseuon e-bost trwy ei rwydweithiau mewnol ac allanol.

Croeso i chi ddelio gyda'r Cyngor yn Gymraeg neu'n Saesneg. Cewch yr un safon o wasanaeth yn y ddwy iaith.

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THE ISLE OF Anglesey

Wylfa Newydd Local Impact Report

Chapter 12: Lighting

December 2018

PINS Ref: EN010007



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1.0 Lighting

1.1 Context

- 1.1.1 The Isle of Anglesey is predominantly a rural county and still has some of the darkest skies in the United Kingdom. This is demonstrated in the Anglesey Dark Skies Report¹ that was published in 2014 and summarised in the Anglesey Night Sky Quality Baseline Assessment produced in 2015². Dark skies are increasingly seen as being attractive to residents and visitors, therefore IACC consider that it important that the natural dark skies of Anglesey are preserved and where possible, enhanced.
- 1.1.2 Poorly designed lighting schemes can result in what is commonly known as ‘light pollution’, which can have adverse effects on human health. Invasive lighting can also have a detrimental impact on biodiversity and can have adverse impacts upon some valued perceptual characteristics of designated landscapes and defined landscape and seascape character areas.
- 1.1.3 Anglesey has many environmental and landscape designations such as the Area of Outstanding Natural Beauty (AONB), Sites of Special Scientific Interest (SSSI), Special Areas of Conservation and Specially Protected Areas. It should also be noted that parts of Anglesey are covered by a local landscape designation: Special Landscape Areas (SLAs). The extents of the AONB and the SLA in the vicinity of the WNDA are shown on Figure D10-7 in the WNDA Development Figure Booklet³.
- 1.1.4 The development of Wylfa Newydd would result in the addition of new light sources to the area and accordingly has the potential to result in light pollution. The DCO only provides details of the lighting sources proposed for the Wylfa Newydd Development Area (WNDA).
- 1.1.5 The proposed arrangements to managing such light pollution have been published by Horizon in its DCO application. The proposed approach is set out in the following documents:
- a) 6.4.67 Volume D – WNDA Development App D10-10 – Environmental Lighting Impact Assessment;⁴
 - b) Volume 8 - 8.6 Wylfa Newydd Code of Construction Practice – in particular chapter 4.5 – site lighting – which confirms the aims and objectives of the projects construction lighting design.⁵
 - c) Volume 8 - 8.13 Wylfa Newydd Code of Operational Practice - in particular chapter 4.3 – site lighting – which confirms the aims and objectives of the projects operational lighting design.⁶

¹ Matthew Parkes. 2014. Anglesey Dark Skies – Report prepared for Isle of Anglesey AONB and Natural Resources Wales [\(Link\)](#)

² John Rowlands. 2015. Anglesey Night Sky Quality Baseline Quality Assessment – Summary of Findings and Recommendations. [\(Link\)](#)

³ Examination Library Reference APP-237

⁴ Examination Library Reference APP-201

⁵ Examination Library Reference APP-414

⁶ Examination Library Reference APP-421

- 1.1.6 Horizon's Environmental Lighting Impact Assessment (ELIA) considers the potential environmental impacts of lighting at the three project stages i.e. construction, operation and decommissioning.
- 1.1.7 Horizon's overall position is as follows:
- 1.1.8 The WNDA development will result in the introduction of new light sources with the potential to result in light pollution affecting surrounding residential, ecological and astronomy receptors. The different light sources will include;
- a) Construction phase – For the construction phase, based on information provided by Horizon, it is understood that the likely light sources would be as follows: mobile lighting units at approximately 9m height, crane lighting at 30m height, high-mast lighting at approximately 20-30m height, column-mounted area lighting luminaires at 10m height, building-mounted luminaires and low-level lighting.
 - b) Operational phase – For the operational phase, no outline lighting proposals have been provided by Horizon.
 - c) Decommissioning phase - For the decommissioning phase, whilst no outline lighting proposals have been provided by Horizon, they do consider that the lighting effects during the Decommissioning stage are expected to be similar to those during the Construction phase. The lighting proposals (albeit employing future lighting technology) can therefore be considered as being reasonably the same as those for the Construction phase. However, no decommissioning lighting will exist for the Site Campus as this would have been removed upon completion of the Proposed Development.
- 1.1.9 IACC has confirmed its vision to obtain Dark Sky Community Status via the International Dark-Sky Association (IDA). However the submission of the application is currently delayed. As part of the process of preparing the application, IACC is working with partners from the Joint Advisory Committee. A baseline study of dark sky quality of the island was prepared by Dark Sky Wales Training Services which included surveys undertaken during December 2017 and January 2017 on clear and moonless nights. The findings of the study are presented in the 'Ynys Mon Isle of Anglesey Sky Quality Survey'. As part of the application a Lighting Strategy will be prepared.
- 1.1.10 In view of protecting the landscape adjacent communities and ecology as well as assisting in achieving potential future dark status, it is important that any lighting impacts associated with the Proposed Power Station are adequately and robustly assessed. In view of this, the ELIA should include a 'no-development' scenario assessment based on a potential future ILP E0 Environmental Zone⁷ which would reflect the proposed Dark Sky Community Status and the presence of the AONB close to the Proposed Power Station.
- 1.1.11 In addition to the ELIA, IACC considers that it would be beneficial for Horizon to present a Lighting Management Plan for the construction and operation of the Proposed Power Station which includes giving specific reference to dark-skies.

