

From: [Aidan O'Brien](#)
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Subject: ABP-320705-24 - Knockshanvo Wind Farm - East Clare Environment Protection CLG Submission
Date: Wednesday 29 July 2026 15:42:36
Attachments: [East Clare Environment Protection CLG-Knockshanvo FI Response-29 July 2026.pdf](#)
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Dear Sir/Madam,

Please find attached the submission of East Clare Environment Protection CLG in response to the Further Information submitted in respect of the proposed Knockshanvo Wind Farm, Case Reference ABP-320705-24.

I would be grateful if you could confirm receipt of this submission.

Kind regards,

Aidan O'Brien
East Clare Environment Protection CLG

Submission to An Coimisiún Pleanála in Response to Further Information

Proposed Knockshanvo Windfarm

Windfarm Application: ABP-320705-24

Grid Connection Application: ABP-320727-24

29th July 2026

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2. Executive Summary

Purpose of this Submission

This submission is made by **East Clare Environment Protection CLG (“the CLG”)** to **An Coimisiún Pleanála (“the Commission”)** in response to the Further Information and associated **Responses to Observations submitted by FuturEnergy Knockshanvo DAC (“the Applicant”)**, part of **FuturEnergy Ireland** in respect of the proposed Knockshanvo Wind Farm.

The CLG has reviewed the Applicant's Further Information as a whole, including the principal Response to Observations, the associated specialist technical responses and the detailed aviation response. This submission concentrates upon those responses which remain material to the Commission's determination.

The CLG acknowledges that the Further Information provides additional clarification and, in a number of instances, addresses information or presentation deficiencies identified in the original planning documentation. This submission does not seek to maintain objections where the Applicant has adequately resolved the matter concerned.

However, having considered the Further Information against the complete planning record, the CLG considers that a number of **fundamental planning and environmental issues remain unresolved**. In several instances, the Applicant's response does not remove the underlying concern but instead relies upon future monitoring, future management, further technical assessment, subsequent agreement with third parties or post-consent mitigation.

The most significant unresolved matters concern:

- the relationship between **Knockshanvo and Oatfield** and the resulting cumulative environmental effects;
- **landscape and visual effects** within the Slieve Bernagh uplands;
- **Hen Harrier and habitat compensation/enhancement measures**;
- **hydrology, peatland, Gortacullin Bog NHA, private water supplies and Water Framework Directive compliance**;



- **noise, public health and the cumulative alteration of the existing quiet rural acoustic environment;** and
- most critically, the unresolved **aviation safeguarding issues affecting Shannon Airport, Instrument Flight Procedures and the Woodcock Hill surveillance radar.**

These matters are not peripheral to the assessment. They concern the fundamental environmental acceptability, and, in the case of aviation, the safe deliverability of the development proposed.

Relationship between Knockshanvo and Oatfield

A recurring issue throughout the Applicant's Further Information is the exceptionally close relationship between the proposed Knockshanvo Wind Farm and the proposed Oatfield Wind Farm.

The two developments are not simply unrelated wind farms situated within the same general region. They occupy the same wider upland landscape and, if both proceed, would result in **20 large-scale turbines** operating within the immediate Knockshanvo/Oatfield area.

The CLG acknowledges that Knockshanvo and Oatfield are separate planning applications and that each application must be determined on its own merits.

However, their separate planning identities cannot be allowed to obscure their combined environmental consequences.

For surrounding residents, designated and sensitive habitats, water catchments, landscape receptors and aviation infrastructure, the effects arise from the developments as they would actually exist on the ground.

The Commission must therefore ensure that Knockshanvo is assessed against the **realistic cumulative development scenario**, including Oatfield and the other relevant existing, permitted and proposed wind-energy developments.



This is particularly important in relation to landscape and visual effects, Hen Harrier, noise and aviation.

The CLG remains concerned that consideration of individual project contributions can understate the significance of the wider transformation that would result from the concentration of large-scale wind energy development within this part of East Clare.

Landscape, Visual and Cumulative Effects

The Further Information does not, in the CLG's assessment, resolve the fundamental landscape issue.

The proposed development would introduce turbines of approximately **185 metres tip height**.

The Applicant relies upon the capacity of the landscape to accommodate wind-energy development and upon its assessment of individual and cumulative visual effects.

However, the relevant planning question is not simply whether wind turbines can, in principle, be accommodated within an upland landscape.

It is whether the **number, scale, distribution and cumulative concentration** of turbines proposed within this particular landscape can be accommodated without unacceptable effects upon its character, visual amenity and the experience of surrounding communities and sensitive receptors.

The cumulative relationship with Oatfield is central to that assessment.

If both developments proceed, they would not ordinarily be perceived as two separate planning projects. They would be experienced as a substantial concentration of large-scale turbines occupying the same upland area.

The CLG considers that the Further Information does not adequately overcome the concern that this would materially alter the character of the Slieve Bernagh uplands and substantially intensify the existing and emerging wind-energy landscape.



The Commission should therefore assess the development by reference to the **combined landscape that would actually result**, rather than by focusing principally upon the incremental visual contribution of Knockshanvo considered in isolation.

Biodiversity, Hen Harrier and Habitat Compensation

The Applicant has provided substantial additional ecological material and proposes mitigation, habitat enhancement and compensation measures. The CLG acknowledges the extent of this work.

Nevertheless, material concerns remain regarding **Hen Harrier, the quantification of functional habitat effects, the adequacy and certainty of habitat compensation, and the cumulative consequences of the concentration of wind-energy development within the wider East Clare uplands.**

A central issue is whether the ecological effect requiring compensation has first been adequately and conservatively identified. As addressed in detail in Response 30, the Applicant's **58.57 ha Hen Harrier habitat-loss figure** relies upon assumed complete displacement within 250 m of turbines and an operational-life average of potentially available habitat through the forestry rotation. Material uncertainty remains regarding the treatment of reduced Hen Harrier activity beyond 250 m, the applicability of displacement evidence derived from substantially smaller turbines, and the changing spatial distribution and connectivity of suitable habitat through the forestry lifecycle.

