



APPENDIX 15-7

AVIATION REVIEW
STATEMENT

Aviation Statement

Slievegrine Renewable Energy Development

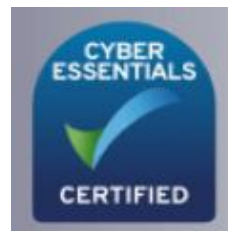
MKO

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www.cyrrus.co.uk

info@cyrrus.co.uk



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Document title	Aviation Statement
Author	Peter Foulsham
Reviewed by	Simon McPherson
Produced by	Cyrrus Limited Cyrrus House Concept Business Court Allendale Road Thirsk North Yorkshire YO7 3NY T: +44 (0) 1845 522 585 F: +44 (0) 8707 622 325 E: info@cyrrus.co.uk W: www.cyrrus.co.uk
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Executive Summary

The Proposed Wind Farm site is located within Class G, uncontrolled airspace with vertical limits of the Surface to Flight Level 75 (approximate altitude of 7,500 feet). This allows General Aviation flights to transit overhead the Proposed Wind Farm easily without being forced to fly in controlled airspace above, whilst still complying with minimum heights regulations. It is not situated within an airspace 'choke-point' and allows pilots more than sufficient room to deviate around the Proposed Wind Farm rather than overfly it, should they wish to.

MKO has received a response from the Department of Defence to a scoping request in which the Department of Defence noted the requirement for an aviation obstacle lighting scheme to be agreed. The Department of Defence held no view or noted the distance between the Proposed Wind Farm and the N25 national road to which the Irish Air Corps has historically commented on. This is likely due to the fact that the Proposed Wind Farm is located a significant distance from any Military Operating Areas within which low-flying training areas are located and to which the Air Corps navigate by use of the national road system.

Cork and Waterford Airports were consulted. Cork Airport did not comment on the Proposed Wind Farm but referred MKO to the Dublin Airport Authority (DAA), Waterford Airport has not responded to date. Instrument Flight Procedures may potentially be impacted at Waterford Airport which could be ascertained by an Instrument Flight Procedure assessment. Should these flight procedures be impacted by the Proposed Wind Farm, several forms of mitigation may be available to either the developer or the airport.

There is a radar installation at Tullig More located approximately 30 nautical miles (55 kilometres) from the Proposed Wind Farm. Cork Airport referred MKO to the Dublin Airport Authority who, with AirNav Ireland oversight, reviewed the development and stated it would have no impact on aviation.

Met Éireann operates two weather radar systems in Ireland at Dublin and Shannon Airports. Both radars are significant distances away from the Proposed Wind Farm as to be considered at no risk of impact by the Proposed Project.

Further details are contained within the report.

It is concluded that the Proposed Project represents a position of little to no impact on aviation.

Abbreviations

AGL	Above Ground Level
AMSL	Above Mean Sea Level
ATC	Air Traffic Control
CAS	Controlled Airspace
CTR	Control Zone
daa	Dublin Airport Authority
DOD	Department of Defence
FL	Flight Level
ft	feet
GA	General Aviation
IAA	Irish Aviation Authority
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedures
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
km	kilometre
m	metre
MOA	Military Operating Area
nm	nautical mile
PSR	Primary Surveillance Radar
RLoS	Radar Line of Sight
SERA	Standardised European Rules of the Air
SFC	Surface
SSR	Secondary Surveillance Radar
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

References

- [1] Standardised European Rules of the Air (SERA)
- [2] AirNav Ireland Electronic Integrated Aeronautical Information Package (online)
- [3] Met Éireann https://www.eumetnet.eu/wp-content/themes/aeron-child/observations-programme/current-activities/opera/database/OPERA_Database/index.html
- [4] Air Corps Wind Farm/Tall Structures Position Paper

Contents

EXECUTIVE SUMMARY	2
ABBREVIATIONS	3
REFERENCES	4
CONTENTS.....	5
1. INTRODUCTION	6
1.1. Overview	6
1.2. Response to Scoping	7
2. AIRSPACE ANALYSIS	9
2.1. Controlled and Uncontrolled Airspace.....	9
2.2. Statutory Instruments – S.I. No. 215/2005 – Irish Aviation Authority (Obstacles To Aircraft in Flight) Order, 2005	11
3. INSTRUMENT AND VISUAL FLYING.....	14
3.1. Overview	14
3.2. Visual / Instrument Meteorological Conditions.....	15
3.3. Rules of the Air - Minimum Heights.....	16
4. THE PROPOSED WIND FARM	17
4.1. Overview	17
5. CONCLUSION.....	20
5.1. Overview	20

List of figures

Figure 1: Indicative Turbine, Met. and Comms. Relay Mast Layout within the Proposed Wind Farm Site 6	
Figure 2: The Proposed Wind Farm shown relative to Controlled Airspace	10
Figure 3: Zoomed view of Proposed Wind Farm.....	10