⁷ Institution of Lighting Professional. 2013. Professional Lighting Guide 04 – Guidance on Undertaking Environmental Lighting Impact Assessments. [\(Link\)](#)

1.2 Impacts and Evidence Base

Residential

1.2.1 The Council during its review of the ELIA has identified the following as key issues that undermine the robustness of the ELIA for residential receptors:

- a) Use of inappropriate ILP Environmental Zones for Cemaes (and Tregle);
- b) Lack of suitable baseline illuminance measurements;
- c) Lack of information provided with regard to the assessed outline lighting scheme(s);
- d) Lack of quantitative predictions at point receptors;
- e) Absence of a robust temporal assessment; and
- f) Reduction of magnitudes of change and therefore adverse residual effects by qualitative 'judgement' following the introduction of mitigation measures such as the inclusion of earth bunds.

1.2.2 IACC consider that a robust assessment against the baseline lighting conditions will be provided by adopting the most appropriate ILP Environmental Zone for residential receptors in Cemaes. However, in certain situations the ELIA would benefit from the use of baseline illuminance measurements at (or positions representative of) edge of settlement dwellings and at residential properties located outside these settlements. In this manner the ELIA could robustly demonstrate the level of available headroom to accommodate light spill from the Proposed Power Station (particularly for the Construction phase). IACC consider that Horizon's baseline assessment is weak because the derivation of the ILP Environmental Zone is generally by means of observations with regard to the level of optical control to local light sources and light presence associated with the Existing Power Station. IACC require that the baseline conditions are defined in strict accordance with national guidance i.e. ILP GN01: Guidance Notes for the Control of Obtrusive Light (2011)⁸ and ILP PLG 04: Guidance on Undertaking Environmental Lighting Impact Assessments (2013)⁷. Horizon's adopted baseline methodology is, in many parts, in direct conflict with national guidance; specifically, with regard to the methodology as set out in Page 12 of ILP PLG 04⁷.

1.2.3 Due to the issues identified above with the ELIA that forms part of the DCO application, the IACC concludes a negative impact on the residential receptors of Cemaes and Tregle from obstructive lighting during construction and operation phases.

Ecological

1.2.4 The ELIA has assessed 'Neutral' impacts during the Construction phase for light spill affecting ecological receptors. This assessment is based upon the premise that light spill onto ecological receptors would be reduced to below thresholds where significant effects would be generated. It is proposed that this outcome would be achieved via implementation of the General Site Management Strategy. IACC is unable to agree with this conclusion and disagrees with the robustness of the ELIA. The Council

⁸ Institution of Lighting Professionals. 2011. Guidance Notes for the Control of Obtrusive Light ([Link](#))

during its review of the ELIA has identified the following key issues that undermine the robustness of the ELIA for ecological receptors:

- a) Appropriate design of construction lighting would only be achieved 'where practicable';
- b) Adoption of suitable colour temperatures is not robustly set out;
- c) Positive benefits of 'additional mitigation' (particularly at Cemlyn Bay) have been derived by qualitative 'judgement' only;
- d) Lack of clarity as to which impact magnitude criteria have been used;
- e) Use of averaging illuminance levels over large calculation planes; and
- f) Absence of a robust temporal assessment.