These issues become particularly important when Knockshanvo is considered cumulatively with the adjoining Oatfield proposal and other relevant wind-energy development. The assessment must address not only the quantity of suitable habitat potentially affected, but its **location, functional connectivity and availability through time**, including potential displacement, fragmentation and barrier effects.

The critical issue is therefore not simply whether habitat-management and compensation measures have been identified. The Commission should first be satisfied that the **full functional habitat effect against which those measures are dimensioned has been robustly assessed.**



It should then be satisfied that the proposed compensation and enhancement measures are:

- additional;
- appropriately located and ecologically suitable;
- of sufficient extent and quality;
- timely and secured for the necessary duration;
- capable of being implemented and maintained;
- capable of providing the ecological function attributed to them; and
- sufficient when Knockshanvo is considered cumulatively with Oatfield and other relevant development.

Where the Applicant's conclusion that significant residual or cumulative effects will not arise depends materially upon habitat enhancement or compensation, the effectiveness and sufficiency of those measures cannot simply be assumed. There must be sufficient certainty at the decision stage both as to **the effect requiring compensation and the capacity of the proposed measures to address that effect.**

The CLG therefore submits that the Commission should scrutinise both sides of the assessment: **whether the Applicant has adequately identified the full spatial, temporal and cumulative functional effect upon Hen Harrier habitat, and whether the proposed compensation and enhancement measures are sufficient and sufficiently certain to address that effect.**

Hydrology, Peatland and the Water Environment

The Applicant has undertaken extensive hydrological and hydrogeological assessment and proposes a substantial suite of drainage, sediment-control, pollution-prevention and monitoring measures.

The CLG accepts that these measures represent established approaches to wind-farm construction.

However, important uncertainty remains because the proposed development would involve substantial construction activity within an **upland peatland and commercial**



forestry environment, involving excavation, roads, turbine foundations, drainage works, forestry felling and management of excavated peat and spoil.

The environmental consequences of these activities are interconnected.

Hydrology cannot appropriately be considered independently of peat disturbance, forestry operations, designated habitats, private water supplies or downstream water quality.

Particular concern remains regarding **Gortacullin Bog NHA** and the need to ensure that changes to drainage, forestry and surrounding land use do not adversely alter the hydrological conditions upon which the designated peatland habitat depends.

The CLG also remains concerned regarding the protection of **private wells and drinking-water supplies**. Where residents depend upon private groundwater sources, the Commission should require sufficient receptor-specific understanding of groundwater pathways and a clear and enforceable response mechanism should deterioration occur.

The Applicant additionally concludes that the development will not cause deterioration in the status of relevant water bodies and will not prevent achievement of **Water Framework Directive objectives**.

That conclusion must be assessed separately from the conventional EIA finding of no significant hydrological effect.

WFD compliance requires the Commission to be satisfied that deterioration of the relevant water-body quality elements will be prevented and that the development will not compromise achievement of applicable environmental objectives.

That assessment must include the combined effects of peat excavation, drainage, sediment mobilisation, forestry activity and relevant cumulative development.

The CLG considers that the Applicant's WFD conclusion cannot simply be treated as a standalone finding independent of the underlying hydrological uncertainties identified elsewhere in the planning record.



Noise, Public Health and Residential Amenity

The Applicant's Further Information confirms that the background-noise assessment was undertaken using the established **ETSU-R-97 / Institute of Acoustics methodology**.

The CLG accepts that the use of LA90,10min is consistent with that methodology and does not contend that the noise assessment is invalid merely because this conventional parameter has been used.

However, the Applicant's own measurements demonstrate that the existing receiving environment is **exceptionally quiet at a number of locations**, particularly during night-time periods.

At several monitoring locations, derived night-time background levels at lower wind speeds are approximately **20–25 dB LA90,10min**.

This distinction is important.

A predicted turbine-noise level may comply with an applicable ETSU-derived criterion while nevertheless representing a substantial alteration to the existing acoustic environment.

Accordingly, the Commission should distinguish between:

- **compliance with a numerical noise criterion**, and
- **the magnitude and significance of the environmental change from the existing baseline**.

This is particularly important in the cumulative context.

The Applicant has appropriately modelled relevant surrounding wind farms, including Oatfield, Carrownagowan, Lackareagh, Fahybeg and Ballycar. Nevertheless, if Knockshanvo and Oatfield proceed, residents within the surrounding area would experience the combined acoustic environment created by approximately 20 large turbines within the immediate upland landscape.

The practical enforceability of cumulative operational noise limits also requires careful consideration. If several wind farms contribute simultaneously to a measured noise



level, any permission must contain a workable mechanism for determining the Knockshanvo contribution and requiring corrective action where necessary.

Sunyata Buddhist Retreat Centre

The **Sunyata Buddhist Retreat Centre** requires particular consideration.

The Applicant confirms that Sunyata was included within the noise assessment as a baseline monitoring location and noise-sensitive receptor.

The CLG therefore accepts that it was not omitted from the acoustic model.

However, the Applicant treats the Centre for noise purposes essentially as an ordinary permanent residential receptor.

This does not fully reflect the particular sensitivity of the established use.

Sunyata provides residential retreats associated with **Buddhism, meditation and mindfulness**, and the peaceful and tranquil character of its environment is integral to that function.

The Applicant predicts a worst-case cumulative turbine-noise level of approximately **38.5 dB LA90** at the Centre and relies upon compliance with the applicable numerical criterion.

The issue, however, is not simply whether the predicted level complies with a residential noise limit.

The Applicant's own baseline measurements demonstrate the existing quiet acoustic character of the location.

The Commission must therefore consider whether the cumulative alteration of that environment, together with associated visual and shadow-flicker effects, would materially affect the particular function and amenity of this unusually sensitive receptor.



Low-Frequency Noise and Infrasound

The Applicant maintains that the established scientific evidence does not demonstrate adverse health effects from wind-turbine-generated low-frequency noise or infrasound at compliant residential separation distances and that separate limits are therefore unnecessary.

The CLG does not contend that the mere presence of infrasound establishes adverse health effects.