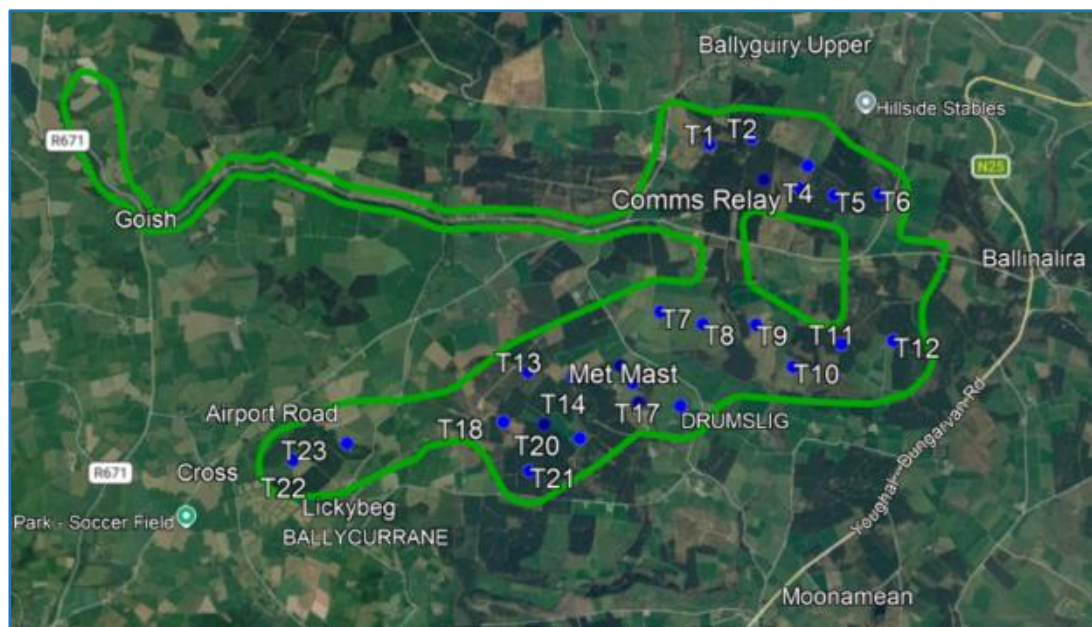
List of tables

Table 1: Summary of Stakeholder Responses	8
Table 2: VMC Visibility and Distance from Cloud Minima.....	15

1. Introduction

1.1. Overview

- 1.1.1. MKO Ireland is preparing an Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) to accompany a planning application, on behalf of Slievegrine Ltd, an associated company of Enerco Energy Ltd., for a proposed renewable energy development located at Lyre and surrounding townlands, approximately 4.7 kilometres (km) south of Dungarvan, Co. Waterford.
- 1.1.2. Slievegrine Renewable Energy Development is a Proposed Wind Farm to be located on a site close to the Cork and Waterford border in the province of Munster in the southern part of Ireland.
- 1.1.3. The Proposed Wind Farm is to comprise 23 number wind turbine generators (WTGs), a meteorological mast and a relay mast. The WTGs have an indicative layout as shown in **Figure 1** and are of varying maximum tip heights as follows:
 - Turbine (T) numbers T1 – T6 and T13 – T21 are at a design proposal height of 175 metres (m) Above Ground Level (AGL)
 - T7- T12 are 185m AGL
 - T22 and T23 are 170m AGL
 - Meteorological Mast – 80m AGL
 - Comms. Relay mast – 30m AGL



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Figure 1: Indicative Turbine, Met. and Comms. Relay Mast Layout within the Proposed Wind Farm

- 1.1.4. Aviation safeguarding endeavours to provide conservative results and commentary and therefore this report will consider heights as related to aviation using the highest WTGs calculated from machine height added to the elevation of turbine position/s.

- 1.1.5. T10 is the lowest tip height in terms of height Above Mean Sea Level (AMSL) at 322.38m AMSL with T13 the highest at 436.31m AMSL.
- 1.1.6. The Proposed Wind Farm is situated in Class G (uncontrolled) airspace. It is therefore outside of controlled airspace which contributes significantly to the notable absence of impact on General Aviation (GA) by the Proposed Wind Farm. The site also lies well outside of any restricted airspace used by the Department of Defence (DOD).

1.2. Response to Scoping

- 1.2.1. Table 1 below is a summary of MKO correspondence with stakeholders and responses received;

Stakeholder	MKO Correspondence	Date Sent	Stakeholder Response	Date Received
Defence Property Management Planning	Intention to prepare an EIAR. Description of Proposed Project.	1 July 2025	Forwarding of Department of Defence response (below).	16 July 2025
	Intention to prepare an EIAR reiterated. Updated constraints and designs scoping document was attached.	10 August 2026	Lighting scheme requirement was reiterated along with a request that, should there be negative impact to military radar systems, suitable mitigations will be agreed with the DoD.	28 August 2026
Department of Defence			DoD stated that the IAA were responsible for civilian flight safety whereas the DoD was responsible for military flight safety. Turbine lighting scheme requested. Any Irish Air Corps requirements were separate from IAA requirements. Request to be kept informed of progress of the Proposed project.	16 July 2025
Irish Aviation Authority	Intention to prepare an EIAR. Description of Proposed Project.	1 July 2025	IAA recommended that the Owner engaged with Waterford Airport, the ANSP AirNav Ireland, DoD, Irish Coast Guard Service and the Search and Rescue operator. Furthermore the IAA made the following observations: A lighting scheme should be agreed; Provision of as-constructed turbine positions, heights and ground elevations; notification of	7 July 2025

