



Deucheran Hill 2

Volume 3, Appendix 13.1 Aviation Lighting Scheme

Our Reference: WPAC 027a/26

Your Reference: Deucheran Hill 2 EIA 4300061352-S1-U95

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Reference Documents

- A. Civil Aviation Publication (CAP) 764 Civil Aviation Authority (CAA) Policy and Guidance on Wind Turbines Version 7, Dec 2025
- B. Air Navigation Order (ANO) Article 222
- C. CAA Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level dated 01/06/17
- D. International Civil Aviation Organisation (ICAO) Annex 14 Vol 1 Chapter 6
- E. MOD Obstruction Lighting Guidance Document 01 Jan 2020
- F. Landscape Institute Guidance on Landscape and Visual Impact Assessment Version 3
- G. NatureScot Guidance on Aviation Lighting Impact Assessment dated November 2024
WPAC Aviation Lighting Report 027a/26 V2.0 dated 03/04/26

Scope

1. This report proposes a lighting design that is compliant with regulations and guidance contained within References A to G as discussed with the CAA and the MOD. It explains the rationale behind the lighting design taking into account the requirement to minimise the number of turbines illuminated with aviation obstruction lights whilst maintaining flight safety and provides a detailed assessment of the brilliance of the lighting when viewed from a number of viewpoints provided by the LVIA consultant after consultation with the relevant stakeholders including the Local Planning Authority. Part 2 of the report identifies and explains those mitigation measures that can be utilised to minimise the environmental effect of the lights including an assessment of the historical meteorological data from which to predict the luminous intensity requirements for the lights. The entire report can be considered to fulfil the requirements for an Aviation Lighting Landscape and Visual Impact Mitigation Plan and can be used to inform the Landscape and Visual Impact Assessment as recommended in the guidance laid down in the Landscape Institutes Guidelines for Visual Impact Assessment Version 3 (GLVIA3).

Part 1 Turbine Lighting Layout Design

Lighting Layout Starting Point and Assumptions

2. The Applicant is proposing a 14-turbine wind farm on the Deucheran Hill, Kintyre. The site will be located just to the west of the existing Deucheran Hill turbine site and Deucheran communications mast. The turbines themselves will be located across the Lorgie and Deucheran Hills which sit each side of Gleann Drochaide.

3. From a civil aviation perspective, the proposed turbine site is located 27km north of Campbeltown Airport and 64km west of Prestwick Airport. The turbines will be clear of Air Traffic Control Areas/Zones (CTA/CTZ) and Terminal Management Areas (TMA). Accordingly, the airspace around and above the Deucheran site is classified by the CAA as unrestricted (Class G) airspace.



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4. Conversely, Deucheran Hill 2 is in MOD Low Flying Area (LFA) 14 by day. This area is the largest and most utilised low flying training airspace available to both MOD and NATO aircraft. The area of Deucheran Hill 2 converts to Night Allocated Region (NAR) 2B during the hours of darkness. Although primarily a fast jet training area, the airspace is also used by both military and civilian helicopters by day and night. Military fast jet and tactical transport aircraft operate down to 250ft (30m) above ground level in LFA 14. Helicopters routinely operate down to 100ft (30m) and on occasion ground level. Civilian aircraft will also operate in the area of Deucheran Hill by day and night and this will include helicopters from the Coastguard, Helicopter Emergency Medical Services (HEMS), Police and Air Ambulance.

Lighting Assessment Overview

- From a CAA perspective Deucheran Hill 2 is sited outside controlled airspace and away from airports and airfields. As a result, it will be assessed against visible lighting in accordance with Class G 'en-route' airspace requirements as detailed in CAP 764 (latest draft).
- To accommodate MOD requirements, the site will be assessed for Night Vision Goggles (NVG) compatible lighting in accordance with MOD published obstruction lighting specifications.
- Where possible the recommended final lighting configuration will be optimised to reduce light impact on the local area.
- CAA obstruction lighting dispensations that are currently offered where flight safety can be maintained will be included.
- The Deucheran Hill 2 Proposed Development is for 14 turbines: three at 220, four at 200, seven at 180. There is also a Met Mast at 120m to tip.



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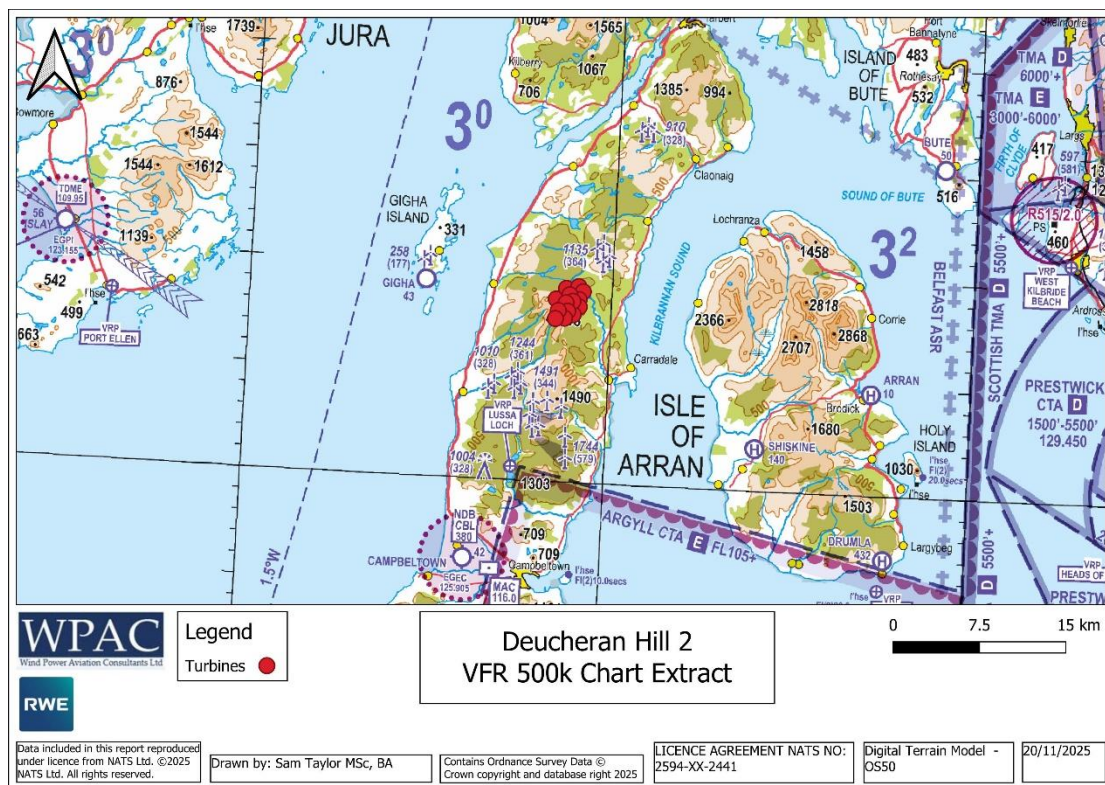


Figure 1 Deucheran Hill 2 on an aviation chart

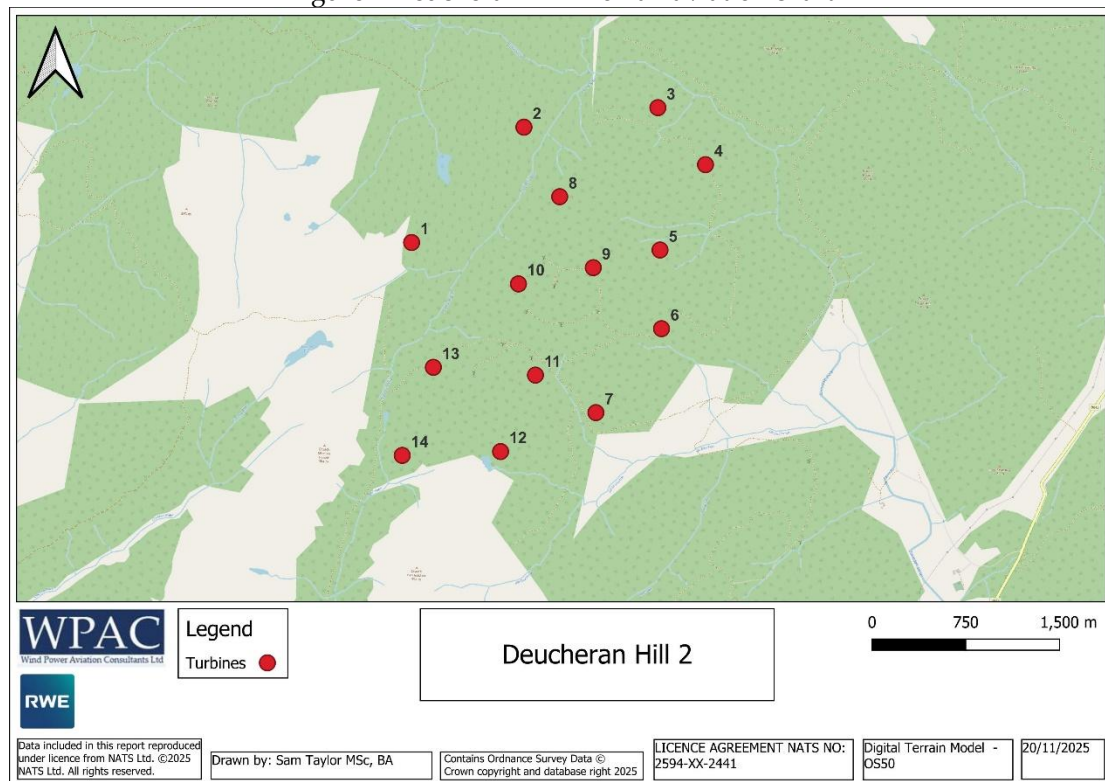


Figure 2 Deucheran Hill 2

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CAA-ANO Red 2000/200cd Lighting (In compliance with CAA CAP 764 - Draft)

5. In accordance with the CAP 764 (draft) conditions, the CAA requires:
- That all perimeter turbines be lit unless removing a light will leave a gap of less than 900m total between the remaining lit turbines.
 - That any turbine within 200m of a 'string perimeter' be lit unless the distance between adjacent turbines is less than 900m total.
 - Note: additional spacing dispensation is sometimes available for the above criteria.
 - That any unlit turbine does not exceed a 10° up-slope from adjacent lit turbines.
 - No turbine shall be more than 1800m (1nm) from a lit turbine.
6. Applying these criteria dictates that 10 turbines of the Deucheran Hill 2 site would require ANO visible red lighting.