The issue should be determined on the basis of reliable scientific evidence.

However, audible **low-frequency noise and infrasound should not be treated as identical issues**, and compliance with an overall A-weighted noise criterion does not, by itself, describe the complete frequency characteristics of turbine noise.

Given the scale of the proposed turbines, the exceptionally quiet existing acoustic environment and the cumulative concentration of turbines proposed within the Knockshanvo/Oatfield area, the Commission should be satisfied that the evidence relied upon by the Applicant is applicable to the particular turbine technology and cumulative development scenario proposed.

Aviation – A Potentially Determinative Constraint

The most significant unresolved issue arising from the Further Information concerns **aviation safeguarding**.

The Applicant has undertaken extensive additional work involving specialist aviation consultants, radar modelling, international case studies and continuing engagement with AirNav Ireland and Shannon Airport.

Notwithstanding this additional material, significant concerns remain.

However, the central conclusion arising from the CLG's assessment of the Applicant's own Further Information is that the aviation issues remain unresolved.



They principally concern two matters:

1. **Instrument Flight Procedures serving Shannon Airport; and**
2. **the Woodcock Hill Monopulse Secondary Surveillance Radar.**

These are safety-critical aviation systems and procedures.

The relevant planning test cannot therefore be whether mitigation appears possible in principle.

The Commission must have sufficient certainty that the development can actually be implemented while maintaining the required aviation safety and operational standards.

Instrument Flight Procedures

The Applicant's Further Information acknowledges that proposed Turbines **T01, T02 and T03** conflict with the existing Instrument Flight Procedure environment.

The Applicant proposes that these turbines should not be constructed until future IFP redesign measures relating to Shannon Airport are in force.

This is highly significant.

It confirms that, on the Applicant's own proposed approach, the turbines cannot presently be constructed consistently with the existing procedure environment and that their future compatibility depends upon **future redesign of aviation procedures**.

That redesign is not within the unilateral control of the Applicant.

The Applicant has expressed willingness to fund additional resources and support the redesign process. That commitment is relevant, but financial support does not establish that the necessary procedure changes will ultimately be designed, validated, approved and brought into operation in a form that accommodates the proposed turbines.

Accordingly, the IFP issue remains dependent upon a future aviation environment which does not presently exist.



Woodcock Hill Radar

The Applicant has also commissioned substantial additional technical work concerning the **Woodcock Hill MSSR**, including detailed assessments by Cyrrus and TNO.

The CLG accepts that this work demonstrates that the potential radar effects can be modelled in considerable technical detail.

However, the Applicant itself acknowledges that radar effects will occur.

The dispute concerns whether those effects are **operationally tolerable**.

This distinction is fundamental.

Demonstrating that an effect can be quantified does not establish that the affected surveillance system will continue to satisfy the required operational, safety and resilience standards.

The Applicant relies upon existing radar processing, potential optimisation, overlapping surveillance coverage and a range of possible additional mitigation measures.

However, no final Woodcock Hill mitigation scheme has been demonstrated as agreed and accepted by AirNav Ireland.

Radar Mitigation Remains Conceptual

The Further Information identifies several potential radar mitigation pathways, including:

- optimisation or upgrade of the existing Woodcock Hill MSSR;
- installation of supplementary radar;
- additional or alternative surveillance sources;
- radar-data fusion;
- Wide Area Multilateration; and
- other surveillance-system modifications.

The availability of these technologies demonstrates that engineering solutions to wind-farm/radar interaction exist internationally.



It does not establish that a particular solution has been secured for Knockshanvo.

Indeed, the Applicant's own evidence identifies important limitations.

Some proposed measures may not resolve AirNav's principal deflection concern. Other options require substantial further design and integration. AirNav has stated that at least one identified solution, Wide Area Multilateration, would not be acceptable.

The Applicant also identifies the need for further assessment by **Thales**, the radar manufacturer and Design Authority.

The CLG therefore considers that the Further Information establishes a range of **potential mitigation concepts rather than a defined and accepted Aviation Mitigation Scheme**.

International Case Studies Do Not Resolve the Knockshanvo Constraint

The Applicant relies extensively upon international examples to demonstrate that wind farms and radar systems can coexist.

The CLG accepts this general proposition.

The Applicant also provides credible evidence concerning the technical experience of TNO and the use of its PERSEUS radar-modelling methodology internationally.

However, radar mitigation is inherently **site- and system-specific**.

The relevant question is not whether a mitigation technology has worked at Schiphol, in Australia or elsewhere.

It is whether that technology will satisfactorily address the specific interaction between the proposed Knockshanvo turbines and the Woodcock Hill radar while maintaining the performance and resilience required of the Irish surveillance system.

The decisive evidence must therefore remain Knockshanvo- and Woodcock Hill-specific.



International precedent cannot substitute for a defined mitigation solution accepted by the operator of the affected aviation system.

The Ballycar Decision is Directly Relevant

The Commission's recent decision concerning **Ballycar Wind Farm** is of particular significance.

Ballycar involved aviation concerns affecting the same wider Shannon aviation environment and the Woodcock Hill radar.

The Commission was not satisfied in that case that:

“Measurable, evidence based, demonstratable and credible mitigation measures”

had been submitted which could remove the aviation risk and be agreed and implemented to the satisfaction of the relevant aviation bodies.

That reasoning provides an important and directly relevant benchmark for Knockshanvo.

The Ballycar planning record also demonstrates that the existence of **credible surveillance mitigation options** is not, by itself, sufficient.

The mitigation must be sufficiently developed to demonstrate:

- what will actually be implemented;
- how it will address the identified effect;
- whether it can be integrated into the existing aviation system;
- how it will be tested and validated;
- whether it maintains required safety and surveillance performance;
- whether the necessary third-party approvals and legal control exist; and
- whether the responsible aviation authorities accept the solution.

The Applicant has not yet demonstrated that level of certainty at Knockshanvo.



This is particularly important because the Applicant proposes that substantial elements of the aviation mitigation could be resolved through **planning conditions and subsequent agreement**.

The CLG submits that this would defer a fundamental question concerning the safe feasibility of the development.