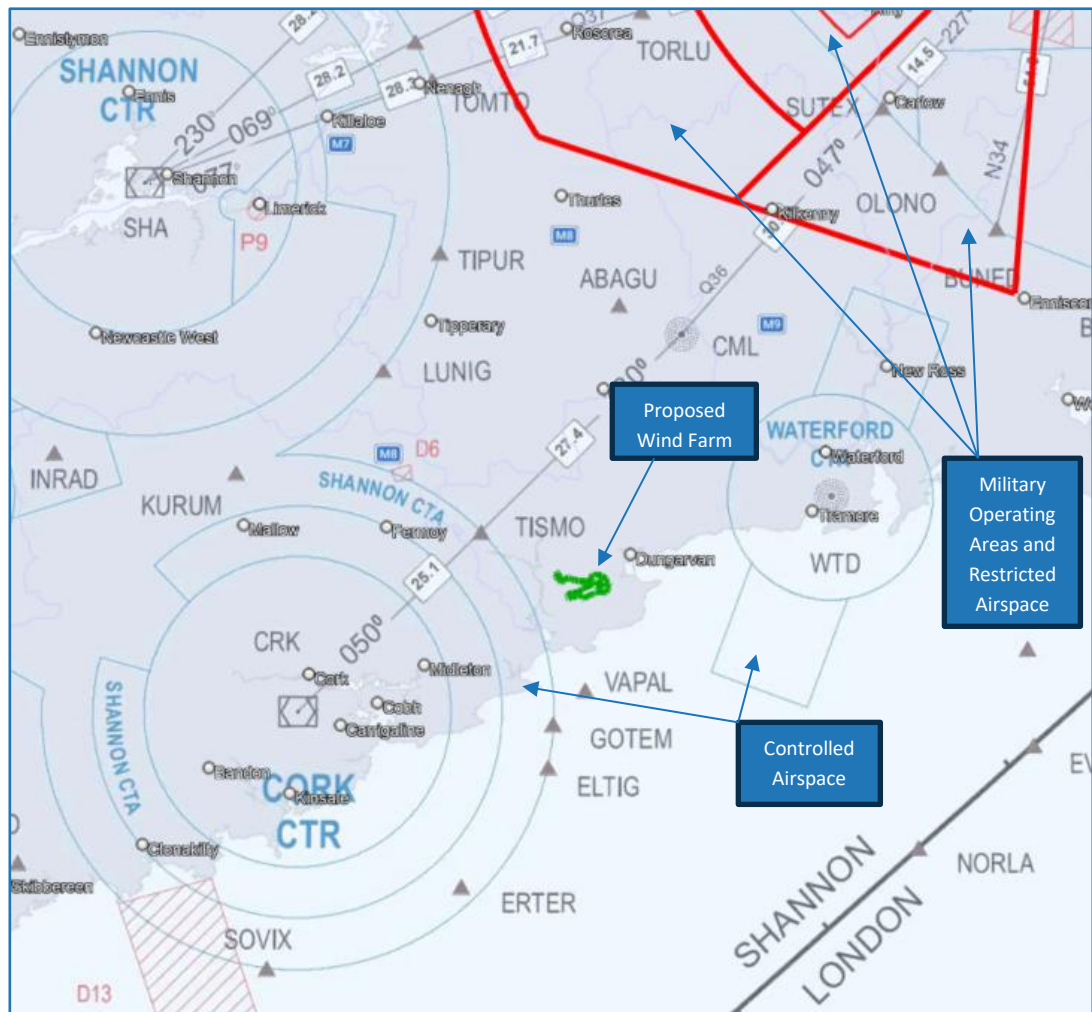
			intention to commence crane operations at least 30 days prior in accordance with S.I.215 of 2005 Obstacles to Aircraft in Flight (Order).	
	Intention to prepare an EIAR reiterated. Updated constraints and design scoping document attached.	10 August 2026	IAA recommended that the Owner engaged with Waterford Airport, the ANSP AirNav Ireland, DoD, Irish Coast Guard Service and the Search and Rescue operator. Furthermore the IAA made the following observations: A lighting scheme should be agreed; Provision of as-constructed turbine positions, heights and ground elevations; notification of intention to commence crane operations at least 30 days prior in accordance with S.I.215 of 2005 Obstacles to Aircraft in Flight (Order).	14 August 2026
Cork Airport	Intention to prepare an EIAR. Description of Proposed Project.	1 July 2025	Acknowledgement of contacting Cork Airport. Request to direct correspondence to daa.	4 July 2025
Dublin Airport Authority (daa)	Intention to prepare an EIAR. Description of Proposed Project.	16 July 2025	Request for position information of the proposed turbines in order for daa to provide a comprehensive response.	22 July 2025
	Intention to prepare EIAR reiterated. Updated constraints and design scoping document attached.	10 August 2026	daa consulted with AirNav Ireland and determined that no issues were identified in relation to the Proposed project. Once a planning application has been formally submitted, daa will undertake a further review of the application documentation.	3 September 2026

