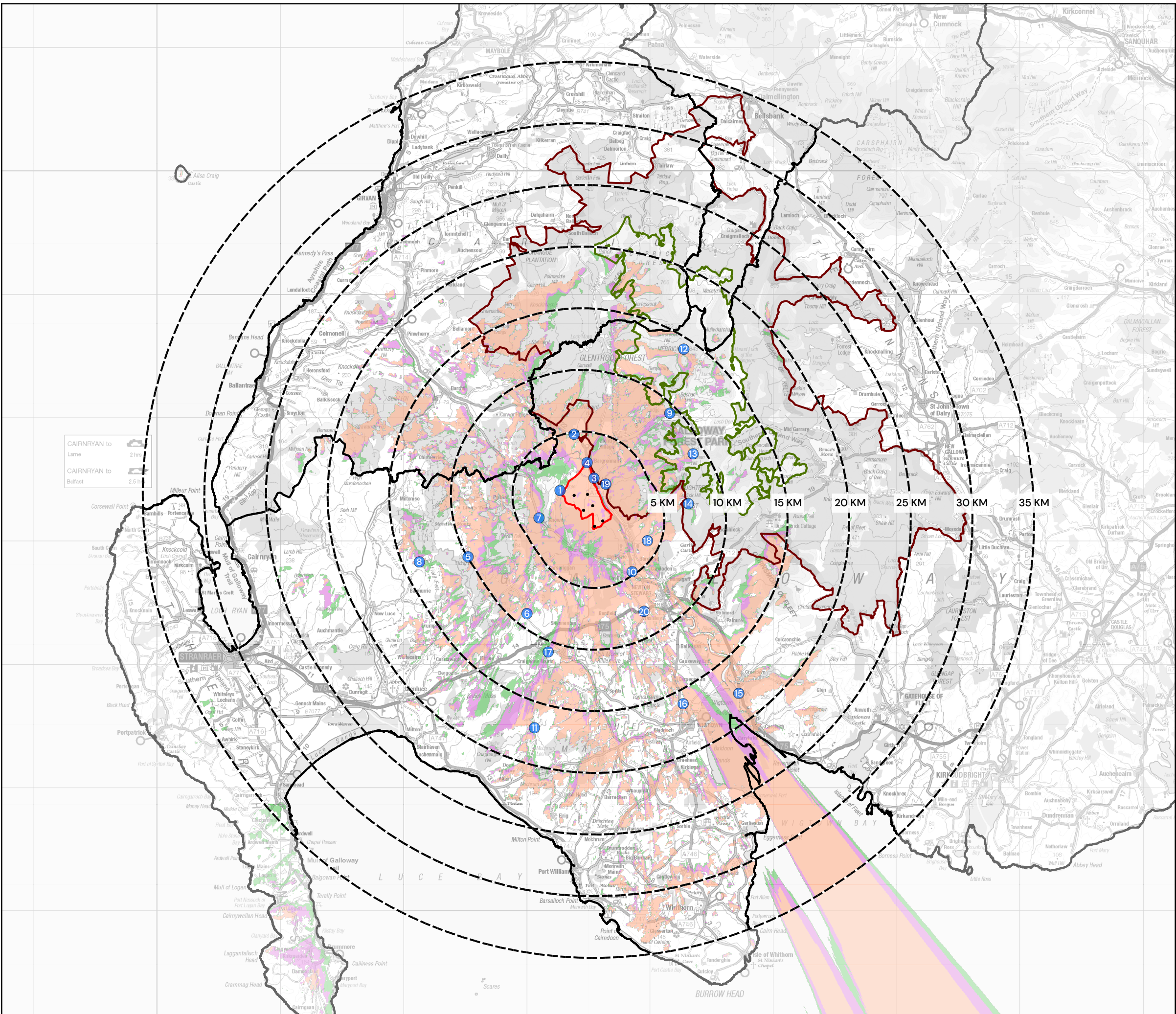




**KEY**

Planning Application Area

Proposed Lit Turbines

35km Study Area

District Boundary

LVIA Viewpoint

Galloway Dark Skies – Core Area

Galloway Dark Skies – Park Boundary

Lit Turbine Zone of Theoretical Visibility (115m)