Turbines with 2000/200cd Lights: T1, T2, T3, T4, T5, T6, T7, T12, T13 and T14

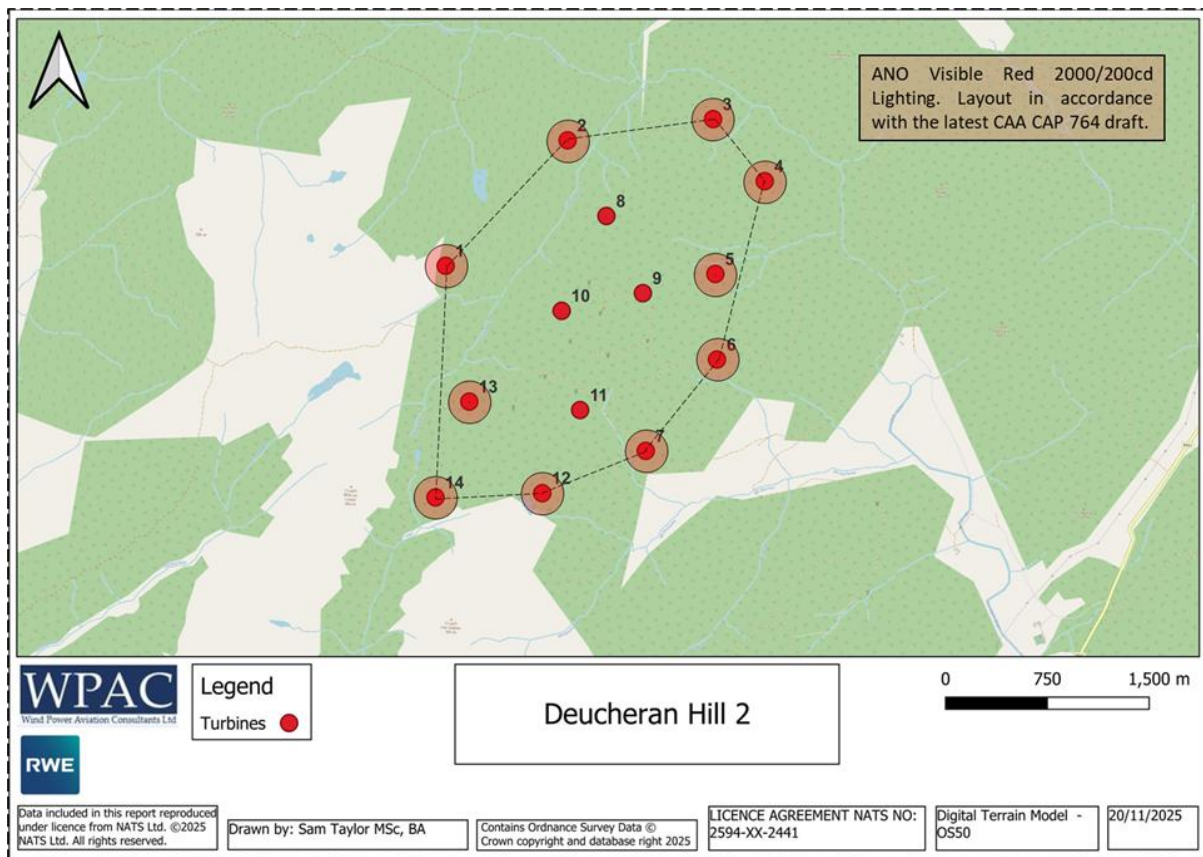


Figure 3 Lighting Layout without CAA Dispensations

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CAA-ANO Red 2000/200cd Reduced Lighting Proposal

7. The military have operated at low level at night for many decades now using night vision equipment. In more recent times, the last decade or so, more civilian operators have moved to night low level using suitable night vision equipment: night vision goggles (NVGs) etc. Such civilian operators include Coast Guard (CSAR), Police, Helicopter Emergency Medical Services (HEMS) and Air Ambulance.

8. Although, in the past, some night operators would fly at night at low level without night equipment (on carefully pre-planned exercises pre-flown by day) such events have been overtaken by the ever-widening use of night vision equipment. As a result, operators who now night fly, without night vision equipment, will fly at or above 'safety altitude' when not under the guidance of Air Traffic Control.

9. Aircraft operating at safety altitude or above and depending upon the protocol adopted or phase of flight, the safety altitude used will be 1000ft (300m), 1500ft (450m) or 2000ft (600m) above the local terrain/highest obstacle, this includes the turbine tip heights. Aircraft/helicopters flying as such, will only need enough visible lights to define the wind farm and its size/shape/perimeter.

10. Accordingly, aircraft flying above the Deucheran Hill 2 turbines, at safety altitude or above, and/or under ATC control, will only require an outline of the Deucheran Hill 2 site. Such a requirement could be met with **four** visible red lights on turbines **T1, T3, T6 and T14**

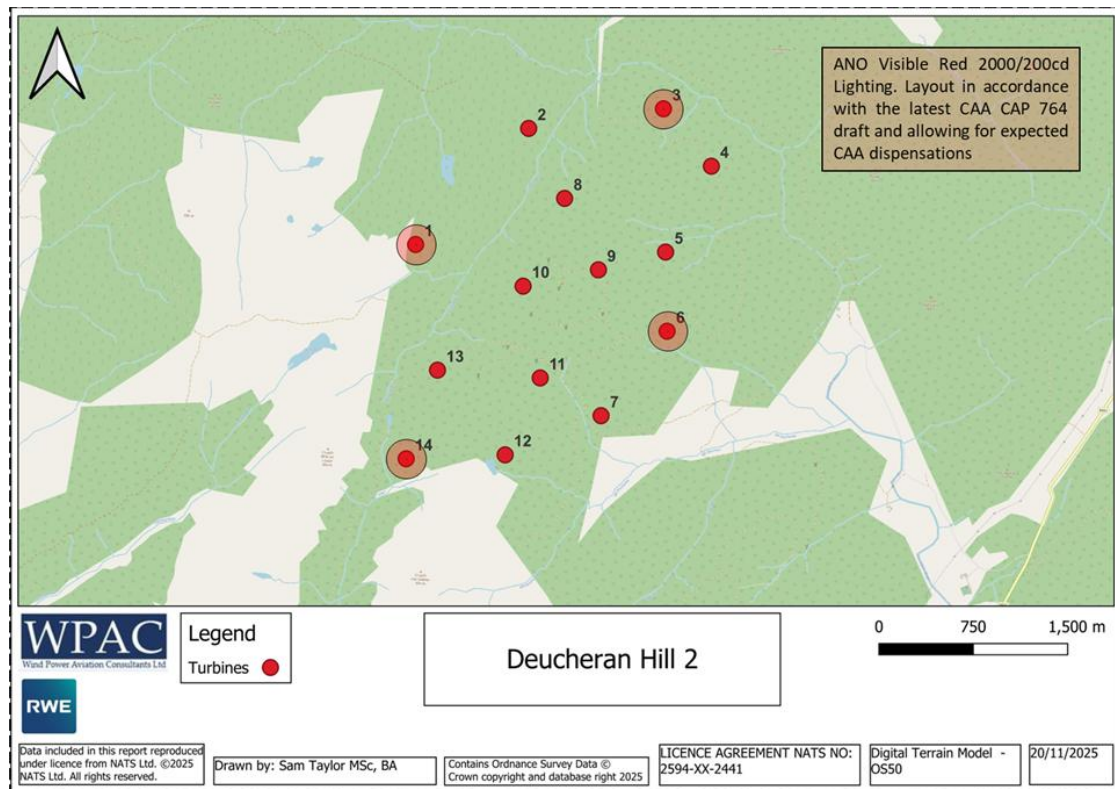


Figure 4 CAA-ANO Lighting Arrangement (including CAA dispensations).

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MOD Lighting Requirements

11. Early detection is important especially if the aircraft is manoeuvring hard and the air temperature profile causes the turbines to blend into the background. Suitable lighting is necessary for flight safety.

12. MOD IR lights have been developed to be invisible to the public at large but very detectable to aircrew night vision aids. As such the MOD IR lights can have a wide beam width and flash continuously without disturbing the visible environment.