Table 1: Summary of Stakeholder Responses

2. Airspace Analysis

2.1. Controlled and Uncontrolled Airspace

- 2.1.1. Airspace, in general terms, is referred to as either controlled or uncontrolled and can be further divided into classes. Airspace is classed as A, B, C, D, E, F and G. Classes B, D, E and F are not used in the Republic of Ireland. Only Classes A, C and G are in use within Ireland, with Class A and C being examples of Controlled Airspace (CAS) and Class G being Uncontrolled Airspace. Aircraft in CAS are under positive control by Air Traffic Control (ATC) and must adhere to instructions such as route, altitude to fly and, often, speed control. In uncontrolled airspace pilots will fly without being controlled, or necessarily even monitored, by ATC and frequently also without being in communication with them. In certain uncontrolled airspace pilots can choose to contact ATC however, so as to take advantage of the enhanced situational awareness or arguably increased safety this brings to a flight. In such cases, ATC may be available – dependent on the level of ATC service provided (and ATC workload) – to provide flight monitoring, advice on aircraft-to-aircraft separation, and general flight support such as updates to weather information, and notice of whether restricted airspaces are available for transit.
- 2.1.2. Aircraft are flown under rules which govern how a flight is conducted, what navigational equipment an aircraft carries and different pilot certifications. If an aircraft is being flown with sole reference to on-board instrumentation, it is known as flight under Instrument Flight Rules (IFR) and if it is being flown by reference to the natural horizon (looking outside), it is termed Visual Flight Rules (VFR).
- 2.1.3. Aircraft are further flown with reference to different ‘heights’. If an aircraft is flown with reference to a local atmospheric pressure setting, it is said to be at an altitude AMSL. If it is flown with reference to an internationally mandated pressure setting (known as a ‘Standard Setting’) of 1013.25 Hectopascal, it is referred to as a Flight Level (FL).
- 2.1.4. An area of transition exists between these two different ‘height’ references known as the Transition Layer, which is made up of a lower boundary, termed the Transition Altitude and a top layer known as the Transition Level. Aircraft flying at or below the Transition Altitude fly with reference to the local atmospheric pressure and at or above the Transition Level with reference to the Standard Setting. The Transition Altitude at airports within the Shannon Flight Information Region (FIR) is 5,000 feet (ft) AMSL. This system allows aircraft to fly in proximity to one another with reference to a common datum, thereby facilitating separation by ATC or pilot-to-pilot of aircraft in uncontrolled airspace.
- 2.1.5. Just as aircraft use the above system to reference their altitude or Flight Level, so airspace has its vertical limits referenced in the same way. Thus, a section of airspace may have a lower limit, or base, of 3,500ft AMSL and an upper limit of FL250, or approximately (due to the pressure difference) 25,000ft AMSL.
- 2.1.6. **Figures 2 and 3** show the Proposed Wind Farm relative to CAS in Ireland.



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Figure 2: The Proposed Wind Farm shown relative to Controlled Airspace



Figure 3: Zoomed view of Proposed Wind Farm

2.2. Statutory Instruments – S.I. No. 215/2005 – Irish Aviation Authority (Obstacles To Aircraft in Flight) Order, 2005

2.2.1. What constitutes an obstacle to aircraft is explained by the legal instrument below.

2.2.2. Statutory Instrument (S.I) 215 of 2005 outlines the following:

- Applicability
- Definition of an Obstacle
- Reporting and Information in respect of Obstacles
- Marking and Lighting of Obstacles
- Directions
- Guidance Material

2.2.3. **Applicability** - *This Order shall apply to existing and proposed manmade objects of permanent or temporary construction or alteration and apparatus of a permanent or temporary nature or any alteration thereto objects of natural growth and terrain. The standards shall apply to the use of navigable airspace by aircraft and to existing or proposed air navigation facilities, licensed aerodromes, air traffic services routes including approach and departure routes to and from instrument and other runways.*

2.2.4. **Definition of an Obstacle** - *An existing object, including a mobile object, is and a future object would be, an obstacle to air navigation if it is of greater height than any of the following heights or surfaces:*

(a) A height of 45 metres above ground or water surface level at the site of the object or an object which otherwise constitutes an en-route obstacle or a potential en-route obstacle in accordance with this Order;

(b) A height within a runway approach area, a runway departure area or a circling approach area, which would result in the vertical distance between any point on the object and the established minimum instrument flight altitude or height as specified for the aerodrome concerned in the "AIP Ireland" within that area to be less than the required obstacle clearance. The analysis of the significance of such obstacles may have to be determined by an aeronautical study in accordance with subparagraph (4) of Article 5 of this Order;

(d) The surface of an obstacle protection surface as defined in Chapter 5 of Annex 14 to the Convention;

(e) An inclined plane surface, with a slope of either 1.2 per cent or 1.0 per cent superimposed on a take-off flight path area and extending either to 10 kilometres or 12 kilometres respectively from the end of the runway concerned as specified in Chapter 3 of Annex 4.

(2) The surfaces specified in paragraph (1) above may also be defined in relation to a specific aerodrome on a safeguarding map prepared by or on behalf of the aerodrome licensee and lodged with the local Authority responsible for planning in the vicinity of that aerodrome under the Planning and Development Act 2000 .