A planning condition can appropriately regulate the detailed implementation of an aviation mitigation scheme which has already been established as technically acceptable.

It should not be used to determine after permission **whether an acceptable mitigation solution can be found at all**.

Specialist Aviation Response

Given the technical and safety-critical nature of the aviation issues raised by the proposed development, the CLG has prepared a **Specialist Aviation Response**, presented in **Section 4 of this submission**, addressing in detail the aviation matters arising from the Applicant's Further Information.

That response examines the longstanding aviation safeguarding history of the Knockshanvo/Oatfield site, including advice dating from 2008; impacts upon instrument flight procedures and the ATCSMAC; navaid flight calibration; Woodcock Hill MSSR and Shannon Primary Surveillance Radar; the Applicant's proposed radar mitigation; international case studies; the evidential basis and professional competence relied upon by the Applicant; and the deliverability of the proposed aviation-related planning conditions.

The aviation evidence demonstrates that the concerns are not new or confined to a single technical issue. The Knockshanvo/Oatfield area has been the subject of **longstanding aviation safeguarding concerns**, and the proposed development gives rise to multiple potential interactions with safety-critical aviation infrastructure and procedures serving Shannon Airport.

Of particular importance, significant elements of the Applicant's case depend upon **future technical mitigation and subsequent agreement with aviation stakeholders**. The CLG submits that matters fundamental to the aviation acceptability and



deliverability of the development should not be deferred until after permission has been granted.

The Specialist Aviation Response therefore concludes that the **Knockshanvo/Oatfield site is highly unsuitable for wind-energy development from an aviation safeguarding perspective**, given the nature, extent and combination of the aviation impacts that would arise. The Commission should be satisfied, before determining the application, that the identified impacts can be safely, technically and demonstrably resolved and that any mitigation relied upon is proven, deliverable and acceptable to the relevant aviation authorities.

Overall Executive Conclusion

The Applicant's Further Information is substantial and, in a number of areas, provides useful clarification and additional technical evidence.

The CLG has considered that material objectively and does not maintain criticisms where the Applicant has adequately addressed them.

Nevertheless, the Further Information does **not resolve a number of material environmental and planning concerns**.

In particular, uncertainty remains concerning the cumulative consequences of the concentration of large-scale wind-energy development within the Knockshanvo/Oatfield uplands; landscape and visual effects; Hen Harrier and the certainty of habitat compensation; hydrology and sensitive peatland and water receptors; and the cumulative alteration of an exceptionally quiet rural acoustic environment.

Most significantly, the Applicant has **not resolved the aviation safeguarding conflict**.

The Further Information demonstrates extensive technical investigation and identifies credible potential mitigation pathways. However, it does not provide:

- a final agreed IFP solution accommodating T01, T02 and T03;
- a final agreed Woodcock Hill radar mitigation scheme;
- confirmation that the required radar performance and resilience will be maintained;
- confirmation of AirNav Ireland's acceptance of the proposed mitigation;
- confirmation of Shannon Airport's acceptance where required;



- completed regulatory safety assurance;
- demonstrated control over all infrastructure necessary to deliver the mitigation; or
- sufficient certainty that the development as presently proposed can be implemented without material redesign.

The distinction is therefore between **possible mitigation and demonstrated mitigation**.

The Applicant has demonstrated the former.

It has not demonstrated the latter.

This distinction is particularly important having regard to the Commission's recent Ballycar decision, where credible aviation mitigation possibilities were insufficient in the absence of measurable, evidence-based, demonstrable and implementable measures capable of resolving the identified aviation risk.

The Commission must determine Knockshanvo on its own facts. However, the same fundamental planning principle applies.

Safety-critical aviation constraints should be resolved before permission is granted, rather than leaving the fundamental feasibility of the development dependent upon future technical investigation, future redesign and subsequent agreement with third parties.

When the unresolved aviation issues are considered together with the remaining concerns regarding cumulative development, landscape and visual effects, biodiversity, hydrology, water protection, noise and residential amenity, the CLG considers that the Further Information has **not provided a sufficient basis upon which the Commission can be satisfied that the proposed development is environmentally acceptable and capable of implementation in the form assessed.**

Accordingly, **East Clare Environment Protection CLG respectfully submits that the Further Information does not overcome the material concerns identified in the planning record and requests that An Coimisiún Pleanála refuse permission for the proposed Knockshanvo Wind Farm.**



3. Introduction

Purpose of this Submission

This submission is made by **East Clare Environment Protection CLG (“the CLG”)** to **An Coimisiún Pleanála (“the Commission”)** in response to the Further Information and associated Responses to Observations submitted by **FuturEnergy Ireland (“the Applicant”)** in respect of the proposed **Knockshanvo Wind Farm**.

The purpose of this submission is to assist the Commission in assessing whether the Applicant's Further Information satisfactorily resolves the material planning and environmental concerns previously raised during the application process.

This submission does not seek to repeat the entirety of the CLG's original observation. Instead, it focuses upon those Applicant responses which remain capable of materially affecting the Commission's determination of the application.

The CLG continues to rely upon its original submission and supporting documentation. Where an issue is not specifically revisited in this response, that should not be interpreted as acceptance of the Applicant's position or withdrawal of any matter previously raised.

Scope of Review

The CLG has reviewed the Applicant's Further Information as a single response package comprising:

- the principal Further Information Response to Observations;
- the associated technical appendices, including the specialist hydrology and noise responses; and
- the detailed aviation response and supporting technical material.



The CLG has considered those documents against the wider planning record, including the Knockshanvo EIAR and appendices, the CLG's original Knockshanvo submission, relevant Oatfield submissions and Further Information responses, Clare County Council's observations, prescribed body submissions, specialist hydrological evidence, aviation correspondence and the recent Ballycar Inspector's Report and Order.

The purpose of this wider comparison is not to reopen matters already adequately addressed. It is to determine whether the Further Information, when considered against the full planning record, removes the substantive concerns relevant to the Commission's decision.