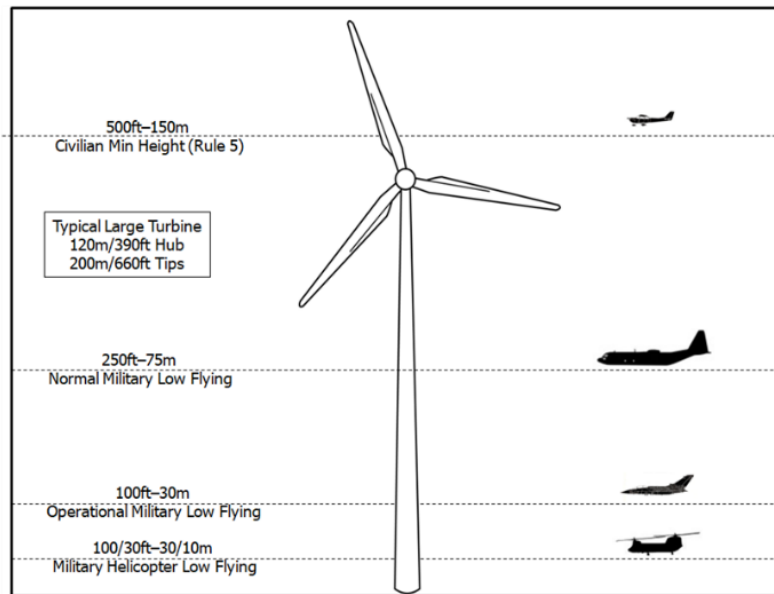


Figure 5 Wind turbine in context with MOD Low Flying

MOD Infra-Red Lighting Layout

13. The MOD requires:

- That all 'compound-perimeter' turbines (see blue dotted line in Figure 6) be lit unless removing a light will leave a gap of less than 500m between the remaining perimeter lit turbines. Note: At this site, the CAA string and MOD compound perimeters are notably different.
- That any dominant turbine, by location or height, be lit. Note: here, all turbines are lit.
- Deucheran Hill 2 does not meet the MOD small site criteria (red dotted circle in Figure 6). Accordingly, central (non-perimeter) turbines will require lighting
- Where the IR lighting concentration is high the MOD may approve a reduction in IR lights to help prevent NVG gain-down (undesirable for aircrew using NVGs). Although Deucheran Hill 2 potentially meets this criterion, current MOD policy does not seem to exercise this option. Accordingly, this dispensation is not expected.

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14. Applying these criteria dictates that all 14 turbines of the Deucheran Hill 2 site will require IR lighting. The Met Mast will also require an IR light.

Turbines with IR Lighting: T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13 and T14

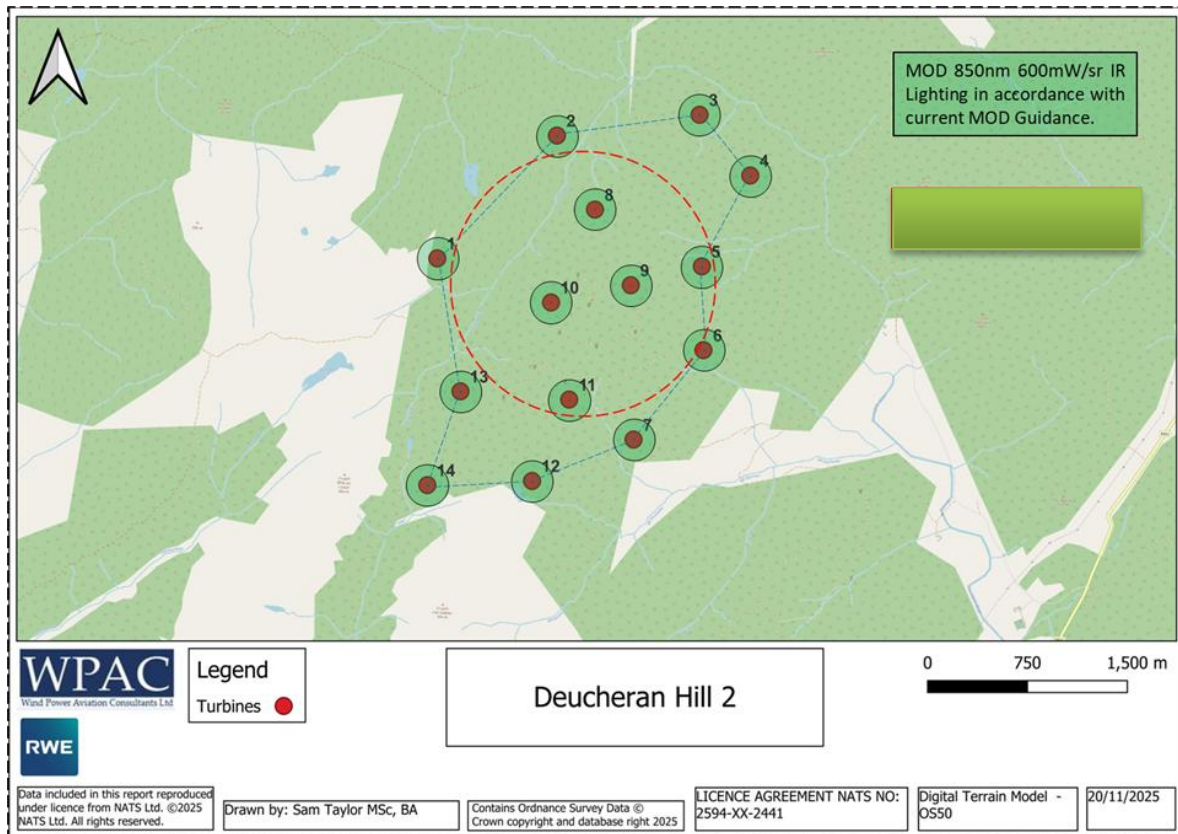


Figure 6 Proposed MOD Infra-Red Lighting Arrangement

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Combined CAA Visible Lighting and MOD Infra-Red Lighting

Deucheran Hill 2 Turbine Lighting Table						
Turbine	Easting	Northing	Hub Ht	Tip Agl	CAA-ANO	MOD IR
1	175008	644575	120	200	2000/200cd	600mW/sr
2	175907	645497	130	220		600mW/sr
3	176979	645653	130	220	2000/200cd	600mW/sr
4	177360	645197	120	200		600mW/sr
5	176996	644515	100	180		600mW/sr
6	177008	643886	100	180	2000/200cd	600mW/sr
7	176483	643215	100	180		600mW/sr
8	176193	644941	120	200		600mW/sr
9	176462	644374	100	180		600mW/sr
10	175863	644244	120	200		600mW/sr
11	175999	643515	100	180		600mW/sr
12	175720	642904	100	180		600mW/sr
13	175182	643577	130	220		600mW/sr
14	174933	642873	100	180	2000/200cd	600mW/sr
Met Mast	174767	644795	-	120		600mW/sr

Table 1 CAA and MOD Lighting Arrangement



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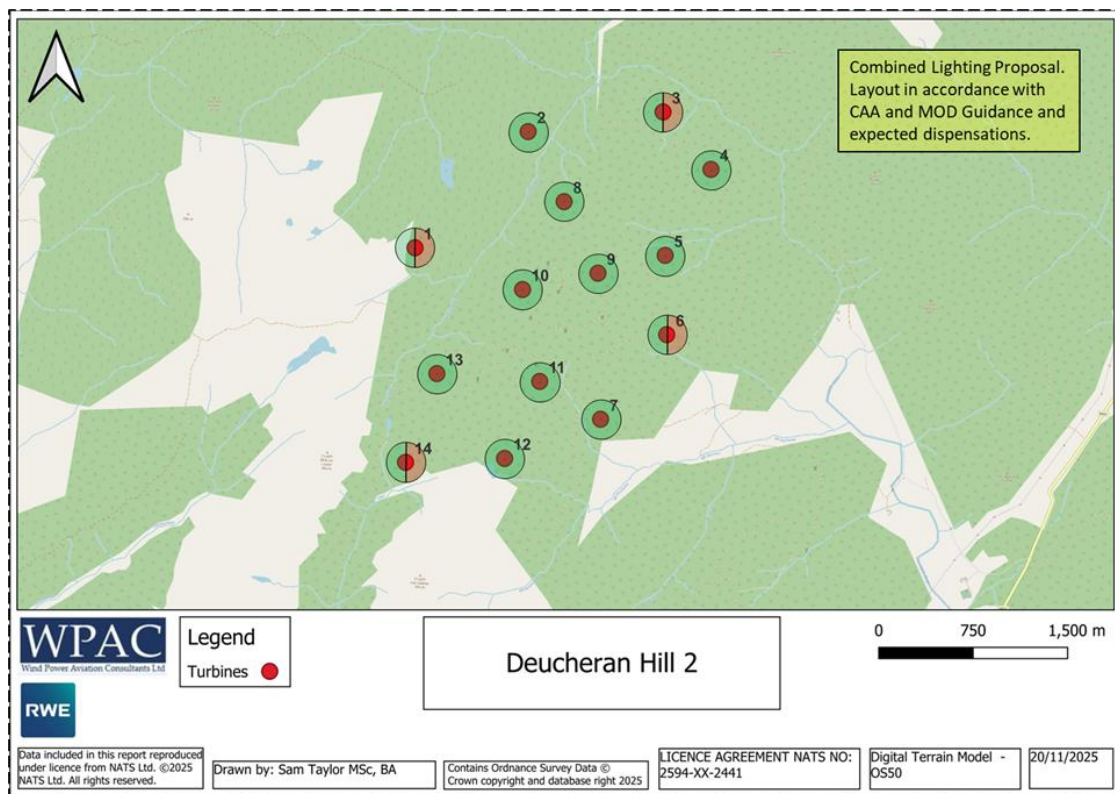


Figure 7 CAA-ANO Visible Red and MOD Infra-Red Lighting Arrangement

Lighting Specifications and Positioning

15. The CAA, in accordance with ICAO requirements, will require:
- A 2000cd red light on the turbine hub.
 - Three 32cd red lights half way up the turbine mast.
16. The MOD will require:
- An Infra-Red light on the turbine hub (it is possible to combine these with the ICAO Visible Red requirement into one light).

ANO Light Specifications

17. The ANO 2000/200cd Lights will conform to the ICAO specification as set out in Annex 14 Table 6-3. The lights will also be controlled such that when the met visibility is greater than 5km in all directions from all turbine hubs, the lights will be reduced to 200cd (10% of normal power). This reduction in power will not apply to MOD IR Lights.