(3) *The dimensions, orientation and characteristics of these surfaces are defined in Annexes 4 and 14 to the Convention as appropriate in relation to runway size and use at the aerodrome concerned.*

2.2.5. Reporting and Information in respect of Obstacles –

(1) *A person shall not cause to be erected or constructed an object as defined in sub-paragraph (a) of paragraph (1) of Article 4 of this Order without first notifying the Authority in writing of that intended erection or construction at least thirty days prior to such erection or construction and shall provide such information in relation thereto to the Authority as may be requested under paragraph (3) of this Article.*

(Note: This requirement is separate from any permission required to be obtained under the Planning and Development Act, 2000 in respect of the said erection or construction).

(2) *A person shall not cause to be erected or constructed any object as defined in Article 4 of this Order within a radius of 10 kilometres of a licensed aerodrome without first notifying the aerodrome licensee of that aerodrome in writing of that intended erection or construction at least thirty days prior to such erection or construction and shall, additionally and where requested provide such information in relation thereto to the Authority as may be required under paragraph (3) of this Article.*

(Note: This requirement is separate from any permission required to be obtained under the Planning and Development Act, 2000 in respect of the said erection or construction).

(3) *The Authority may require a person as specified in paragraphs (1) or (2) of this Article to make available to it information relating to an obstacle, including its geographic latitude and longitude, elevation and height.*

(4) *The Authority may require the conduct of an aeronautical study for the purposes of sub-paragraph (b) of paragraph (1) of Article 4 of this Order or otherwise if it considers it necessary in a particular case.*

2.2.6. Marking and Lighting of Obstacles –

The Authority may require the marking and lighting of an obstacle defined in accordance with Article 4 of this Order in accordance with such instructions as the Authority may give in a particular case or by a direction under this Order to a person as specified in paragraphs (1) or (2) of Article 5 of this Order or to any other person or organisation as appropriate.

2.2.7. Direction –

The Authority may give directions in relation to such matters to which the Order relates. Directions under this Order may be issued as Notices to Aerodrome Licensees, Aeronautical Information Circulars, by public notice or by private notice in writing sent by post or by electronic means to the organisation, person or persons affected.

2.2.8. Guidance Material –

The Authority may from time to time publish or otherwise provide guidance documentation on the determination and classification of obstacles for the purposes of this Order.

3. Instrument and Visual Flying

3.1. Overview

- 3.1.1. The Republic of Ireland is a signatory to the International Civil Aviation Organisation (ICAO) and as such follows and adopts the Standards and Recommended Practices. In turn, Ireland, being an EU Member State, is aligned with the Standardised European Rules of the Air (SERA). Under ICAO, member states file differences in their country's rules and regulations to those of ICAO. These are then published as part of the country's Aeronautical Information System.
- 3.1.2. As explained previously (para.2.1.2), aircraft are flown under one of two rules: IFR or VFR. Flight under IFR requires far more preparation than does VFR flight as, although the IFR flight may take place in benign weather conditions, it can equally be conducted in very poor conditions where visibility is at, or almost, zero. In general, the IFR flight is conducted in accordance with rules that must assume the pilot cannot see anything outside. Minimum altitudes, procedures, obstacle, and terrain clearance must all assume the pilot is flying with no outside visual reference at all and are therefore very strictly devised, published, and adhered to. IFR aircraft use ground-based electronic navigation aids and, increasingly, satellite-based en-route navigation and approach procedures.
- 3.1.3. During flight under VFR, the pilot is responsible for avoiding obstacles and terrain by directly positioning the aircraft by looking out the window. The aircraft is also navigated using maps (electronic or paper) and by using prominent landmarks such as roads, railway lines, towns, and lakes. Electronic navigation aids are frequently used (if the pilot is qualified to do so), but the primary focus remains that of visual navigation.
- 3.1.4. IFR flight, depending on the ATC service being provided, and the airspace it is being provided in, is very dependent on ATC for determining where the aircraft is routed and at what altitude/level it flies. Visual flight, which to a large extent is conducted in uncontrolled airspace, is largely the responsibility of the pilot. They are responsible for remaining in the airspace they have chosen to fly within, or in which they are permitted to fly, as well as being responsible for avoidance of terrain and obstacles in compliance with the Rules of the Air.
- 3.1.5. In determining to what rules aircraft flying in the vicinity of the proposed windfarm site may be subject, we must consider the following extracts from SERA.
- 3.1.6. SERA.2005 *Compliance with the rules of the air*, states:
- ‘The operation of an aircraft either in flight, on the movement area of an aerodrome or at an operating site shall be in compliance with the general rules, the applicable local provisions and, in addition, when in flight, either with:
- (a) *the visual flight rules; or*
- (b) *the instrument flight rules*’.
- 3.1.7. Therefore, we can clearly see that any flight *must* be conducted in accordance with one of the above.