1 to 2 lit hubs visible

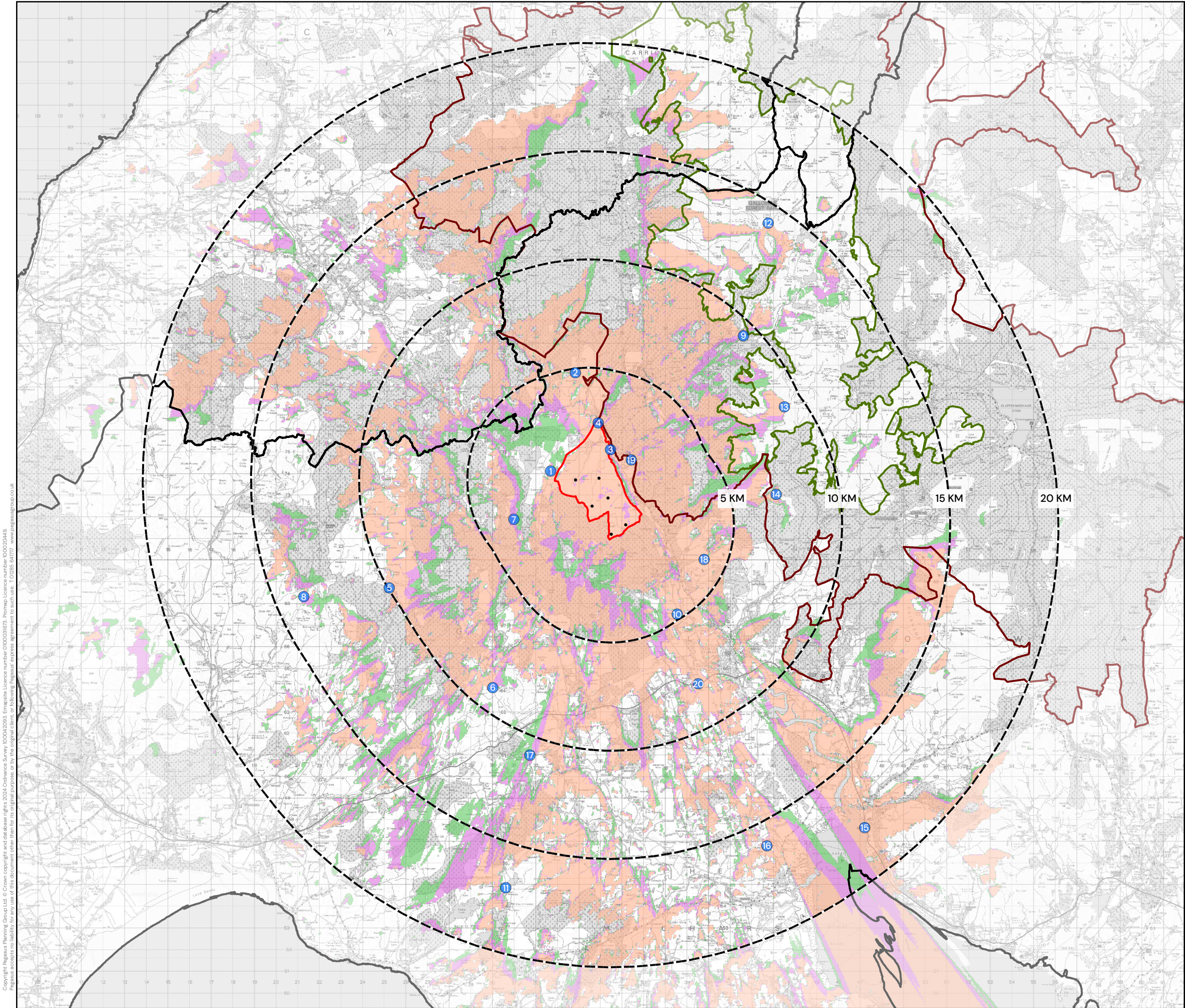
3 to 4 lit hubs visible

5 to 6 lit hubs visible

Figure 6.7.1: Lit Turbine ZTV up to 35km

Glenvernoch Wind Farm

|                        |                                  |
|------------------------|----------------------------------|
| Client:                | EnergieKontor                    |
| Drawn By:<br>NC        | Checked:<br>DT                   |
| Date:<br>18/10/2024    | Drawing Number<br>P23-1150_EN_39 |
| Scale:<br>1:300,000@A3 | Revision:<br>A                   |