ICAO Annex 14 Table 6-3 (excerpt)

Benchmark intensity	Minimum requirements					Recommendations				
	Vertical elevation angle (b)			Vertical beam spread (c)		Vertical elevation angle (b)			Vertical beam spread (c)	
	0°		-1°			0°	-1°	-10°		
	Minimum average intensity (a)	Minimum intensity (a)	Minimum intensity (a)	Minimum beam spread	Intensity (a)	Maximum intensity (a)	Maximum intensity (a)	Maximum intensity (a)	Maximum beam spread	Intensity (a)
2000	2000	1500	750	3°	750	2500	1125	75	N/A	N/A

a) 360° horizontal. All intensities are expressed in Candela. For flashing lights, the intensity is read into effective intensity, as determined in accordance with the Aerodrome Design Manual (Doc 9157), Part 4.

b) Elevation vertical angles are referenced to the horizontal when the light unit is levelled.

c) Beam spread is defined as the angle between the horizontal plane and the directions for which the intensity exceeds that mentioned in the "intensity" column.

Table 2 ICAO Annex 14 Table 6-3 Medium Intensity Lighting Specifications.

18. **Low Intensity Mid Mast Lights** – Mid mast lighting was originally intended to give an attitude/range reference (horizon indication) to pilots flying at night in the days before NVGs. Hub and mid mast lights will give a vertical reference (from which a horizontal reference can be gauged) when fitted to a single vertical structure. In contrast, a single light will not be able to give a vertical or horizontal reference or indication of range and range-rate. However, a series of single hub lights, on a group of structures, will provide a good horizon reference together with range and range-rate clues. Accordingly, the requirement for mid-mast lights is much diminished if not made redundant in the case of multiple vertical structures such as wind farms.

19. All of the current commercially available 32cd (supposedly focused) lights are over-engineered (up to 70cd between -30deg and +40deg to fit a multitude of aviation and marine applications) they induce a disproportionately large environmental impact, often significantly more than the focused hub 2000/200cd lights. WPAC proposed that the CAA guidance requirement for 32cd (Type B) mid mast lights be removed for Deucheran Hill 2. The CAA agreed that intermediate lighting is not required and this is reflected in their lighting reduction concession approval letter Appendix C to this report.

Table 6-2. Light distribution for low-intensity obstacle lights

	Minimum intensity (a)	Maximum intensity (a)	Vertical beam spread (f)	
			Minimum beam spread	Intensity
Type A	10 cd (b)	N/A	10°	5 cd
Type B	32 cd (b)	N/A	10°	16 cd
Type C	40 cd (b)	400 cd	12° (d)	20 cd
Type D	200 cd (c)	400 cd	N/A (e)	N/A

Note.— This table does not include recommended horizontal beam spreads. 6.2.1.3 requires 360° coverage around an obstacle. Therefore, the number of lights needed to meet this requirement will depend on the horizontal beam spreads of each light as well as the shape of the obstacle. Thus, with narrower beam spreads, more lights will be required.

Table 3 ICAO Annex 14 Table 6-2 Low Intensity Obstacle Lights.

IR Light Specifications

20. The IR lights will conform to the MOD specification as set out in MOD Lighting Guidance and shown below in Table 4.

MOD Specification IR.

IR wavelength – 750 to 900nm.

But ideally concentrated within 800 to 850nm for optimum detection by all military NVG types.

IR intensity – 600mW/sr minimum at peak flash but not above 1200mW/sr.

(Note: Typically a 300mW/sr steady burn LED IR light will generate 600mW/sr at peak flash)

This will generate a 7-8 nm NVG pick-up range - remaining above 5nm as the light ages.

Horizontal Pattern – unrestricted 360 deg.

Vertical Pattern – Minimum flash intensity of 600 mW/sr between +30 deg and -15 deg elevation.

– up to 50% reduction between +25 to +30 deg and -10 to -15 deg is acceptable.

– Maximum intensity of 1200 mW/sr for all angles of elevation.

– Vertical overspill is acceptable.

Flash Pattern – 60 flashes per min at 100-500 ms duration (ideally 250ms)

Synchronisation – all lights to be visually synchronised across a wind farm site

Table 4 MOD Specification for IR Obstacle Lights

Timings

21. The lights (IR and ANO) will be switched on between Evening Civil Twilight and Morning Civil Twilight in accordance with the UK Almanac; approximately 11 hours per day when averaged over the year.

Assessment of Aviation Lighting and Potential Mitigation Measures Designed into the Lights

22. Having defined a layout of turbines to be fitted with visible lighting, an assessment has been undertaken to calculate the brilliance of the lights when seen from a number of viewpoints. The standard aviation lights to be fitted to the nacelle of the turbines are required to fulfil certain design criteria in terms of brilliance and coverage as per Table 2. They are designated 'medium intensity obstruction lights' and have a **minimum** luminous intensity of 2000 candela¹ at horizontal and slightly above. The LED lights are also required to be able to shine a beam that reduces in intensity above and below the horizontal. One manufacturer of such obstruction lights, CEL, have tested their light, the CEL-WT-MIC² in a calibration chamber and produced results showing precisely how much the beam

¹ Candela is the SI Unit of luminous intensity and refers to the amount of light emitted in a particular direction.

² [CEL-WT-MIC - rev1.pdf](#)

reduces in brilliance at any specified elevation angle. The results are interpolated to every 0.1° . This light is a finely tuned upgrade to the previous version and has been developed specifically for onshore wind turbine lighting in order to minimise downward light intensity and is now available from the manufacturer.

23. Figure 8 demonstrates the reduction in luminous intensity below the horizontal and also above 1° in elevation. The various coloured lines are the candela measured from different angles in the horizontal in order to measure the performance all around the light.

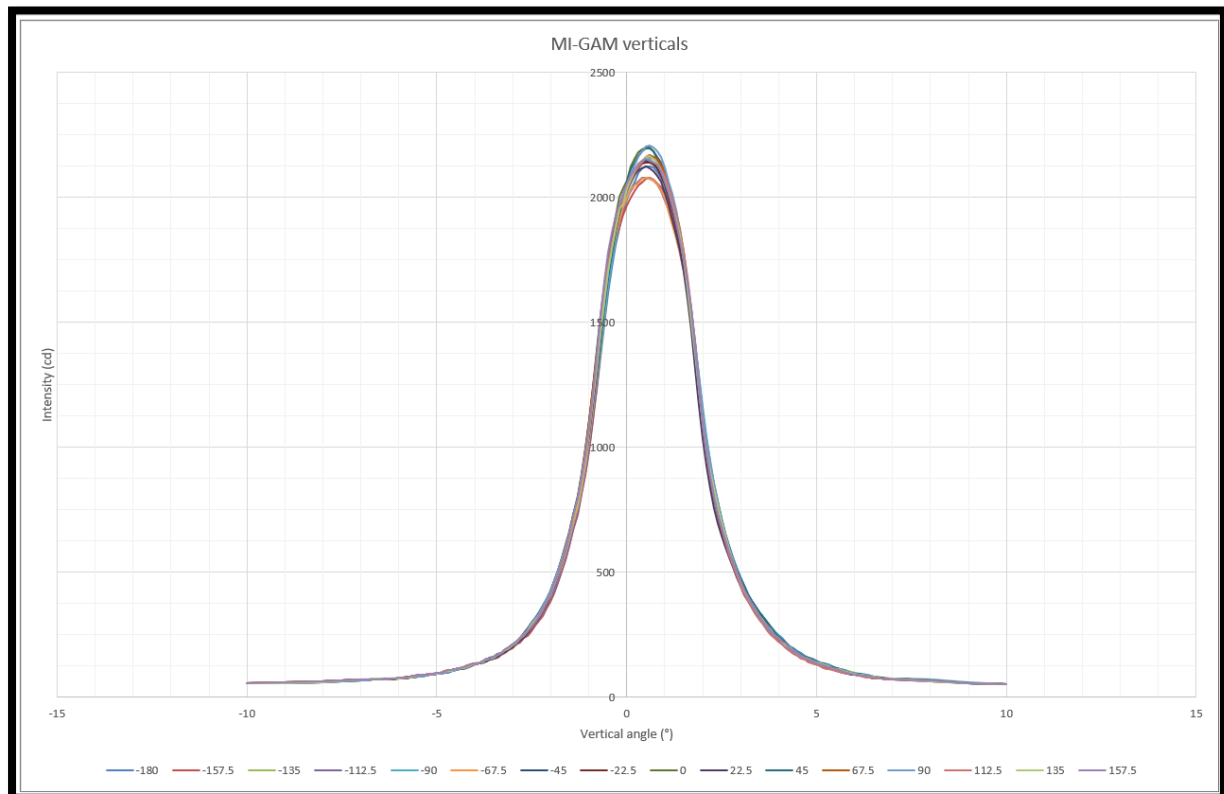


Figure 8 (MI GAM CEL-WT-MIC Light Measurement Results)

24. WPAC have utilised their propagation modelling system (Rview) to calculate the precise angle of elevation between the turbine light and a viewpoint assuming a height of eye of 1.5 metres and turbine hub heights of 100, 120 and 130 metres as required. The system utilises a standard atmospheric model and an earth model that uses actual earth curvature between the turbine light and the viewpoint. Ordnance Survey OS50 DTM is used as the terrain model. The calculations have been undertaken for each designated lit turbine against all designated Deucheran Hill 2 viewpoints. The locations of the viewpoints are shown in Figure 9 and Table 5.