3.2. Visual / Instrument Meteorological Conditions

- 3.2.1. A pilot flying in accordance with VFR must, as explained, be looking out of the windscreen, and flying with visual reference to the ground and the natural horizon. In order to do this the weather conditions must also be able to support that flying. This is termed Visual Meteorological Conditions (VMC). Thus, an aircraft flying in accordance with VFR flies in VMC.
- 3.2.2. A pilot flying in accordance with IFR would, as explained, be operating, and navigating the aircraft by sole reference to the flight and navigation instruments fitted in the aircraft. Apart from the obvious exception of thunderstorms, extreme weather, and icing, the IFR pilot is not concerned with weather conditions per se and has no requirement to be able to see outside. The pilot is required to be able to see outside during take-off and in the final stages of landing. Weather that requires this type of instrument flying is termed Instrument Meteorological Conditions (IMC).
- 3.2.3. A VFR pilot may only fly in VMC; but an IFR pilot may fly in both VMC and IMC.
- 3.2.4. The VMC weather minima are shown in **Table 1** below:

Altitude Band	Airspace Class	Flight Visibility	Distance from Cloud
At and above 3050m (10000ft) AMSL	A - G	8 KM	1500m horizontally and 300m(1000ft) vertically
Below 3050m (10000ft) AMSL and above 900m (3000ft) AMSL, or above 300m (1000ft) above terrain, whichever is higher	A - G	5 KM	1500m horizontally and 300m (1000ft) vertically
At and below 900m (3000ft) AMSL, or 300m (1000ft) above terrain, whichever is higher	A - E	5 KM	1500m horizontally and 300m (1000ft) vertically
	F and G	5 KM(*)	Clear of cloud and in sight of the surface

© Standardised European Rules of the Air (SERA)

Table 2: VMC Visibility and Distance from Cloud Minima

(*) When so prescribed by the competent authority:

(a) Flight visibility reduced to not less than 1500m may be permitted for flights operating:

1. at speeds of 140 Kts IAS or less to give adequate opportunity to observe other traffic or any obstacles in time to avoid collisions; or
2. In circumstances in which the probability of encounters with other traffic would normally be low, e.g. in areas of low volume of traffic and for aerial work at low levels;

(b) helicopters may be permitted to operate in less than 1500m but not less than 800m flight visibility, if manoeuvred at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.

3.3. Rules of the Air - Minimum Heights

- 3.3.1. The table above clearly states the flight visibility and distance from cloud requirements associated with lower-altitude flight. In Class G airspace, at and below 900m (3,000ft) AMSL, or 300m (1,000ft) above terrain, whichever is higher, the flight visibility required is 5km. This can be reduced for helicopters to 1,500m, but not less than 800m.
- 3.3.2. However, what does not change is the distance from cloud requirement which maintains a condition to fly 'clear of cloud and in sight of the ground'.
- 3.3.3. In order to comply with this condition a pilot cannot simply fly beneath cloud at a very low altitude. The pilot is required to observe a rule which prevents low level flight in order to simply comply with the VMC table. This rule is known as Minimum Heights.
- 3.3.4. SERA .3105 *Minimum heights* states:
- 3.3.5. *'Except when necessary for take-off or landing, or except by permission from the competent authority, aircraft shall not be flown over the congested areas of cities, towns or settlements or over an openair assembly of persons, unless at such a height as will permit, in the event of an emergency arising, a landing to be made without undue hazard to persons or property on the surface. The minimum heights for VFR flights shall be those specified in SERA.5005(f) and minimum levels for IFR flights shall be those specified in SERA.5015(b)'.*
- 3.3.6. This simply means that, in the first instance, any flight must be at such an altitude or Flight Level that will enable it to, as much as circumstances permit, land clear of any persons or property. Put another way, it means that any aircraft must fly high enough so as to be able to glide or otherwise, away from people or property on the ground if it experiences any malfunction which prevents the aircraft from remaining airborne.
- 3.3.7. SERA.5005(f) – (Minimum heights for) *Visual flight rules*, states:
- 3.3.8. *f) Except when necessary for take-off or landing, or except by permission from the competent authority, a VFR flight shall not be flown:*
- 3.3.9. *(1) over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height less than 300 m (1 000 ft) above the highest obstacle within a radius of 600 m from the aircraft;*
- (2) elsewhere than as specified in (1), at a height less than 150 m (500 ft) above the ground or water, or 150 m (500 ft) above the highest obstacle within a radius of 150 m (500 ft) from the aircraft.*
- 3.3.10. It is assumed the paragraph in (2) would be relevant to the Proposed Wind Farm's location.

4. The Proposed Wind Farm

4.1. Overview

- 4.1.1. The Proposed Wind Farm is situated in Class G (uncontrolled) airspace. Outside of the Control Zones (CTRs) associated with Cork, Shannon and Dublin Airports, Class G airspace extends from the surface of the earth (SFC) to Flight Level 75 (approximately 7,500ft AMSL) – the approximation accounted for by variations between prevailing atmospheric pressure and ‘standard settings’ in use above 5,000 ft.
- 4.1.2. Although wind turbines *do* constitute an obstacle to aviation, the risk is managed through regulation and the regulated dissemination of obstacle information to the sector.
- 4.1.3. Obstacles are encountered everywhere in aviation. From airport equipment as aircraft manoeuvre around an airport, to terrain en-route - obstacle such as trees, buildings, masts and wind turbines in the vicinity of the airport, are required to be avoided by pilots.
- 4.1.4. Whilst flying VFR, pilots are responsible for identifying obstacles and flying their aircraft a safe distance from them in a process known as ‘see-and-avoid’. This, for the most part, also applies to avoiding other aircraft in the vicinity as well.
- 4.1.5. IFR flight is different in that the pilot may be in weather conditions that preclude them from seeing obstacles such as terrain, buildings, masts and, indeed, other aircraft. Therefore, far stricter criteria and regulation is applied to the IFR flight. Flight paths across countries are safeguarded against high terrain and once the aircraft descends towards an airport it will enter a highly regulated and designed environment of procedures that are safeguarded by very specific criteria in order to land safely – sometimes in little or zero visibility.
- 4.1.6. Thus, there is a completely different approach when comparing the two different flight rules.
- 4.1.7. The Proposed Wind Farm is in the enviable position of having sufficient airspace above it to accommodate VFR and IFR aircraft complying with minimum heights regulation.
- 4.1.8. Many wind farms are situated within airspace which has overlying controlled airspace which has a base of only several hundreds of feet or less above the wind farm. This can cause serious issues as VFR aircraft are then forced to request ATC clearance to climb into the overlying controlled airspace in order to comply with minimum heights rules which they may not want to do or, indeed, may not be qualified to do if the presence of cloud would require a change of flight rules to IFR. The aircraft would then be forced to alter its route and fly around a wind farm rather than over it. This scenario must be balanced with the fact that, unless a relatively higher altitude were available, most pilots would, in the interests of good airmanship, not overfly a wind farm at an altitude that only just complied with minimum heights rules. Should an inflight emergency occur above the wind farm at a relatively low altitude, there may be very few options available to the pilot to avoid the wind turbines.
- 4.1.9. Nevertheless, this Proposed Wind Farm position remains one of little or no impact to GA flights.