Approach to the Further Information

The Applicant's Further Information is extensive and contains a mixture of:

- substantive technical responses;
- clarification of matters already contained within the EIAR;
- additional supporting evidence;
- updated planning information;
- proposed mitigation;
- responses to prescribed bodies and local authorities; and
- material that is largely explanatory or repetitive.

The CLG has concentrated only upon those responses considered capable of materially influencing the planning decision.

Accordingly, this submission does not respond line-by-line to every statement made by the Applicant.

Where the Further Information has satisfactorily addressed a matter, that issue has not been pursued further merely for the purpose of maintaining an objection.

Conversely, where the Applicant's response relies principally upon:

- future monitoring;
- adaptive management;
- post-consent technical investigation;
- future agreement with third parties;
- mitigation not yet fully designed or approved; or



- assumptions which remain contested elsewhere in the planning record,

the CLG has assessed whether sufficient certainty exists at the decision-making stage to support the conclusions advanced by the Applicant.

Structure of this Submission

The substantive body of this submission is organised by reference to the material Applicant responses identified through the CLG's review of the Further Information.

Each response is considered under the following headings:

Applicant's Response

The relevant Further Information section and page reference are identified, together with a concise summary of the Applicant's position.

Issue

The material planning, environmental or technical issue arising from that response is identified.

CLG Assessment

The Applicant's position is assessed against the wider planning record and the evidence before the Commission.

CLG Conclusion

A concise conclusion is provided as to whether the Further Information satisfactorily resolves the issue.

This structure is intended to allow the Commission to identify clearly what the Applicant has said, what remains in dispute and why the CLG considers the matter relevant to the determination of the application.



The CLG's Position on Renewable Energy Policy

The CLG recognises the importance of renewable energy development and the significant national and European policy support for the transition to a low-carbon energy system.

The CLG does not contend that wind energy development should be refused merely because it gives rise to environmental change, nor does it dispute that substantial weight must be afforded to climate and renewable energy policy.

However, policy support for renewable energy does not displace the requirement that individual projects comply with the proper planning and sustainable development of the area, environmental law, the requirements of Environmental Impact Assessment and Appropriate Assessment, and the protection of critical infrastructure and public safety.

The planning balance therefore requires more than demonstrating that a project would contribute renewable electricity generation.

The Commission must also be satisfied that the particular development proposed, at the particular location selected, can proceed without unacceptable environmental effects and without unresolved risks to other public interests.

This distinction is especially relevant in the present case because several of the outstanding issues concern not merely the weighing of environmental effects against renewable energy benefits, but whether the Applicant has demonstrated that the development is capable of safe and lawful implementation in the form proposed.

Cumulative Development Context

The proposed Knockshanvo Wind Farm must also be considered within the particular development context of the East Clare uplands.

The proposed **Oatfield Wind Farm** is located immediately adjoining the Knockshanvo area, while a number of other existing, permitted and proposed wind energy developments occur within the wider landscape.



The CLG acknowledges that Knockshanvo and Oatfield are separate planning applications and are promoted by separate development interests.

However, environmental effects do not occur according to planning application boundaries.

Where the same landscape, ecological receptors, hydrological catchments, communities, roads, acoustic environment or aviation infrastructure are affected by more than one project, the Commission must consider the resulting cumulative environment.

This is especially important in relation to:

- landscape and visual effects;
- Hen Harrier and habitat availability;
- hydrology and peatland;
- noise;
- roads and infrastructure; and
- aviation.

The CLG's assessment therefore places particular emphasis on whether the Applicant's Further Information adequately reflects the **combined development scenario that may reasonably arise**, rather than considering Knockshanvo only as an isolated nine-turbine project.

Importance of Mitigation Certainty

A recurring feature of the Further Information is reliance upon mitigation measures intended to reduce or avoid predicted effects.

The CLG accepts that mitigation is a legitimate and necessary component of environmental assessment and that many impacts can be satisfactorily addressed through well-designed and enforceable measures.

However, where the Applicant's conclusion of no significant effect depends materially upon mitigation, the Commission must be satisfied that the mitigation is:

- sufficiently defined;
- technically feasible;



- capable of implementation;
- legally and practically secured;
- effective within the required timeframe;
- enforceable; and
- not dependent upon unresolved future agreement on a matter fundamental to the acceptability of the development.

This distinction is particularly important where mitigation is proposed through future habitat creation, long-term management, construction-stage adaptive measures or changes to third-party aviation infrastructure and procedures.

Monitoring may verify whether mitigation is working. It does not, by itself, establish that the underlying measure will be effective.

Likewise, a commitment to enter future discussions with a third party is not equivalent to an agreed and deliverable mitigation scheme.

The CLG has therefore assessed the Applicant's mitigation proposals not merely by reference to whether a potential solution has been identified, but whether the evidence before the Commission provides sufficient certainty that the solution can actually be delivered.

Aviation as a Distinct Planning Constraint

The aviation issues require particular care because they concern safety-critical infrastructure and procedures associated with **Shannon Airport and AirNav Ireland**.

The CLG recognises that technical solutions to wind farm and aviation interactions can exist and does not contend that any aviation interaction automatically requires refusal.

However, the Commission must distinguish between:

- a technical mitigation concept;
- a technically developed mitigation proposal; and
- an agreed, validated and implementable solution accepted by the body responsible for the affected aviation system.

The Applicant's Further Information advances substantial additional technical evidence, including radar modelling, proposed mitigation options and international case studies.



The central issue is whether that material has progressed sufficiently to demonstrate that the aviation constraint is actually resolved.

The recent **Ballycar Wind Farm decision** is directly relevant in this respect. It demonstrates the importance placed by the Commission upon measurable, evidence-based and demonstrable aviation mitigation and upon resolving fundamental aviation issues before permission rather than leaving them to future agreement.

The CLG addresses these matters in detail in the aviation responses later in this submission.

Overall Position

The CLG has approached the Further Information on the basis that additional evidence should be assessed objectively and that issues should not be maintained where the Applicant has satisfactorily addressed them.

Nevertheless, following review of the material Further Information responses against the wider planning record, the CLG considers that significant matters remain unresolved.