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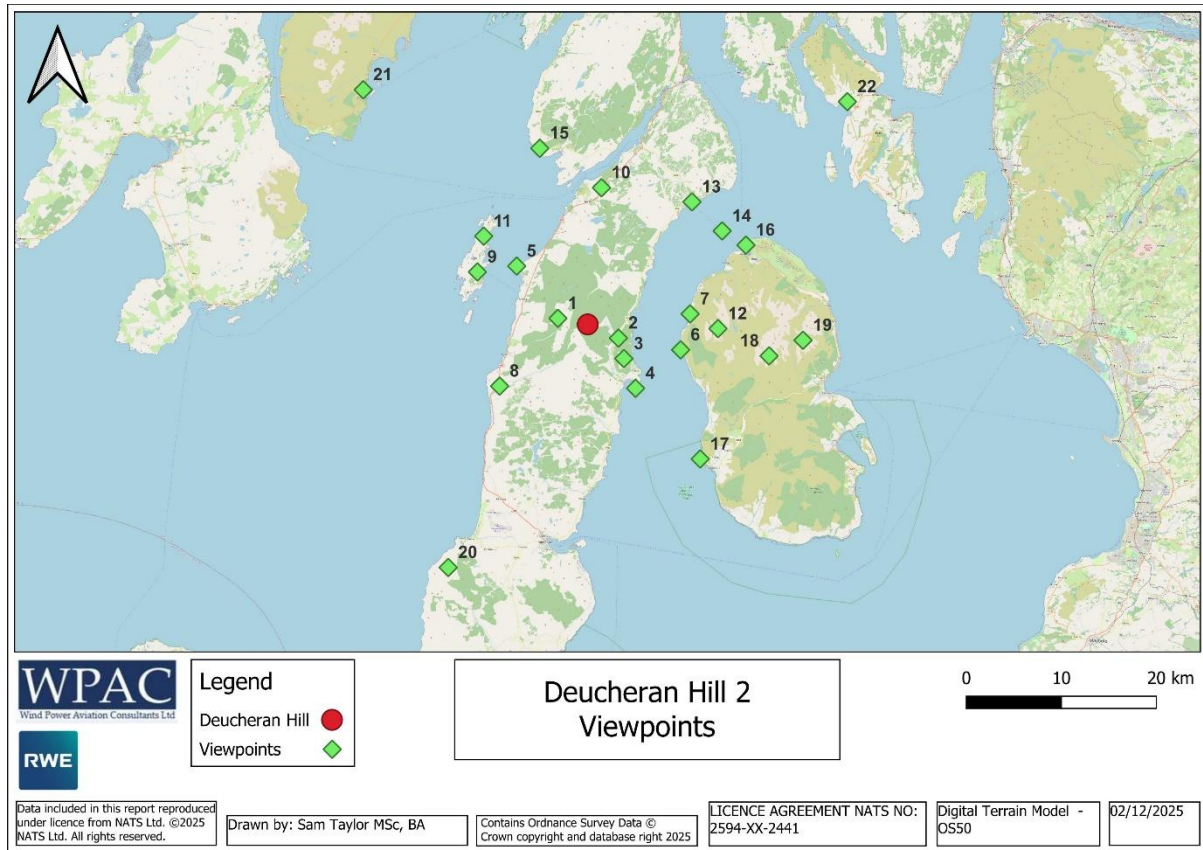


Figure 9 Viewpoint Locations

25. The next stage in the process is to take the candela figures radiated towards a viewpoint and taking into account the distance, calculate the lumens per square metre (also known as Lux) that will be experienced by the human eye at the viewpoint. The figure produced is in micro-lumens per square metre or $\text{lumen}^{(10-6)}/\text{m}^2$ or $\text{lux}^{(10-6)}$. These are perfect clear-air figures and therefore worst-case results from an LVIA perspective. Figures obtained by this method enable comparisons to be made with commonly understood light sources such as stars or planets. In practice the light intensity at the observation points will be further attenuated by scatter and absorption by airborne dust, droplets and aerosols in the atmosphere. This attenuation is typically in the order of 10 to 20% but can be as high as 75% at the more distant observation ranges.

26. The results for every lit turbine from all of the viewpoints are shown in the results tables in Appendix A to this report. Viewpoints where lights are obstructed by terrain are shaded in green, when the viewpoint is too close to a turbine to get an accurate assessment, it is shaded red. **To take into account any limitations within the terrain model we have highlighted in purple any viewpoints where the line of sight is under 10 metres above ground level but above 1.5 metres and should therefore, still be screened by terrain but may be visible within the vicinity of the viewpoint.**

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Viewpoint Number	Viewpoint Name	Position
1	Kintyre Way	NR 73348 43850
2	B842, Kintyre Way	NR 79715 41777
3	Deer Hill (Cnoc nan Gabhar)	NR 80287 39627
4	Carradale Point (fort)	NR 81516 36504
5	Kintyre Way at Rhunahaorine Point	NR 69010 49344
6	Imachar Point	NR 86265 40545
7	Pirnmill, Arran Coastal Way	NR 87256 44317
8	A83 at Glenbarr	NR 67215 36732
9	Ardminish, Gigha	NR 64876 48726
10	A83 north of Clachan	NR 77930 57570
11	East Tarbert Bay, Gigha	NR 65539 52486
12	Mullach Buidhe, North Arran NSA	NR 90193 42775
13	Claonaig ferry terminal	NR 87454 56082
14	Lochranza Ferry	NR 90630 53032
15	B8024 south of Kilberry	NR 71434 61712
16	Newton Point, North Arran NSA	NR 93134 51543
17	Drumadoon Point, North Arran NSA	NR 88318 29079
18	Beinn Nuis	NR 95568 39906
19	Goatfell, North Arran NSA	NR 99137 41551
20	Kintyre Way south of Machrihanish	NR 61803 17683
21	A846, Jura (wireline only)	NR 52862 67855
22	B875, Bute (wireline only)	NS 03805 66612

Table 5 Viewpoints

Interpreting the Results

27. The results show that there is a significant decrease in the luminous intensity (candela) of the light emanating towards those viewpoints which are at lower angles of elevation in relation to the turbine hub. However, when considering the perception of the light from a viewpoint in general, the distance between the light and the viewpoint is likely to be the dominant factor and the resultant figure in micro-lux is the most relevant figure to consider. This report provides the results and anticipates that the Landscape and Visual Impact Assessment (LVIA) consultants will be able to put them into the correct context for visualisations in terms of background environmental lighting and atmospheric conditions. Table 6 shows the turbine with the greatest potential perceived luminous intensity expressed in micro-lumens per m² (Lux ⁽¹⁰⁻⁶⁾) at each viewpoint.



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Viewpoint	Turbine	Distance (KM)	Microlumens per m2 (lux10 ⁻⁶)	Microlumens at 10%	Obscured
1	14	1.86	101.0	10.1	
2	3	4.74	10.9	1.1	
3	3	6.87	35.9	3.6	
4	3	10.21	16.3	1.6	X
5	3	8.78	22.0	2.2	X
6	3	10.6	5.7	0.6	
7	3	10.36	5.4	0.5	
8	6	12.13	12.7	1.3	X
9	1	10.95	3.2	0.3	
10	3	11.96	9.2	0.9	
11	1	12.34	2.9	0.3	
12	6	13.23	10.0	1.0	
13	6	16.06	3.0	0.3	
14	3	15.52	3.9	0.4	
15	1	17.51	2.8	0.3	
16	3	17.2	3.6	0.4	
17	3	20.08	2.9	0.3	
18	6	18.98	5.4	0.5	X
19	3	22.53	3.6	0.4	
20	1	29.96	1.9	0.2	
21	1	32.13	1.3	0.1	
22	3	34.04	1.4	0.1	

Table 6 Brightest Turbine Hub Light from each Viewpoint (measured in micro-lumens)

28. In order to place the values in microlumens per m² (lux^{10⁻⁶}) in context, Table 7 provides some examples of approximate values placed on a number of environmental comparators, however these are just an illustration to place the results in a real world environment. The actual perceived brightness will depend upon a number of factors including bulb manufacturer, bulb type, specific construction (single/multiple colour LEDs etc) atmospheric conditions, absorption spectrum, individual eye characteristics and capabilities.



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Comparison Object	Approximate Illuminance (micro-lumens per m ²)
Car Halogen main beam approaching 1km	Up to 1,000,000 (can vary significantly between cars)
International Space Station (400km up)	1000 (depends upon relative position of sun)
Car Brake Light at 0.5km	400
Car Brake Light at 0.7km	200
Car Brake Light at 1.0km	100
Car Brake Light at 2.0km	25
Car Brake Light at 5.0km	4
Car Brake Light at 10km	1
Front Cycle Light at 0.5km	140 (Modern high power white LED)
Front Cycle Light at 0.7km	70
Front Cycle Light at 1.0km	35
Front Cycle Light at 2km	9
Front Cycle Light at 5km	2
White LED Street Light at 0.5km	500 (Viewed from the horizontal)
White LED Street Light at 0.7km	250
White LED Street Light at 1.0km	120
White LED Street Light at 2.0km	30
White LED Street Light at 5.0km	8
Sodium Street Light at 0.5km	300 (Viewed from the horizontal)
Sodium Street Light at 0.7km	150
Sodium Street Light at 1.0km	75
Sodium Street Light at 2.0km	20
Sodium Street Light at 5.0km	5
Brightest Star in the Sky (Sirius)	13
Airliner flying at 30,000ft)	Nav Lights 0.4 to 5; anti-collision lights 2 to 20
Typical bright star (e.g. Orion)	0.5 to 2.0
Faintest light visible from street lit area	0.4
Visible limit for fully dark-adapted eyes	0.02

Table 7 Comparisons of approximate micro-lumens values



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29. If there is a requirement to consider the brightest turbine in terms of emitted candela rather than micro-lumens, Table 8 provides data on which turbine emits the most candela towards each viewpoint but takes no account of the distance between light and viewpoint.

