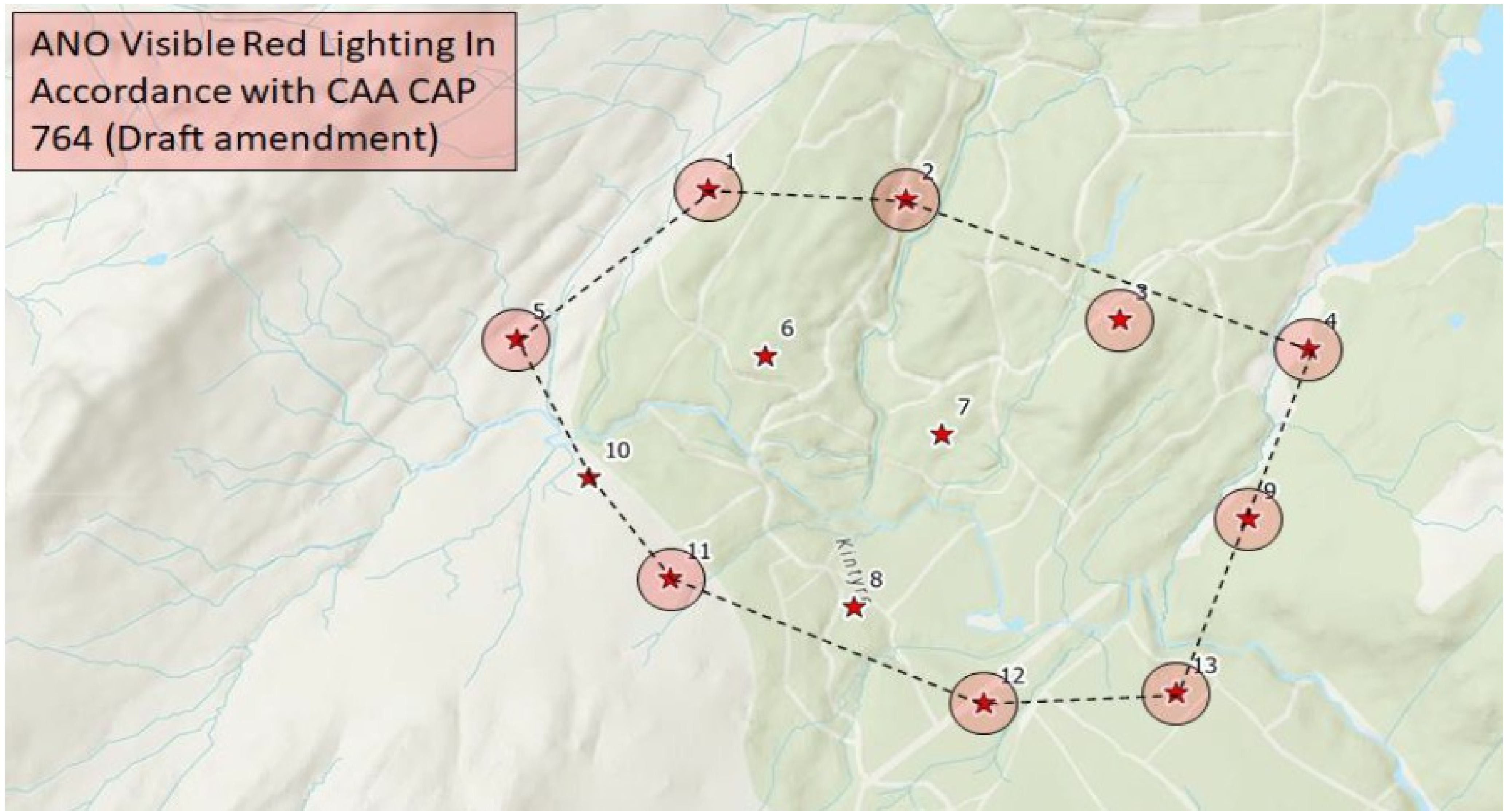


# Aviation Lighting

## Aviation Lighting Provision

All turbines above 150m to tip height require aviation lighting as per Aviation law. This is to warn lower flying aircraft of the presence of turbines at night, or during the daytime when visibility is less than 5km (e.g. fog, mist, storm).



The effects of this lighting depends on the relationship of the source (the turbine light) to the receptor (a person at a property, road, hilltop etc).

The physics of lighting suggests that if the source is above the receptor, the brightness received by the receptor will be lower than the theoretical maximum (e.g. 2000cd). The turbines will often be above people - and therefore the 2000cd brightness would not occur in reality. We have modelled brightness for all viewpoint locations and visualisations will be part of the EIA submission.

If the source is below the receptor (e.g. a hilltop), the light will be received brighter.

Vertical angle of lighting from nacelle (102.5m)	Maximum luminous intensity (Candela/cd)	10% Maximum luminous intensity (Candela/cd)
3° to 0°	2000cd +	200cd +
0° to -1°	750cd to 2000cd	75cd to 200cd
-1° to -2°	80cd to 750cd	8cd to 75cd
-2° to -3°	40cd to 80cd	4cd to 8cd
-3° to -4°	10cd to 40cd	1cd to 4cd
Below -4°	Below 10cd	Below 1cd

We have agreed a lighting scheme with the Civil Aviation Authority

It has been agreed that a perimeter lighting scheme for visible lights is acceptable. This means that 9 of 13 turbines will be lit at hub height (122.5m)

The standard lighting arrangement is for 2000 candela max lighting to be installed. In periods of <5km visibility, it is expected this lighting is on. When greater than 5km, then this can be dimmed to 10% (i.e. 200cd), making a big difference to the effects.

Not all turbines lights will be seen from all locations due to topography.

Indicative calculations suggest that instead of a maximum 2000cd light received at source, when lights are in <5km visibility mode, the real candela brightness will often be less than 500cd.

Indicative calculations also suggest, when combining historic weather and atmospheric records, the aviation lights may be at their brightest around 4% of the year (on 14 days of 365) Conversely, they are predicted to be operating at 10% brightness around 96% of the year (on 351 days of 365).