- 4.1.10. As stated in paragraph 1.1.5, the highest turbine expressed in terms of *altitude* or *height above mean sea level* is T13 at 436.31m AMSL.
- 4.1.11. This is 1,432ft AMSL (rounded up) and therefore provides approximately 6,068 feet of Class G airspace above the highest turbine at the Proposed Wind Farm.
- 4.1.12. Given that an aircraft flying in accordance with VFR requires a minimum vertical distance of 500ft when passing the highest obstacle (terrain or man-made) within 500ft laterally of the aircraft, this allows the aircraft to fly at an altitude of 1932ft (which would be flown at an altitude of 2000ft by all pilots) and fully comply with minimum heights regulation.
- 4.1.13. GA flying remains a popular past time to many in Ireland and the Cork / Waterford area would be a popular area in which to enjoy the hobby. The Proposed Turbines would present no negative impact to this flying at all.
- 4.1.14. During scoping, a response was received by the MKO from Defence Property Management Planning noting the following:
- *All turbines should be illuminated by Type C, Medium intensity, Fixed Red obstacle lighting with a minimum output of 2,000 candela to be visible in all directions of azimuth and to be operational H24/7 days a week. Obstacle lighting should be incandescent. If LED or other lighting types are used, should be a type visible to Night Vision equipment. Obstacle lighting must emit light at the near Infra-Red (IR) range of the electromagnetic spectrum, specifically at or near 850 nanometres (nm) of wavelength. Light intensity to be of similar value to that emitted in the visible spectrum of light.*
 - *In the event of negative impacts on future military radar systems, the owner will engage with the Department of Defence and will provide suitable mitigations as soon as practical.*
- 4.1.15. A lighting scheme as requested above would be provided by the developer in order to comply with aviation regulation.
- 4.1.16. The Proposed Wind Farm is located within 3 nautical miles (nm) of a national road – the N25. The Irish Air Corps have previously noted this distance as one which they have felt provides their aircraft with a ‘buffer’ between proposed tall structures, including wind turbines, and national roads along which they may be navigating whilst transiting between low flying training areas.
- 4.1.17. There are no such training areas near the Proposed Wind Farm. The closest Military Operating Areas (MOAs) located southwest of Casement Aerodrome at Baldonnel, are MOAs 3 and 5 which are 38nm (70km) from the Proposed Wind Farm. It should be noted that no request or observation was made by the DOD in this regard.
- 4.1.18. Instrument Flight Procedures (IFPs) are a complex series of unseen ‘pathways’ at, and in the vicinity of, an airport equipped with the necessary ground (or space-based) equipment to support the designed procedure/s that make up these ‘pathways’. The procedures are protected by another complex set of prescribed, protective surfaces which can extend out to 25nm. IFP assessment is, by convention, carried out when a new obstacle is introduced to the area within 30nm (25nm + a 5nm ‘buffer’). This specialist assessment will determine if the obstacle/s impact on the procedure and/or its protective surfaces.