Viewpoint	Turbine	Distance (KM)	Candela	Candela at 10%	Obscured
1	14	1.86	350	35	
2	3	4.74	245	24	
3	3	6.87	1697	170	
4	3	10.21	1697	170	X
5	3	8.78	1697	170	X
6	3	10.6	642	64	
7	3	10.36	584	58	
8	3	13.23	2134	213	X
9	1	10.95	378	38	
10	3	11.96	1314	131	
11	1	12.34	448	45	
12	1	15.29	2006	201	
13	6	16.06	776	78	
14	3	15.52	949	95	
15	14	19.16	949	95	
16	3	17.2	1055	106	
17	3	20.08	1181	118	
18	1	21.08	2092	209	X
19	14	24.24	2054	205	
20	1	29.96	1697	170	
21	6	34.02	1451	145	
22	3	34.04	1580	158	

Table 8 Brightest Turbine Hub Light measured in Candela emitted towards a viewpoint



Part 2 Mitigation

Intensity Reduction (ANO Lighting: 2000cd down to 200cd)

30. The lights (IR and visible red lights) will be switched on between Evening Civil Twilight and Morning Civil Twilight in accordance with the UK Almanac; approximately 11 hours per day averaged over the year.

31. The primary mitigation consideration in addition to the already described reduction in brilliance due to elevation angle, is taken from Reference D which states:

'If the horizontal meteorological visibility in all directions from every wind turbine generator in a group is more than 5 km, the intensity for the light positioned as close as practicable to the top of the fixed structure required to be fitted to any generator in the windfarm and displayed may be reduced to not less than 10% of the minimum peak intensity specified for a light of this type'.

32. It is therefore possible to take advantage of the CAA SARG Policy Statement dated 01/06/2017 and incorporate the option to reduce the hub height lighting to not less than 10% of the minimum peak intensity specified for the installation in good weather. In essence, reducing the 2000cd obstruction lights to 200cd in meteorological visibilities greater than 5km. Note: This concession is not applicable to MOD specification IR lighting, which is covered separately.

33. It will be necessary to calculate how much time the lights would spend at 2000cd and at 200cd. To assess historical visibility in this Highlands region, the closest meteorological station to Deucheran Hill 2 is at Prestwick Airport. Note: there are no meteorological stations that publish meaningful historical data closer to Deucheran Hill 2. However, although the visibility at these airports will not be identical to Deucheran Hill 2 they will invariably be in the same air-mass for the majority of the time and will give similar observations over the longer period.

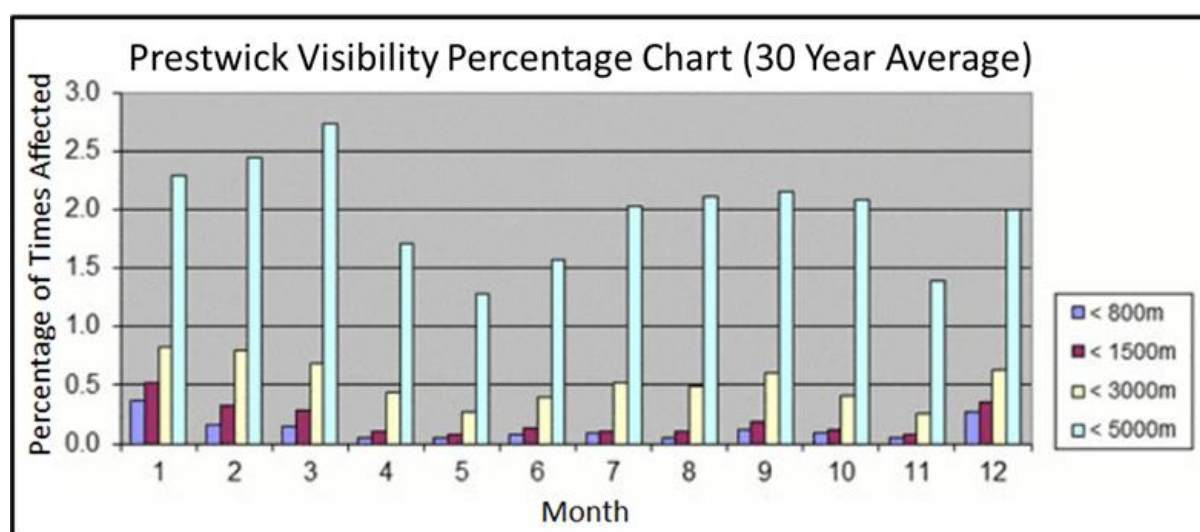


Table 9 Prestwick Visibility

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34. The Met Office table shows that the visibility is below 5km (light blue bar) for an average of 2% of the time at Prestwick. This suggests that the Deucheran Hill 2 turbine lights will be at **2000cd for 2% of the time and 200cd for 98% of the time.**

35. In addition, visibility improves with height since the concentration of particles (dust, haze) and liquid droplets (water) reduces with height and the air also becomes thinner. It could be argued that the Deucheran Hill 2 site visibility would be better than that at Prestwick.

Obstruction Light Weather Obscuration.

36. On occasion, the visibility in the area of Deucheran Hill 2 will reduce significantly due to the presence of cloud on the hills. If the Deucheran Hill 2 turbines are in cloud, then the obstruction lights will not be seen. The turbines will carry the CAA/ANO lights on the turbine hub. The average height at the base of these turbines is around 700-1000ft above mean sea level (amsl). The hub heights, for the proposed turbines will be around 400ft above ground level (agl) giving hub heights averaging around 1100-1400ft amsl. For aeronautical reasons, meteorological cloud bases are quoted in feet (ft).

37. It is now possible to compare the average **turbine hub/light** height of **1100-1400ft amsl** with the actual cloud bases recorded by the Met Office at Prestwick Airport, again, over a 30-year period as shown in Table 10.

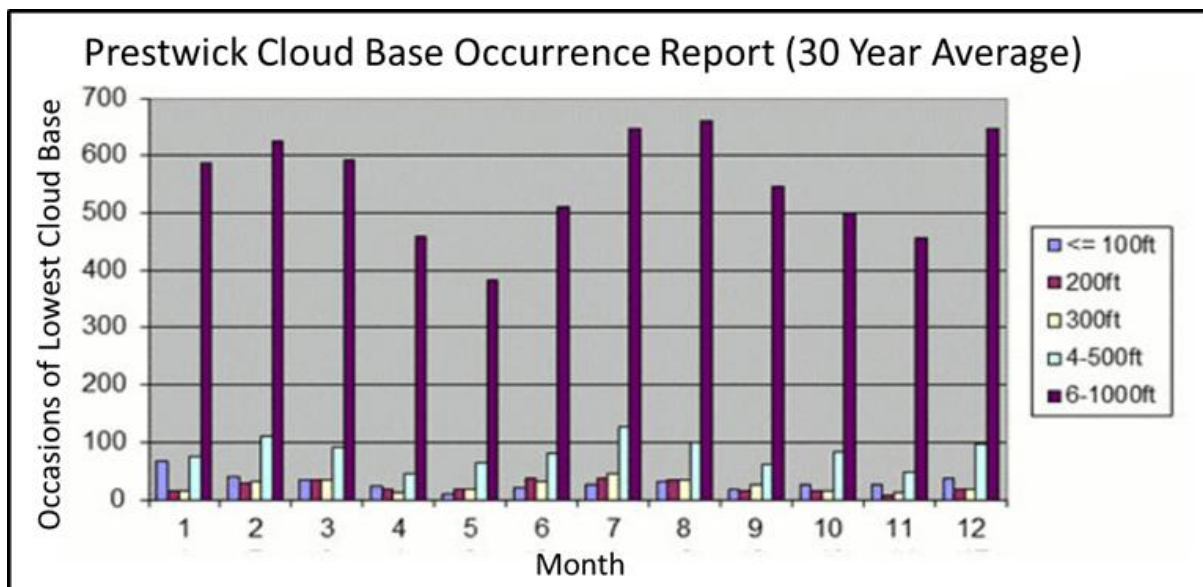


Table 10 Prestwick Cloud Base

38. The burgundy columns (600-1000ft) indicate that **the cloud base will range from approximately 100ft to 900ft below the lights on around 550 occasions a month.** At this distance below the turbine hubs the lights will be completely obscured to the general public. The other columns (light blue in particular 400-500ft) indicate that on a further 150 or more occasions a month the lights will be completely obscured by cloud. Note: Met Office statistics report cloud base in occurrences as opposed to total duration.



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39. Again, whilst Prestwick Airport is not Deucheran Hill 2, the two locations will invariably sit in the same air mass offering the same cloud/visibility characteristics. Met Office statistics show that cloud-bases in the general area of Deucheran Hill 2 will obstruct the ANO visible lights on many hundreds of times over a month; potentially up to 700 times. Moreover, Met Office statistics further show that cloud bases reduce in the region of hills. It could be argued that at Deucheran Hill 2 the cloud-base would on the whole, be lower than at Prestwick thus providing an even greater degree of light obscuration on more occasions per month than predicted by the weather data presented here.

Weather Obscuration Conclusion

40. It is most important not to try and combine the two different observations, visibility and cloud-base, into a single statement. Informal advice direct from Met Office and Airport forecasters indicates that the information for Deucheran Hill 2, so gathered, should be presented as follows:

Meteorological observations suggest that the turbine hubs will be obscured on several hundred occasions a month by cloud. (Obstruction lights not visible to the public)

When not obscured by cloud, the visibility in the area of the turbines can be expected to exceed 5km for up to 98% of the time. (Obstruction lights switched down to 200cd)

Conclusion/Notes

41. The purpose of this report is to identify an obstruction lighting arrangement that will have the minimum effect upon the environment but at the same time is a safe design for night low level operators. This has been accomplished by using a combination of CAA ANO and MOD IR lights.

42. Applying the CAP 764 criteria for visible red obstruction lighting resulted in a lighting solution that requires ten turbines to carry a visible red ANO light. By applying current CAA dispensations and then matching the lighting to the operators that will require night visible lighting, minimal but aviation safe layout was achieved. This results in a total of:

4 x ANO Red 2000/200cd lights and 14 x MOD IR 600mW/sr lights and an additional IR light on the Met Mast.