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KEY

Planning Application Area

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Proposed Lit Turbines

20km Study Area

District Boundary

LVIA Viewpoint

Galloway Dark Skies – Core Area

Galloway Dark Skies – Park Boundary

Lit Turbine Zone of Theoretical Visibility (115m)

1 to 2 lit hubs visible

3 to 4 lit hubs visible

5 to 6 lit hubs visible

05 km

N

Figure 6.7.2: Lit Turbine ZTV up to 20km

Glenvernoch Wind Farm

Client:

EnergieKontor

Drawn By:

NC

Checked:

DT

Date:

18/10/2024

Drawing Number

P23-1150\_EN\_40

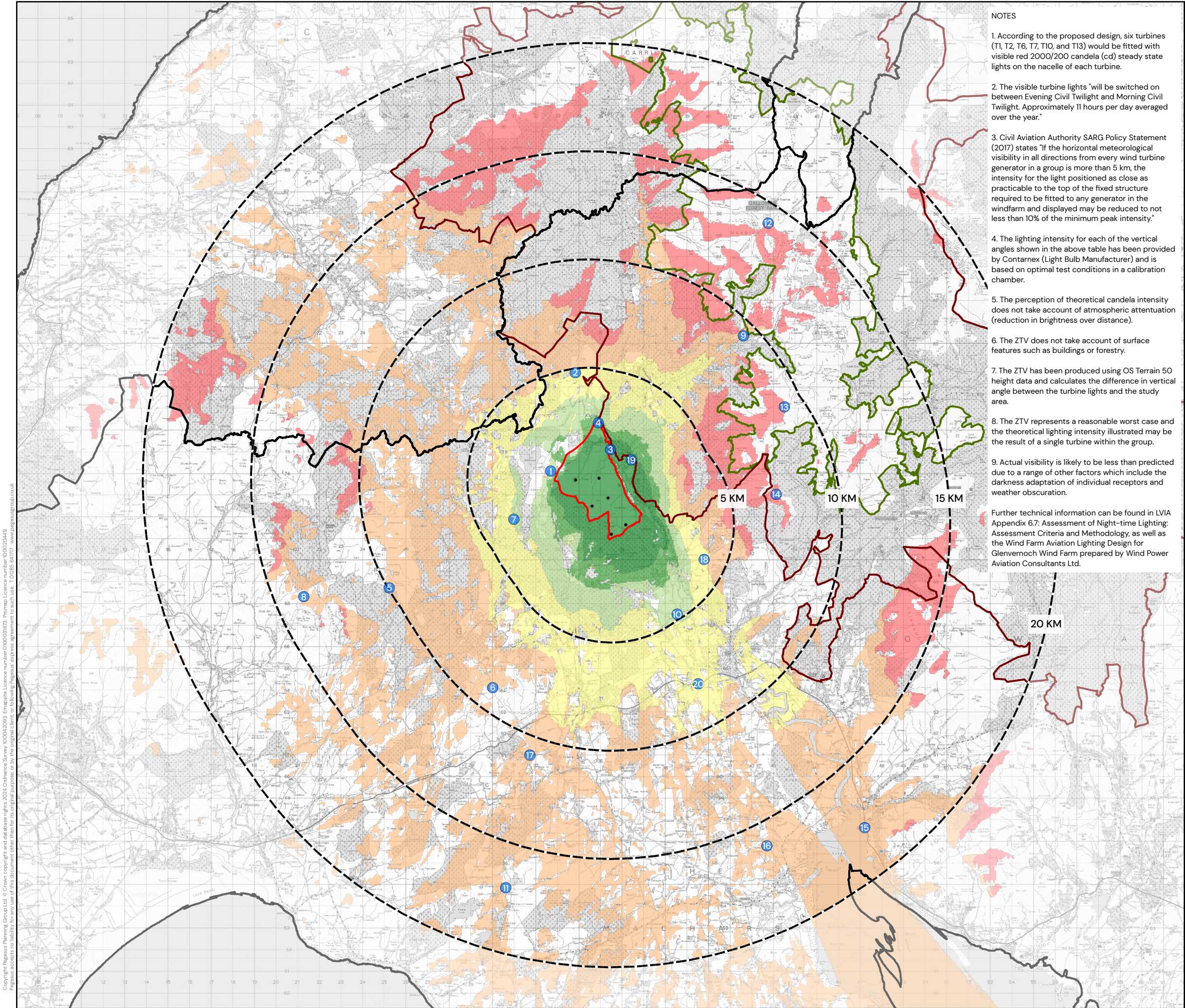
Scale:

1:170,000@A3

Revision:

A

PEGASUS GROUP



NOTES

1. According to the proposed design, six turbines (T1, T2, T6, T7, T10, and T13) would be fitted with visible red 2000/200 candela (cd) steady state lights on the nacelle of each turbine.
  2. The visible turbine lights "will be switched on between Evening Civil Twilight and Morning Civil Twilight. Approximately 11 hours per day averaged over the year."
  3. Civil Aviation Authority SARG Policy Statement (2017) 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."
  4. The lighting intensity for each of the vertical angles shown in the above table has been provided by Contarnex (Light Bulb Manufacturer) and is based on optimal test conditions in a calibration chamber.
  5. The perception of theoretical candela intensity does not take account of atmospheric attenuation (reduction in brightness over distance).
  6. The ZTV does not take account of surface features such as buildings or forestry.
  7. The ZTV has been produced using OS Terrain 50 height data and calculates the difference in vertical angle between the turbine lights and the study area.
  8. The ZTV represents a reasonable worst case and the theoretical lighting intensity illustrated may be the result of a single turbine within the group.
  9. Actual visibility is likely to be less than predicted due to a range of other factors which include the darkness adaptation of individual receptors and weather obscuration.
- Further technical information can be found in LVIA Appendix 6.7: Assessment of Night-time Lighting: Assessment Criteria and Methodology, as well as the Wind Farm Aviation Lighting Design for Glenvernoch Wind Farm prepared by Wind Power Aviation Consultants Ltd.

KEY

- Planning Application Area
- Proposed Lit Turbines
- 20km Study Area
- District Boundary
- LVIA Viewpoint
- Galloway Dark Skies - Core Area
- Galloway Dark Skies - Park Boundary

INTENSITY OF TURBINE LIGHT SHOWN IN CANDELA (CD)

| VERTICAL ANGLE | 2000 CD LIGHT     | 200 CD LIGHT    |
|----------------|-------------------|-----------------|
| 3° TO 0°       | UP TO 2500 CD     | UP TO 250 CD    |
| 0° TO -1°      | 2185 CD TO 982 CD | 218 CD TO 98 CD |
| -1° TO -2°     | 982 CD TO 413 CD  | 98 CD TO 41 CD  |
| -2° TO -3°     | 413 CD TO 217 CD  | 41 CD TO 21 CD  |
| -3° TO -4°     | 217 CD TO 172 CD  | 21 CD TO 17 CD  |
| BELOW -4°      | BELOW 172 CD      | BELOW 17 CD     |

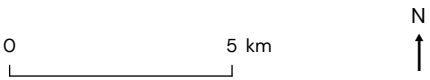


Figure 6.7.3: Lighting Intensity ZTV to 20km

Glenvernoch Wind Farm

|                        |                                  |
|------------------------|----------------------------------|
| Client:                | EnergieKontor                    |
| Drawn By:<br>NC        | Checked:<br>DT                   |
| Date:<br>18/10/2024    | Drawing Number<br>P23-1150_EN_42 |
| Scale:<br>1:170,000@A3 | Revision:<br>A                   |