1.2.5 IACC consider that a robust assessment against the baseline lighting conditions can only be provided by undertaking suitable baseline illuminance measurements at suitable locations for the light-sensitive ecological receptors. Whilst baseline measurements to the quite obviously 'dark' locations are not considered strictly necessary, it is considered that such measurements would be of benefit to locations where there are nearby existing retained light sources e.g. the bat barn north of Tregle. Whilst it is considered reasonable to assume baseline levels of illuminance in the order of 0.00 lux to many locations, and in turn consider that (based on a 0.1 lux criterion) the ecological receptor will be able to absorb the impact of the lighting source; it is considered that some ecological receptors located close to existing retained light sources may have a lower ability to absorb such increased impacts due to higher baseline levels of illuminance.

Dark Skies

- 1.2.6 As the general brightness of the night sky is variable with respect to time dependent effects and prevailing weather conditions it is not IACC's intention to request measurements of the baseline sky brightness, nor to consider historical satellite mapping of such. However, IACC consider that it would be beneficial to (very broadly) quantify the level of upward light from the existing lighting scheme in a simplified manner. Further details of a potential method of doing so are presented later in this document.
- 1.2.7 Horizon have identified Negative impacts during the Construction and Operation phases for obtrusive light affecting the dark skies within the ELIA study area.
- 1.2.8 Whilst IACC does not necessarily disagree with this conclusion, it is unable to have a suitable level of confidence in the conclusion, as it disagrees with the robustness of the ELIA. The general commitment in the ELIA to adopting luminaires with a 0° uplift and resultant 0% ULR is welcomed; however, there is insufficient outline information on potential magnitudes and durations of deliberate upward temporary lighting required. Further such information is therefore required. Given the inadequacies of the ELIA assessing this impact as negative does however represent the likely worst case and that rating should be accepted for the purposes of this report and to inform the development of mitigation.
- 1.2.9 Whilst a broad assessment has been undertaken based on the presence of the Existing Power Station, it is considered that it would be useful to also present a dark

skies assessment based on a 'No-Development' baseline scenario with the ongoing decommissioning of the Existing Power Station. The robustness of the dark skies assessment could also be improved by broadly quantifying the levels of upward light for each phase in comparison to the Existing Power Station baseline.

- 1.2.10 Potential negative impacts associated with the Proposed Power Station include adverse interactive lighting and socio-economic effects due to the introduction of new light sources and the associated risks to achieving Dark Sky Community status via IDA.

1.3 Policy Position

- 1.3.1 Criterion 1 of Policy PS 9 Wylfa Newydd and related development, which is the overarching Policy for the Wylfa Newydd Project, expects the proposal to be shaped by any relevant Policies in the Plan and any relevant supplementary planning guidance.
- 1.3.2 Based on the issues raised in this Chapter of the LIR, the requirements set out in criteria 8, 13 and 16 of Policy PS 9 are of particular relevance:
- 1.3.3 Criterion 8 expects the scheme's layout and design to avoid, minimize, mitigate or compensate for a range of impacts on the local and wider area, in the short and longer term. The range of impacts include visual and ecological impacts.
- 1.3.4 Criterion 13 sets out an expectation that communities are compensated for the burden and disturbance imposed on them by hosting the project.
- 1.3.5 Criterion 16 sets out an expectation that the developer provides a review mechanism in order to monitor the full range of impacts, to review the adequacy of mitigation or compensation measures and to make adjustments as necessary.
- 1.3.6 In light of the issues raised in this Chapter of the LIR, the requirements of the following Policies need to be considered:
- 1.3.7 Criterion 7 of Policy PCYFF 2, which sets out the presumption against development that would have an unacceptable adverse impact on the health, safety or amenity of occupiers of local residences, other land and property uses or characteristics of the locality due to increased activity, disturbance, vibration, noise, dust, fumes, litter, drainage, light pollution, or other forms of pollution or nuisance.
- 1.3.8 Policy ISA 1 Infrastructure provision sets out an expectation that a financial contribution would be made to secure improvements (subject to the relevant tests), including related works, where they are necessary to make proposals acceptable.
- 1.3.9 The SPG provides detailed advice about the application of Policies in the JLDP in relation to the Wylfa Newydd project. The following Guiding Principles (GP) are of particular relevance within the context of this Chapter:
- 1.3.10 GP7 Protecting health, which clarifies the expectations in relation to issues such as monitoring of potential impacts, including in respect of light pollution;
- 1.3.11 GP26 Implementation and monitoring, which sets an expectation for a robust monitoring framework that will include monitoring the light levels experienced by sensitive receptors, such as residents and ecological receptors.