43. Furthermore, the site is in an area where it will benefit from 90% light-dimming in good-weather and obscuration of both turbines and the visible ANO lighting in poor weather. This lighting layout was sent to the CAA for approval, and they have responded with their dispensation approval letter attached at Appendix C confirming the proposed lighting layout.

The lights will be regularly obscured by cloud and when not obscured set at the lower 200cd for approximately 98% of the time.

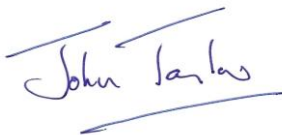
44. The CAA currently state: *met visibility should be measured at suitable points around the wind farm.* In the case of the Deucheran Hill 2 turbines: Visibility Meters on **T1, T3, T6 and T14** will meet this criterion.



Authors

Cdr John Taylor RN (Ret) – after a career in the Royal Navy specialising in Air Traffic Control (ATC), Airspace Management and Air Defence which culminated in leading both the ATC and Fighter Control Specialisations, John worked for Lockheed Martin UK for three years as a Principal Consultant and Business Area Manager responsible for Air Traffic Management Consultancy, including the provision of advice to wind farm developers. In 2008 he founded WPAC Ltd and since then he and his team have provided aviation advice in relation to over 2000 wind farm and wind turbine sites, given evidence at a number of planning inquiries and enabled many sites to overcome aviation objections where it was feasible to do so. He and his team have also provided advice to a number of Local Planning Authorities, Renewable UK and the Aviation Fund Management Board, including organising workshops and the provision of guidance documents. John also advises planners and developers in relation to physical and technical safeguarding of non-wind farm developments in the vicinity of aviation facilities.

Sqn Ldr Mike Hale RAF (Retd) has over 45 years, piloting, instructing and examining experience on numerous military fast jet aircraft through to a range of civilian and military general aviation training aircraft and gliders. He has held many posts including Flying Instructor, Training Officer, Flight Commander, Squadron Commander and Principal Tornado AD Force Examiner. He has amassed over 10,000 flying hours of experience when operating at many locations around the world. In parallel to his flying duties, Mike held the post of Officer Commanding the MOD Low Flying Operations Squadron (OC LFOS). In this post he was both Low Level Airspace Manager for the MOD & Wind-Farm Subject Matter Expert for the Defence Infrastructure Organization (DIO). During that period, he assessed over 14,000 wind-farm pre-applications and 2000 full applications against low flying, weapons range, specialist airspace, local community and aerodrome safeguarding criteria. Mike also instigated two Qinetiq ground based Infra Red obstruction lighting trials. These were followed by instigating and managing the MOD Infra Red/Low Intensity (Henlow) flight trials and the CAA/MOD/Trinity-House/RUK off-shore IR/Morse (North Hoyle) flight trials. In conjunction, Mike organised numerous and various supporting trials including night vision equipment compatibility and detailed lighting beam overspill analysis (where light is emitted outside the required specification envelope). In 2012, he was awarded an MBE for generating a proactive and mutually successful working relationship between the Wind Power Industry and the MOD Air Staff.



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Appendix A Lighting Results Tables

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	1.81	-3.0	206	21	62.8	6.3	
3	4.05	0.8	2117	212	128.8	12.9X	
6	3.66	-0.5	1697	170	126.7	12.7M	
14	1.86	-2.2	350	35	101.0	10.1	

Viewpoint 1 Kintyre Way

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	5.48	-3.6	154	15	5.1	0.5M	
3	4.74	-2.7	245	24	10.9	1.1	
6	3.43	-4.8	104	10	8.8	0.9	
14	4.91	-3.6	154	15	6.4	0.6X	

Viewpoint 2 B842, Kintyre Way

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	7.24	-1.5	706	71	13.5	1.4M	
3	6.87	-0.5	1697	170	35.9	3.6	
6	5.38	-1.3	776	78	26.9	2.7M	
14	6.26	-1.5	642	64	16.4	1.6M	

Viewpoint 3 Deer Hill (Cnoc nan Gabhar)

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	10.37	-2.0	409	41	3.8	0.4X	
3	10.21	-0.5	1697	170	16.3	1.6X	
6	8.65	-1.5	642	64	8.6	0.9X	
14	9.16	-1.9	448	45	5.3	0.5X	

Viewpoint 4 Carradale Point (fort)



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Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	7.66	-2.7	245	24	4.2	0.4X	
3	8.78	-0.5	1697	170	22.0	2.2X	
6	9.68	-0.8	1314	131	14.0	1.4X	
14	8.77	-1.1	949	95	12.3	1.2X	

Viewpoint 5 Kintyre Way at Rhunahaorine Point

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	11.96	-2.0	409	41	2.9	0.3	
3	10.6	-1.5	642	64	5.7	0.6	
6	9.84	-2.0	409	41	4.2	0.4	
14	11.57	-1.9	448	45	3.3	0.3	

Viewpoint 6 Imachar Point

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	12.25	-1.9	448	45	3.0	0.3	
3	10.36	-1.6	584	58	5.4	0.5	
6	10.26	-1.9	448	45	4.3	0.4	
14	12.41	-1.8	488	49	3.2	0.3	

Viewpoint 7 Pirnmill, Arran Coastal Way

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	11.06	-1.6	584	58	4.8	0.5X	
3	13.23	0.7	2134	213	12.2	1.2X	
6	12.13	-0.3	1867	187	12.7	1.3X	
14	9.86	-1.3	776	78	8.0	0.8X	

Viewpoint 8 A83 at Glenbarr



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Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	10.95	-2.1	378	38	3.2	0.3	
3	12.49	-0.9	1181	118	7.6	0.8X	
6	13.06	-0.8	1314	131	7.7	0.8X	
14	11.64	-1.8	488	49	3.6	0.4X	

Viewpoint 9 Ardminish, Gigha

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	13.32	-1.3	776	78	4.4	0.4	
3	11.96	-0.8	1314	131	9.2	0.9	
6	13.72	-1.0	1055	106	5.6	0.6	
14	15	-1.1	949	95	4.2	0.4M	

Viewpoint 10 A83 north of Clachan

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	12.34	-1.9	448	45	2.9	0.3	
3	13.32	0.0	2028	203	11.4	1.1X	
6	14.34	-0.9	1181	118	5.8	0.6X	
14	13.44	-1.2	858	86	4.8	0.5X	

Viewpoint 11 East Tarbert Bay, Gigha

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	15.29	1.1	2006	201	8.6	0.9	
3	13.52	1.8	1390	139	7.6	0.8	
6	13.23	1.6	1743	174	10.0	1.0	
14	15.26	1.2	1955	195	8.4	0.8	

Viewpoint 12 Mullach Buidhe, North Arran NSA



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Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	16.95	-1.4	776	78	2.7	0.3X	
3	14.78	-0.6	1580	158	7.2	0.7X	
6	16.06	-1.3	776	78	3.0	0.3	
14	18.2	-1.1	949	95	2.9	0.3X	

Viewpoint 13 Claonaig ferry terminal

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	17.76	-1.4	706	71	2.2	0.2	
3	15.52	-1.1	949	95	3.9	0.4	
6	16.41	-1.3	776	78	2.9	0.3	
14	18.7	-1.2	858	86	2.5	0.3	

Viewpoint 14 Lochranza Ferry

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	17.51	-1.2	858	86	2.8	0.3	
3	16.99	-0.5	1697	170	5.9	0.6X	
6	18.68	-0.9	1181	118	3.4	0.3X	
14	19.16	-1.1	949	95	2.6	0.3	

Viewpoint 15 B8024 south of Kilberry

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	19.42	-1.3	776	78	2.1	0.2	
3	17.2	-1.0	1055	106	3.6	0.4	
6	17.85	-1.2	858	86	2.7	0.3	
14	20.16	-1.2	949	95	2.3	0.2	

Viewpoint 16 Newton Point, North Arran NSA



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Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	20.43	-1.2	858	86	2.1	0.2	
3	20.08	-0.9	1181	118	2.9	0.3	
6	18.63	-1.1	949	95	2.7	0.3	
14	19.22	-1.2	858	86	2.3	0.2	

Viewpoint 17 Drumadoon Point, North Arran NSA

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	21.08	0.9	2092	209	4.7	0.5X	
3	19.46	1.4	1827	183	4.8	0.5X	
6	18.98	1.2	1955	195	5.4	0.5X	
14	20.85	1.0	2054	205	4.7	0.5X	

Viewpoint 18 Beinn Nuis

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	24.32	1.1	2006	201	3.4	0.3X	
3	22.53	1.4	1827	183	3.6	0.4	
6	22.25	1.4	1827	183	3.7	0.4X	
14	24.24	1.1	2054	205	3.5	0.4	

Viewpoint 19 Goatfell, North Arran NSA

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	29.96	-0.5	1697	170	1.9	0.2	
3	31.82	1.6	1643	164	1.6	0.2X	
6	30.3	-0.1	1984	198	2.2	0.2X	
14	28.41	-0.4	1790	179	2.2	0.2X	

Viewpoint 20 Kintyre Way south of Machrihanish



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Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	32.13	-0.8	1314	131	1.3	0.1	
3	32.78	0.1	2064	206	1.9	0.2X	
6	34.02	-0.7	1451	145	1.3	0.1	
14	33.34	-0.8	1314	131	1.2	0.1	

Viewpoint 21 A846, Jura

Turbine	Distance (KM)	Elevation Angle	Candela	Candela at 10%	Microlumens per square metre (lux10-6)	Microlumens per square metre (lux ¹⁰⁻⁶) at 10%	Obscured
1	36.26	-0.7	1451	145	1.1	0.1	
3	34.04	-0.6	1580	158	1.4	0.1	
6	35.14	-0.7	1451	145	1.2	0.1	
14	37.38	-0.7	1451	145	1.0	0.1	