These include, in particular:

- cumulative and piecemeal development within the Knockshanvo/Oatfield uplands;
- landscape and visual effects;
- Hen Harrier and the adequacy of compensation and enhancement measures;
- hydrology, peatland, Gortacullin Bog NHA and Water Framework Directive compliance;
- cumulative operational noise and sensitive receptors; and
- aviation safeguarding, including Instrument Flight Procedures and Woodcock Hill radar.

For the reasons set out in the substantive responses that follow, the CLG considers that the Further Information does not provide a sufficient basis upon which the Commission can be satisfied that the proposed development is environmentally acceptable and capable of implementation without unresolved material risk.

The CLG therefore maintains its request that **permission for the proposed Knockshanvo Wind Farm be refused**.



4. Specialist Aviation Response

Executive Summary

The aviation issues associated with the proposed Knockshanvo Wind Farm remain substantial and unresolved. They concern not simply the operation of Shannon Airport, but also Instrument Flight Procedures, air traffic control operations, navigation-aid flight inspection, the Shannon Primary Surveillance Radar and the Woodcock Hill en-route Monopulse Secondary Surveillance Radar (“MSSR”), which forms part of the State's air traffic surveillance infrastructure.

The cumulative aviation evidence also raises a more fundamental site-suitability concern. The Knockshanvo/Oatfield area is an inherently constrained location for development of this scale, given its proximity to Shannon Airport, its interaction with existing Instrument Flight Procedures and its direct effect on the Woodcock Hill surveillance radar. The scale, number and location of the proposed turbines create aviation impacts which are not incidental or readily avoidable, but arise from the underlying relationship between the site and safety-critical aviation infrastructure. In the CLG's view, this strongly indicates that the Knockshanvo/Oatfield area is a highly unsuitable location for wind farm development of the scale now proposed.

Having reviewed the Applicant's Further Information, the CLG's principal aviation concerns are as follows.

1. AirNav's request for comparable operational evidence has not been met

AirNav Ireland sought evidence of an operational wind farm situated at a comparable distance from an **en-route MSSR** performing a similar function to Woodcock Hill, and demonstrating that turbines of comparable scale can operate without unacceptable surveillance effects.



The Applicant has submitted a number of international and domestic case studies. However, none demonstrates an operational situation directly comparable to Woodcock Hill, with turbines of the proposed scale and proximity and an en-route MSSR operating over a range of approximately 256 nautical miles.

Accordingly, the specific real-world evidence sought by AirNav has not been provided.

2. Material radar effects remain identified

The Applicant's own technical material and the evidence of AirNav identify effects including:

- radar beam deflection/Off-Boresight Error (“OBE”);
- reflections;
- radar shadowing; and
- potential degradation of surveillance performance.

The TNO assessment itself predicts OBE effects when Knockshanvo is introduced, with further cumulative effects when Oatfield is added.

AirNav's position is particularly important: it has stated that, in its opinion, there is **no credible mitigation for the Woodcock Hill MSSR beam-deflection issue**, and that turbine shadowing would introduce coverage gaps in controlled airspace and degrade probability of detection.

The Shannon Primary Surveillance Radar is a separate system and is also acknowledged to be potentially affected by turbine clutter. The Applicant discusses substantial technical interventions, but a final agreed and demonstrated solution is not presently before the Commission.

3. The aviation system should not be made less safe

AirNav's safety-management framework requires changes to its functional systems not to result in a system that is less safe than the existing configuration.

That principle is fundamental to consideration of Knockshanvo.

The relevant question is therefore not simply whether a theoretical technical modification can be devised, but whether an accepted, implementable and regulatorily approved solution has been demonstrated which preserves the existing level of aviation safety and operational functionality.



The evidence presently before the Commission does not demonstrate that this has been achieved.

4. Instrument Flight Procedure impacts remain

The Applicant's aviation material identifies effects upon a number of procedures or protected areas associated with Shannon Airport, including:

- SID RWY 06 DIGAN 3A;
- SID RWY 06 TOMTO 3A;
- SID RWY 06 ABAGU 3A;
- Instrument Approach VOR RWY 24; and
- the ATC Surveillance Minimum Altitude Chart (“ATCSMAC”).

The ATCSMAC issue is particularly important because it concerns the flexibility available to Air Traffic Control when vectoring, sequencing and separating aircraft for approach to Shannon Airport.

5. PBN does not remove all aviation constraints

The Applicant places significant reliance upon the future implementation of Performance Based Navigation (“PBN”).

However:

- PBN concerns navigation and does not eliminate the separate requirement for radar surveillance;
- conventional ground-based navigation aids are being retained as part of aviation resilience arrangements because of increasing concern regarding GNSS interference, jamming and spoofing; and
- the timing and precise consequences of future PBN implementation should not be treated as certain.

PBN therefore cannot be relied upon as a general solution to the aviation effects identified at Knockshanvo.

6. Evidential reliability and professional status require clarification

The original EIAR described Cyrrus as an IAA-approved procedure design organisation.

The IAA confirmed in writing that:

“CYRRUS Ltd are NOT an IAA approved procedure design organisation (APDO)”



and do not hold the stated EASA accreditation.

A further professional-status issue arises in relation to the assessment and proposed mitigation of impacts on operational ATC radar systems. Neither AI Bridges nor Cyrrus has demonstrated that the personnel undertaking this work hold the relevant EUATSEP (Air Traffic Safety Electronics Personnel) qualifications or authorisations applicable to safety-related ATC surveillance systems. This is material given the Applicant's reliance on their conclusions regarding radar impacts and mitigation. The Commission should therefore distinguish between general radar consultancy expertise and the specific competence and authorisation required for safety-critical ATC systems.

This does not mean that all technical evidence submitted by Cyrrus should automatically be disregarded. It does, however, mean that the record should be corrected and that the Commission should consider the appropriate weight to be attached to technical opinions concerning matters which ultimately require approval from AirNav and the IAA.

7. The Knockshanvo meteorological mast provides relevant safeguarding history

An approximately 80 m meteorological mast associated with the Knockshanvo site was erected in 2023 without the aviation notification and safeguarding measures identified by AirNav as necessary.