1.4 Gaps in Information

- 1.4.1 IACC considers that the ELIA contains a number of information gaps and shortcomings that need to be addressed:

Classification of Environmental Zone(s)

- 1.4.2 IACC is not in agreement with the adopted classifications of Environmental Zones. Tregele has been classified as Environmental Zone E3 by Horizon; Tregele is representative of an E2 Environmental Zone. Irrespective of this variance, the ILP Guidance Notes⁷ are quite explicit regarding Environmental Zone boundaries and states the following: *'Where an area to be lit lies on the boundary of two zones the obtrusive light limitation values used should be those applicable to the most rigorous zone.'* Therefore, irrespective of whether Tregele were classified as an E2 or E3 Environmental Zone, its surroundings are certainly E2, or even E1 and therefore, Tregele residential receptors should be assessed against this baseline accordingly. Adoption of the guidance serves to protect the residential properties at the boundary of settlements like Tregele where there is a 'dark' outlook. It also potentially benefits residential properties not at the boundary by potential provision of better control of sky-glow and glare where there is potential for residents to possess a line of sight to the light sources i.e. lighting within the WNDA.
- 1.4.3 Cemaes has been classified as Environmental Zone E3 in the ELIA. However, as set out above, irrespective of whether Cemaes is an E3 or an E2 Environmental Zone, its surroundings are certainly E2, or even E1 and therefore, Cemaes residential receptors should be considered accordingly.
- 1.4.4 IACC request that Tregele and Cemaes are assessed against the obtrusive light criteria as set out for an E2 Environmental Zone. The post-curfew criteria shall be adopted between the hours of 23:00 and 07:00.
- 1.4.5 As with the visual impact assessment⁹ the ELIA does not include assessment of impacts at residential properties located outside the main settlements (or communities) and effects upon their residents. IACC considers that this is an important omission. ILP Guidance⁷ is that isolated properties should be assessed on the basis that they are located in ILP Environmental Zone E1 with commensurately lower thresholds for significant adverse lighting impacts to be sustained.

Baseline Illuminance

- 1.4.6 IACC is not in agreement with the robustness of the baseline light surveys undertaken. IACC request that baseline vertical illuminance measurements are undertaken at residential properties (or positions representative of) on the edge of Tregele and Cemaes which face the WNDA. The measurements shall be used to demonstrate that there is sufficient available headroom to accommodate light spill that will be generated by the construction and operation of the Proposed Power Station, particularly where construction lighting is proposed in close proximity to these settlements e.g. the main laydown area and Tregele. Appropriate measurements shall be undertaken at locations agreed with IACC using a suitably calibrated illuminance meter to a 0.00 lux or better precision.

⁹ Examination Library Reference APP-129.

Assessed Schemes of Lighting

1.4.7 It is appreciated that details of the Proposed Power Station are still in development. However, irrespective of being outline and for the purposes of the ELIA, there is a distinct lack of information provided with regard to the lighting proposals that have been used in the ELIA. IACC request that CAD drawings are provided of the assessed schemes of lighting with the following information: The drawings shall include

- a) Mapping of the ELIA study area;
- b) The Proposed Power Station site layout;
- c) The modelled luminaire positions; plus
- d) Luminaire type, the mounting height, the luminaire aim angle and the angle of luminaire uplift if greater than 0°.

Quantitative Assessment

1.4.8 IACC request that the following obtrusive light metrics are predicted at agreed point receptors located at residential properties on the boundaries of Tregale and Cemaes facing the Proposed Power Station site, along with at isolated residential properties to be agreed with IACC:

- a) Vertical illuminance (lux); and
- b) Viewed source intensity (candelas)

1.4.9 The predictions shall be adopted to determine the impact magnitudes. A table of impact magnitude criteria which relates directly to ILP criteria is required. The predictions shall model all light sources which have the potential to result in significant cumulative illuminance contribution to the baseline local modelled light sources, and those with the potential to yield a maximum viewed source intensity at the assessed receptor locations.

1.4.10 In assessing sky-glow affecting residential receptors, as residential receptors are unlikely to be designated observation points for dark-skies, IACC consider it reasonable that the residential 'sky-glow' assessment is based entirely on the relevant upward lighting ratio (ULR) criterion for the Environmental Zone of the residential receptor. However, as a point of clarity, this is not the case for dark-skies receptors generally.