Viewpoint 22 B875, Bute



Appendix B – Abbreviations and Definitions

ADSB.....	Automatic Dependent Surveillance Broadcast
ADLS	Automatic Detection Lighting System
AGL.....	Above Ground Level (Height)
ANO.....	Air Navigation Order
AMSL.....	Above Mean Sea Level (Elevation)
ASG.....	Aviation Steering Group
CAA.....	Civil Aviation Authority
CAP.....	Civil Aviation Publication (Referrers to Specific Documents)
cd.....	Candela, a measure of light intensity
DIO.....	Defence Infrastructure Organisation
HNTA.....	Helicopter Night Training Area
In Flight Visibility.....	The distance a pilot can see ahead to fly & navigate the aircraft
IR.....	Infra-Red
Kts.....	Knots: a measure of airspeed (10 kts = 12mph = 19 kph)
LED.....	Light Emitting Diode
MOD.....	Ministry of Defence
mW/sr.....	milliWatts per steradian: electromagnetic energy output related to solid angle
Nm.....	Nautical Mile
NVD	Night Vision Devices - Aircraft Mounted
NVG.....	Night Vision Goggles - Operator Worn
Radar Altimeter.....	An altimeter that uses radar to accurately measure height above ground
QFE	Setting on Altimeter that gives Height above Airfield
RoAR.....	Rules of the Air Regulations
Rule 5.....	The Low Flying Rule – part of RoAR
Rule 28.....	VFR Rules Outside Controlled Airspace – part of the RoAR
ReUK.....	Renewables UK – The UK Wind Industry Body
SAR Box.....	Night Training Area for Search and Rescue Helicopter Units
SSA.....	Sector Safety Altitude
SSR.....	Secondary Surveillance Radar
TMZ.....	Transponder Mandatory Zone
UKAB.....	United Kingdom Air Prox Board – Investigates Aircraft Near Misses
VFR.....	Visual Flight Rules (Flight without ATC on a see-and-be-seen basis)
VMC.....	Visual Meteorological Conditions (Weather suitable for VFR flight)

Appendix C CAA Response

**Communications, Strategy and Policy Group
Windfarm Policy**



Mike Hale
Aviation Consultant
Wind Power Aviation Consultants Ltd.
38 Hadrian Way
Chilworth
Southampton
SO16 7HX

10 March 2026
Ref Windfarms / Deucheran Hill 2

Dear Mike,

Proposed Obstacle Lighting Scheme for Deucheran Hill 2 Wind Farm

Reference: Deucheran Hill 2 Wind Farm aviation obstacle lighting proposal dated 21 November 2025

1. Thank you for the lighting proposal at reference. The document discusses the proposed obstacle lighting plan for the Deucheran Hill 2 Wind Farm, located approximately 27km north of Campbeltown Airport and 24km west of Prestwick Airport.
2. The proposed Deucheran Hill 2 Wind Farm consists of 14 turbines, with tip heights between 180 m and 220m above ground level, which brings them within scope of the Air Navigation Order (ANO) Article 222 obstacle lighting requirements.
3. We have considered the report carefully and take note of the intent to address concerns relating to adverse visual impacts of aviation lighting on non-aviation receptors while ensuring that the lighting installed on the turbines meets air safety requirements.
4. We note the proposed lighting scheme has some mitigation proposed with the provision of infra-red lighting for those operators who carry Night Vision Device capability.
5. Under provisions given in the Air Navigation Order (ANO) Article 222 section 6, the CAA provides for the following variation:
 - medium intensity steady red (2000 candela) lights on the nacelles of turbines T01, T03, T06 and T14;
 - a second 2000 candela light on the nacelles of the above turbines to act as alternates in the event of a failure of the main light (note that both lights should not be lit at the same time);

- the lights on these turbines to be capable of being dimmed to 10% of peak intensity when the lowest visibility as measured at suitable points around the wind farm by visibility measuring devices exceeds 5 km;
- infra-red lights to MoD specification installed on the nacelles of turbines T01, T02, T03, T04, T05, T06, T07, T08, T09, T10, T11, T12, T13 and T14 (note that dimming permission is applicable only to visible lights, not infra-red lighting).

6. Intermediate level 32 candela lights are not required to be fitted on the turbine towers.
7. If the proposed design of the wind farm changes (other than variations due to micro-siting etc.) this is likely to require a revision to this aviation obstacle lighting variation.
8. Please let me know if you have any further queries.

Yours sincerely,



Andy Wells
Manager Aviation and Wind Turbine Policy

Appendix D CEL-WT-MIC Specification



Medium Intensity Red 2,000cd Light

230VAC - LED Aircraft Warning Light

CEL-WT-MIC - StandAlone / Modbus

Medium intensity stand-alone 2,000cd red model is designed for Wind Turbine Installations. This intelligent light offers unique features such as incorporated fault monitoring, photocell, GPS synchronisation, adjustable luminosity and supports both stand-alone and Modbus operation as a part of a larger CEL aviation light system network.

Key features

- 2,000cd (effective) RED fixed or flashing modes
- Extremely reliable - long lifetime
- Supports both stand-alone and Modbus operations
- Suitable for Offshore environment
- Incorporated GPS synchronisation
- Adjustable luminous output levels 10%, 30%, and 100%
- Incorporated photocell and fault monitoring
- WIFI interface
- Design lifetime more than 20 years
- 5yr warranty- the longest in the industry

Specifications met

- ICAO International Standards and Recommended Practices: Aerodromes Annex 14 Volume 1, 8th Edition, July 2018,
- Chapter 6: Medium-intensity, Type B/C Fixed Obstacle Light
- European Aviation Safety Agency - Chapter Q – Visual Aids for Denoting Obstacles CS-ADR-DSN.Q.848
- FAA Advisory Circular 150/534543F 09/12/06: L-864 and L-885
- CEL-WT-MIC - light measurement chart table - DEC2024

Optical characteristics

- 2,000cd (effective)
- Colour aviation RED
- NVG compliant infrared (850nm)
- Horizontal beam 360°
- Vertical beam 3°
- Maximum intensity at -1° is less than 1,110cd
- Maximum intensity at -10° is less than 56cd

Electrical characteristics

- Operating voltage 90-265VAC
- Constant power input at 95% by active PFC
- Flash rates: 20/30/40/60fpm
- Meets standards
- EMC (Emissions): EN 61000-6-4
- EMC (Immunity): EN 61000-6-2

DATASHEET

05 Dec 2024



Electrical characteristics - continued

- Power consumption
 - 17W @Night (RED, 40fpm)
 - 20W @Night (RED+IR, 40fpm)
 - 25W @Night (RED, fixed)
 - 30W @Night (RED+IR, fixed)
- Recommended cables (Outdoor):
 - Power (L-N-PE): 3x1,5mm² or 3x2,5mm²
 - Data: CAT 7
 - Alarm: CAT 7, 3x1,5mm² or 3x2,5mm²
 - Power + Data: 6x1,5mm² or 6x2,5mm²
- Input/Output terminals can be used to daisy chain power and data to additional lighthouses

Mechanical characteristics

- Painted marine grade aluminium body (C5MHigh)
- Glass cover
- Degree of protection IP66
- Operating temperature range -40...+55°C
- Mounting 240x240mm
- Height 333mm, diameter 270mm
- Weight 11kg

Additional Factory-installed Options

- Cold-climate version (CCV)
- NVG compliant infrared (IR)





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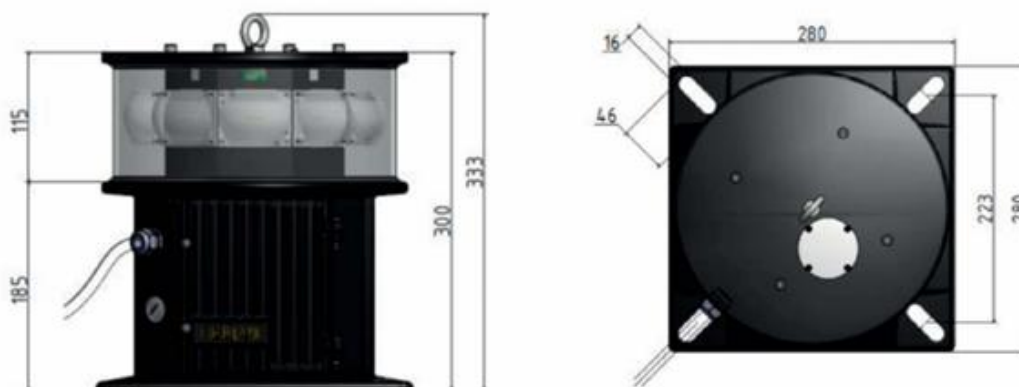
Medium Intensity Red 2,000cd Light

230VAC - LED Aircraft Warning Light

CEL-WT-MIC - StandAlone / Modbus

CEL-WT-MIC

Light unit with mounting dimensions



CEL-WT Versions

CEL-WT-MIB	Medium-intensity Type B (flashing) obstruction light, 2,000cd Red, GPS sync, Photocell, Alarm, 100-240VAC. Supports stand-alone and Modbus Network operation.
CEL-WT-MIC	Medium-intensity Type C (steady burn) obstruction light, 2,000cd Red, infrared, GPS sync, Photocell, Alarm, 100-240VAC. Supports stand-alone and Modbus Network operation.
CEL-WT-MIB-IR	Medium-intensity Type B (flashing) obstruction light, 2,000cd Red, Infrared 850nm, GPS sync, Photocell, Alarm, 100-240VAC. Supports stand-alone and Modbus Network operation.
CEL-WT-MIC-IR	Medium-intensity Type C (steady burn) obstruction light, 2,000cd Red, Infrared 850nm, GPS sync, Photocell, Alarm, 100-240VAC. Supports stand-alone and Modbus Network operation.

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