- 4.1.19. Both Cork and Waterford Airports have IFPs associated with them. Cork Airport is just over 30nm from the Proposed Wind Farm and is unlikely to require assessment; however, Waterford would appear to be 23.5nm from the closest proposed turbine (T6) which is within the 25nm assessment radius and well within the 30nm zone which includes the buffer zone. MKO Ireland contacted Waterford Airport on 10 August 2026 and have not received a response to date. MKO contacted Cork Airport who subsequently referred MKO to daa who reviewed the development in conjunction with AirNav Ireland. The daa determined that there would be no impact on aviation from the Proposed Project.
- 4.1.20. Primary Surveillance Radar (PSR) and Secondary Surveillance Radar (SSR) can be impacted by *operational* wind turbines. The turning blades, dependent on turbine orientation to the radar antenna, can impart a Doppler frequency shift to the reflected, returning PSR signal which can confuse the radar targeting software into perceiving the turning blades as an aircraft target. This is a very common and very well understood phenomenon and can, in most cases, be mitigated by software optimisation by the radar manufacture in conjunction with the Air Traffic Services Unit which uses the radar feed.
- 4.1.21. SSR systems utilise a different operating principle and are subject to reflection issues; however, this is at vastly shorter distances and Eurocontrol guidance notes a distance of 16km between the radar antenna and a wind farm within which assessment and mitigation should be considered.
- 4.1.22. The closest PSR/SSR antenna would appear to be at Tullig More, Co. Cork which is slightly over 56km southwest of the closest turbine (T22) at the Proposed Wind Farm. Therefore, an SSR system antenna would not be impacted. However, PSR can be impacted at great distances and is dependant on determination of Radar Line of Sight (RLoS) to understand whether potential exists for impact from a wind turbine.
- 4.1.23. Weather radar also utilises PSR as its principle of operation (reflected return signals) but in this case the returning signals would be from the presence of water in the atmosphere in the form of cloud, rain, hail, etc. The weather service use radar to detect and warn of severe weather such as thunderstorms. Wind turbines *may* cause electronic noise and clutter on weather radar displays thus potentially obscuring valid weather return signals.
- 4.1.24. Met Éireann (the Irish Meteorological Service) operates two weather radars, one at Dublin Airport and the other at Shannon Airport. These radar antennas are at distances of 180km and 108km respectively from the Proposed Wind Farm and will not be impacted.

5. Conclusion

5.1. Overview

- 5.1.1. The Proposed Wind Farm is situated in Class G uncontrolled airspace and sited approximately midway between Waterford to the north of the Proposed Wind Farm and Cork to the south.
- 5.1.2. The Class G airspace within which the Proposed Wind Farm is situated has vertical dimensions of SFC to FL75, affording the site the utility of unrestricted flight (within the realms of the regulations of Class G airspace) above the proposed wind turbines. This position allows the Proposed Wind Farm to be planned in the knowledge that GA flight is not impacted to any degree apart from presenting as an obstacle to flight which is a common occurrence in aviation.
- 5.1.3. Obstacles are a fundamental element of flight. Natural terrain, vegetation and man-made structures are accounted for by aviation charts, notification and regulation. More importantly, every pilot has a responsibility in terms of aviation regulation to plan routes in airspace and to familiarise themselves with predicted weather and obstacles along the route.
- 5.1.4. Visual flight dictates that an aircraft maintains at least 500ft above any obstacle within 500ft of the aircraft. Using the highest of the proposed turbines (T13) at 436.31m (1,432ft) AMSL as an example of what a pilot would be required to do in order to comply with minimum heights regulation whilst overflying the Proposed Wind Farm, and adding the required 500 feet, a required altitude of 1,932ft is calculated.
- 5.1.5. A pilot would adjust the above figure to an altitude of 2,000ft for a legal flight over the Proposed Wind Farm. This allows the aircraft to remain well within Class G airspace and does not force the pilot to fly in airspace they neither want to or may not be qualified to do so if poor weather were above the aircraft.
- 5.1.6. The pilot is also not unduly restricted by the Proposed Wind Farm being sited between two sectors of controlled airspace (associated with Cork Airport and Waterford Airport). A pilot could choose to deviate around the Proposed Wind Farm should they choose to with no risk of infringing either Waterford or Cork controlled airspace.
- 5.1.7. MKO have consulted with Cork and Waterford Airports as well as the DOD. Potential impact to instrument flight procedures at Waterford Airport *may* be indicated by the Proposed Wind Farm's location. However, Waterford Airport has not responded to date. Cork Airport did not comment on the initial contact with the airport apart from referring MKO to daa. The Proposed Wind Farm was determined to have no impact on aviation when daa, in conjunction with AirNav Ireland, reviewed the Proposed Project. Should Waterford indicate IFP as a potential impact, an IFP assessment can easily be conducted and mitigation proposed *if* an impact were noted.
- 5.1.8. The DOD indicated that a lighting scheme would be required and agreed to, turbine positions, ground elevations and tip heights at each turbine location provided, and to notify the Authority of the intention to start any crane operations.

- 5.1.9. Although the Proposed Wind Farm is situated within 3nm of the N25 national road, which the Irish Air Corps have historically noted as being less than the distance they require as a buffer between national roads and tall structures, this was not stated in the response from the DOD. The Air Corps use the national road system to navigate between training areas within Military Operating Areas and Restricted Airspace. There are no training areas or MOAs in the vicinity of the Proposed Wind Farm and no request or observation was made by the DOD in this regard.
- 5.1.10. Tullig More Radar is approximately 31nm to the southwest of the Proposed Wind Farm. Whilst any SSR element of this system would not be impacted, nor require assessment, any PSR system at that location *may* require Radar Line of Sight assessment to determine the potential for impact by the proposed wind turbines. *If* line of sight were determined and the potential for impact assessed, mitigation *may* be required. Several mitigation measures are available including software optimisation by the radar manufacturer.
- 5.1.11. Met Éireann (the Irish Meteorological Service) operates two weather radars, one at Dublin Airport and the other at Shannon Airport. These radar antennas are at distances of 180km and 108km respectively from the Proposed Wind Farm and will not be impacted.
- 5.1.12. **It must be concluded that the Proposed Wind Farm is in a position of realistic determination of a low potential for impact on aviation.**



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