1.4.11 It is noted that within the ELIA, the list of effects considered includes light source intensity / glare; however, it appears that no qualitative predictions have been provided and no justification provided for this omission. This is despite the potential for adverse significant effects to arise from the use of the proposed outline high intensity luminaire types¹⁰.

Temporal Assessment

1.4.12 IACC request that the temporal nature of effects is assessed more robustly. In doing so, it may be considered reasonable to reduce some of the significance ratings for

¹⁰ For residential receptors light source intensity is effectively used as a measure of glare, for which different limits apply according to Environmental Zone within which the residential receptor is located i.e. the background luminance.

residual effects that are of short-term temporary duration. e.g. mound construction works which may result in exceedances of ILP criteria.

- 1.4.13 The IACC would suggest that Construction period is subdivided to cover Years 1 and 2 as separate from remainder of construction period as proto Mounds A and E will not be complete until end of Year 2 (and will then reduce light spill for some receptors).

Intervening landform/earth mounds

- 1.4.14 IACC are not satisfied with the robustness of the predicted residual effects where embedded and good design mitigation / addition mitigation is employed, or where the positive screening effects associated with intervening landform, earth mounds etc. are included in the assessment. This concern is because for most receptors included in the ELIA, only a qualitative judgement has been applied as to the effectiveness of the mitigation measures / screening. For the sake of robustness, IACC request that quantitative modelling is undertaken which adequately incorporates the proposed mitigation measures / considered screening.

Implementation of Control Measures for Construction Lighting

- 1.4.15 IACC do not consider that the implementation of control measures for construction lighting is sufficiently robust. Specifically, it is stated that the appropriate design of construction lighting would only be achieved 'where practicable'. It is accepted that there will be situations where it may be impracticable to implement certain control measures in certain situations, however, specifics of such potential outline situations are required, along with a definition of 'where practicable'. For instances of impracticability, the expected residual effects should be determined on an informed qualitative basis.

Light Source Colour Temperatures

- 1.4.16 Although there is mention throughout the ELIA of adopting suitable light source colour temperatures, no firm commitments are set out. IACC request that firm commitments are made for adopted light source colour temperatures. The following are recommended by IACC:
- a) 2700K limit for construction lighting within close vicinity of bat and marine receptors (onshore & nearshore works);
 - b) 3000K limit within outer construction zones;
 - c) 4000K limit for central construction zone high-mast luminaires; and
 - d) 3000K limit for all operational lighting (save specific localised safety/security critical areas where high colour rendition is essential).
- 1.4.17 There is mention of using red light sources within the vicinity of bat receptors and the use of 'green' light sources in the vicinity of migratory birds. The use of such lighting is welcomed; however, a robust risk assessment would be required to maintain safe and suitable working conditions due to the reduced colour rendering properties of such light sources.

Ecological Impact Magnitude Criteria

- 1.4.18 Although numerical criteria are used in the ELIA of light spill affecting ecological receptors, no clear ecological impact magnitude criteria are provided. IACC request that ecological impact magnitude criteria are provided along with robust justifications for adopting such thresholds.
- 1.4.19 It is of particular concern that in assessing the potential lighting effects at Cemlyn Bay, 3.5 and 14 fold average and maximum exceedances respectively of the 0.1 lux criterion have been considered to represent a 'small adverse' magnitude of change.

Ecological Calculation Planes

- 1.4.20 Robust justification should be provided with regard to the suitability of the heights and linear extents of the adopted ecological receptor calculation planes. For example, by stating typical flightline heights by bat species. In many instances, the level of illuminance is significantly higher closer to ground level, or say in close proximity to a localised light source than the calculated average levels of illuminance might imply. IACC therefore consider that either the maximum levels of illuminance are adopted, and/or, calculation planes are suitably segmented according to the levels of illuminance diversity.
- 1.4.21 IACC request that CAD drawings are provided of the ecological calculation planes. The drawings shall include mapping of the study area, the Proposed Power Station site layout, the height of the calculation planes and the calculation plane references.

Compliance Monitoring

- 1.4.22 IACC require Horizon to commit to undertaking compliance monitoring throughout the Construction phase. This shall be undertaken at key ecological and residential receptors to be agreed with IACC in consultation with NRW and shall include illuminance measurements, subjective assessment of viewed source intensity, assessment of ULR for individual light sources by inspection and daytime / night-time photography.