While the Applicant has stated that the mast was erected in November 2023, photographic evidence submitted by the CLG shows that it was already in place by 19 October 2023.

The mast was subsequently the subject of a retention application to Clare County Council. That retention proposal is now before An Coimisiún Pleanála on appeal under Case Reference PL03.501457, lodged on 2 June 2026, and remains undetermined. ACP describes the case as retention of the existing 80 m lattice-type meteorological mast and associated instruments for a period of two years.

AirNav described the mast as representing a:

“serious and unacceptable danger to low flying aircraft”

and stated that its presence significantly increased collision risk.



The mast history is relevant because it demonstrates that an aviation obstacle associated with the Knockshanvo project was erected and remained in place without the aviation notification, charting and lighting safeguards subsequently identified by AirNav as necessary. The fact that the retention of that mast is itself currently before the Commission further reinforces the relevance of this safeguarding history to the Commission's assessment of the wider Knockshanvo proposal.

8. Reliance upon unagreed meeting minutes should be treated cautiously

The Applicant relies upon records of meetings with AirNav.

In the related Oatfield process, AirNav expressly stated that meeting minutes submitted as part of the Further Information had not been circulated to it for review or agreement before submission.

Where the Knockshanvo conclusions depend materially upon interpretation of discussions with AirNav, the Commission should distinguish carefully between agreed positions of AirNav and records prepared by the Applicant or its consultants.

9. The proposed aviation planning conditions do not resolve the underlying uncertainty

The Applicant proposes, in substance, that:

- turbines T01, T02 and T03 should not be constructed until relevant PBN changes are in force; and
- development should not proceed until outstanding aviation matters have been resolved to the satisfaction of AirNav and other relevant aviation bodies.

The CLG considers that such conditions would risk deferring the fundamental issue of **whether an acceptable and deliverable aviation solution actually exists.**

A condition may appropriately regulate the detailed implementation of a mitigation measure whose feasibility has already been demonstrated. It should not substitute for demonstrating before consent that essential mitigation dependent upon future procedure redesign, infrastructure alteration, regulatory approval or third-party agreement is actually capable of being delivered.

10. Navaid flight-calibration effects have not been adequately demonstrated for the actual combined development



The aviation report raises a further issue concerning flight inspection and calibration of the ground-based navigation aids serving Shannon Airport.

The assessment relied upon for Knockshanvo appears to draw materially upon work undertaken for the earlier Violet Hill proposal rather than a complete assessment of the present Knockshanvo and Oatfield configurations.

Given that navigation aids such as ILS and VOR must continue to meet regulatory flight-inspection requirements, the Commission should be satisfied that the actual developments presently proposed will not interfere with the ability to perform those required calibration flights.

This matter should not be left dependent upon an unapproved future modification of flight-inspection procedures.

Aviation Safeguarding History

1. 2008 aviation advice

The aviation safeguarding concerns associated with the Knockshanvo/Oatfield area are not recent and did not arise only in response to the current proposals. **As far back as 2008, AirNav Ireland and the Irish Aviation Authority identified this area as unsuitable for wind farm development because of its interaction with safety-critical aviation infrastructure and operations serving Shannon Airport.**

This is important context for the Commission. The aviation difficulties now identified in relation to Knockshanvo and Oatfield are not unforeseen technical issues arising from a particular turbine design. They reflect a **long-established constraint inherent in the location of the sites themselves.**

Despite advances in turbine and radar technology and repeated consideration of potential mitigation since 2008, the fundamental safeguarding concerns have persisted. The current proposals continue to give rise to effects on Instrument Flight Procedures, the Woodcock Hill MSSR and Shannon Airport surveillance infrastructure, with AirNav continuing to identify unresolved safety and operational concerns.

The Commission should therefore recognise that the aviation authorities have consistently identified the Knockshanvo/Oatfield area as unsuitable for wind farm development since 2008. The present aviation difficulties are the continuation of a



long-established site constraint, rather than matters that can be assumed to be resolved through future mitigation.

2. Brookfield proposal

A later wind energy proposal associated with Brookfield Renewables was explored in approximately 2015.

The aviation report records that the project did not proceed to a planning application following identification of aviation constraints.

Again, the CLG does not contend that the outcome of an earlier design automatically precludes a later proposal.

The relevance is that aviation safeguarding has consistently influenced the development potential of this upland area.

3. Violet Hill

The later Violet Hill proposal involved approximately 18 turbines across the wider area subsequently divided between the present Knockshanvo and Oatfield projects.

Extensive engagement concerning aviation impacts occurred in relation to that proposal.

Violet Hill did not proceed as submitted.

The present Knockshanvo project comprises nine turbines, while the adjoining Oatfield proposal comprises eleven turbines. For aviation purposes, it is therefore essential that the effects of the two projects are considered cumulatively where both interact with the same radar, navigation and flight-procedure systems.

The reduction in turbine numbers within the Knockshanvo application cannot, by itself, be treated as resolving the aviation problem where a further eleven turbines are proposed immediately adjoining it.

4. Knockshanvo and Oatfield

The present position is therefore unusual.

Two separate applications now encompass approximately 20 turbines within broadly the same area previously examined under Violet Hill.



This is especially important in relation to:

- Woodcock Hill MSSR;
- Shannon PSR;
- radar shadowing;
- radar deflection;
- flight procedures;
- navigation-aid calibration; and
- the cumulative sector of surveillance potentially affected.

The aviation effects should therefore be considered on the basis of the **actual foreseeable combined development environment**, not simply by comparing nine Knockshanvo turbines with an earlier 18-turbine project.

5. Meteorological mast

The aviation safeguarding history also includes the approximately 80 m meteorological mast erected at Knockshanvo in 2023.

AirNav subsequently objected to its retention and stated that the mast had not been demonstrated to comply with the relevant obstacle-notification requirements, was unlit and was not appropriately represented in aviation obstacle information.

AirNav described the mast as presenting a:

“serious and unacceptable danger to low flying aircraft”

particularly helicopters and fixed-wing aircraft undertaking lawful low-level operations.