Dark Skies

- 1.4.23 IACC consider that it would be beneficial to (very broadly) quantify the level of upward light from the existing lighting scheme in a simplified manner, say, direct upward light component based on task illuminance, ground reflected light component based on task illuminance and weighting this according to area lit. This could then be repeated for the Proposed Power Station Construction and Operation periods, allowing for a reasonably robust comparative study to be undertaken based on the existing operational scenario. The positive effects of introducing dimming, switch-offs and altering structure/landscaping Light Reflectance Values (LRVs) could then be broadly quantified using this methodology.
- 1.4.24 IACC also consider that it would be beneficial to consider a scenario of 'No-Development' (Existing Power Station removed) Vs Proposed Power Station (Construction and Operation).

Dimming

- 1.4.25 As part of embedded mitigation measures, the ability to dim light sources (subject to safety requirements) if required has been included within the ELIA. IACC are

concerned that only the ability to introduce dimming is set out within the assessment. IACC request that a firm commitment to implement such dimming is made. This shall take the form of a Programme of Dimming. The programme shall be produced in conjunction with Horizon's Lighting Consultant and shall set out the various construction zones, work phases and activities. The programme shall set out the levels of dimming to be employed. CAD drawings shall be supplied setting out the various dimming zones.

Site Campus Lighting

- 1.4.26 IACC are particularly concerned with the robustness of the ELIA undertaken for the Site Campus lighting and the associated potential ecological impacts. It is stated that during construction of the Site Campus, potential maximum illuminance levels near the bat barn will be 0.77 lux and 0.89 lux (presumably from exterior lighting only) during construction and operation respectively. It is of significant concern that such magnitudes have been assessed as resulting in a 'small adverse' magnitude of change for a bat roost. ILP Guidance note 08/18: Bats and Artificial Lighting in the UK¹¹ confirms "...where 'complete darkness' on a feature or buffer is required, it may be appropriate to consider this to be where illuminance is below 0.2 lux on the horizontal plane and below 0.4 lux on the vertical plane. These figures are still lower than what may be expected on a moonlit night...." Really, levels of 0.00 lux should be targeted for maternity and hibernation roosts. However, it is further reported that the screening afforded to intervening retained planting has not been incorporated into the lighting model; it is accepted that this is relatively standard practice. Notwithstanding, a more detailed qualitative assessment is required to robustly demonstrate that the residual light levels will be in the order the ILP illuminance levels. For example, by reporting light source heights relative to screening heights, detailed photographs showing the density of growth during seasons without leaf and specific input from the Horizon's Arboricultural Consultant as necessary, to include tree survey plans. Where intervening screening is to be relied upon, the risks associated with a reduction in screening due to management of the trees (including potential removal/loss of, including cumulatively with other developments, particularly the NGET scheme which will affect the Dame Sylvia Crowe woodland) shall be taken into consideration and alternative means of mitigation proposed. In addition to this, it is expected that suitable light monitoring would be undertaken during the course of the Construction period and at pre-completion stage for the Operation period.
- 1.4.27 It has been stated that the ELIA is based on effects after 21:00 hours when the Multi-use games area (MUGA) is not in operation, as this would have a direct effect on light levels at the bat barn. Again, this is of significant concern as irrespective of emergence times, no consideration has been given to the levels of light spill falling on the in-use bat barn for the pre-21:00 hours scenario. It may be useful for Horizon to consider factors such as seasonal daylight availability, periods of hibernation and protection of the roost ingress and egress points.
- 1.4.28 It does not appear that the light spill contribution from interior lighting sources associated with the Site Campus has been included within the predicted illuminance levels at the bat barn. It is considered that there is a potential for significant levels of interior light spill from the Amenity Building and Accommodation Blocks. Whilst it is recognised that Horizon has proposed the incorporation of control measures such as

¹¹ ILP Guidance Note 8 Bats and Artificial Lighting ([Link](#))

blinds into Site Campus design, there is a need to provide a firm commitment to do so and provide a robust management & monitoring plan for the proper implementation of such measures. The use of large areas of glazed elements or translucent walling should not be present on the Amenity Building facing the adjacent light-sensitive receptors, unless modelling of interior light sources is undertaken to demonstrate acceptability. Rooflights would also require due consideration.

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