AirNav also stated that its presence significantly increased collision risk with potentially catastrophic consequences.

The CLG does not rely upon this history as proof that the wind farm itself would be unsafe.

Its relevance is narrower: it demonstrates the importance of strict aviation safeguarding in this location and that a project-related obstacle existed without the aviation notification and mitigation measures subsequently identified by AirNav as necessary.



Instrument Flight Procedures and ATCSMAC

1. Identified Instrument Flight Procedure impacts

The Applicant's aviation assessment identifies effects upon a number of procedures associated with Shannon Airport, including:

- SID RWY 06 DIGAN 3A;
- SID RWY 06 TOMTO 3A;
- SID RWY 06 ABAGU 3A;
- Instrument Approach VOR RWY 24; and
- the ATCSMAC.

These are not abstract mapping constraints.

Standard Instrument Departures establish protected routing and obstacle-clearance requirements for aircraft leaving an airport. The proposed turbines are both tall structures and located on elevated ground, making obstacle-clearance considerations particularly important.

The Applicant has examined possible procedural changes. However, any revised procedure must ultimately pass the appropriate design, safety-assurance and regulatory processes.

The fact that a theoretical redesign can be modelled does not mean that it has been operationally accepted.

2. ATCSMAC

The ATC Surveillance Minimum Altitude Chart is particularly important because it informs the minimum altitudes available to controllers when radar-vectoring aircraft.

The aviation material records AirNav/IAA concerns that changes to the ATCSMAC would:

- reduce flexibility in vectoring aircraft;
- affect short-final sequencing;
- increase controller workload; and
- create operational concerns associated with approach management.



The Applicant's own consultant subsequently concluded that:

“The Wind Farm will still have an impact on the ATCSMAC.”

The report further states that while redesign options may allow safe vectoring in a technical sense, Shannon Airport and the IAA would have to determine whether the resulting arrangements remain operationally acceptable.

That distinction is important.

The question is not only whether a diagram can be redesigned to satisfy obstacle-clearance criteria.

It is whether the resulting airspace remains capable of supporting the safe and efficient operation of Shannon Airport and the workload and flexibility requirements of Air Traffic Control.

3. Performance Based Navigation

The Applicant places significant reliance upon the future PBN programme.

The CLG accepts that PBN is an important part of the modernisation of aviation navigation.

However, three points need to be distinguished.

First, **navigation and surveillance are different functions.**

PBN may alter how aircraft navigate along instrument procedures, but it does not eliminate the requirement for AirNav to maintain an effective surveillance picture by utilising its radars.

Accordingly, PBN does not resolve the separate Woodcock Hill MSSR, Shannon PSR shadowing and deflection issues.

Second, ground-based navigation infrastructure is not simply disappearing.

Recent evidence indicates that conventional ground-based systems are being retained as part of a resilience strategy because of increasing GNSS jamming and spoofing concerns.



The aviation report reproduces recent evidence that the IAA is reviewing the pace at which conventional systems are withdrawn and retaining them as contingency infrastructure.

Third, the exact timing and content of future PBN changes therefore cannot reasonably be treated as guaranteed.

The Applicant's statement that it believes the relevant impacts will no longer arise following PBN implementation in 2030 should therefore be treated as a future assumption rather than an existing mitigation solution.

4. Implications of future procedure redesign

Where a development requires existing flight procedures to be redesigned in order to accommodate turbines, the Commission should distinguish between:

- a procedure already approved and available for implementation; and
- a possible future redesign still requiring detailed design, operational acceptance, safety assessment and regulatory approval.

The present evidence falls substantially into the latter category.

The CLG does not say that procedure changes are impossible.

It submits that the planning decision should not assume that such changes will necessarily be approved in the form or timeframe required by the development.

5. Proposed condition concerning T01, T02 and T03

The Applicant has proposed that turbines T01, T02 and T03 could be prevented from construction until relevant PBN changes have been implemented.

The CLG considers that this proposal illustrates the unresolved nature of the present application.

Three turbines cannot presently be accommodated without reliance upon a future change to the aviation environment.

The Commission should therefore consider whether it is appropriate to grant permission for those turbines now where:

- the relevant future procedure does not yet exist in approved form;
- the implementation timetable may change;



- conventional navigation infrastructure is being retained for resilience reasons; and
- PBN does not full mitigate the stated IFP impacts,
- PBN does not in any event resolve the separate radar-surveillance constraints.

The appropriate question is not whether a condition can be drafted.

It is whether the Commission presently has sufficient evidence to conclude that the turbines can be safely and lawfully accommodated.

Navaid Flight Calibration

Navigation aids serving Shannon Airport require periodic flight inspection and calibration in accordance with the applicable aviation standards.

These checks are undertaken using specialist aircraft which fly prescribed profiles to verify that navigation signals remain accurate and within operational tolerances.

The aviation report raises an important concern that the actual Knockshanvo and Oatfield configurations have not been subject to a complete, project-specific assessment of their effects upon those calibration profiles.

Instead, the Knockshanvo assessment appears to rely materially upon work undertaken for the earlier Violet Hill proposal, while material concerning Oatfield has relied upon other previous assessments.

The fact that an earlier project contained a greater or different number of turbines does not necessarily establish the flight-calibration effects of the present cumulative configuration.

The current planning decision concerns:

- nine Knockshanvo turbines; and
- eleven adjoining Oatfield turbines.

The relevant assessment should therefore address those actual developments.

The report further identifies potential conflict with existing flight-inspection profiles and refers to a suggested mitigation involving operation at increased altitude.



Such a modification cannot simply be assumed to be technically or regulatorily acceptable.

Calibration flights are intended to verify the performance of navigation signals within a prescribed operational environment. A revised profile must therefore be shown to satisfy the relevant regulatory and technical requirements rather than merely avoiding physical obstacles.

This issue has potentially serious consequences.

If a navigation aid cannot successfully complete its required regulatory flight inspection, continued operational use could be affected until compliance is demonstrated.

Given Shannon Airport's role in scheduled aviation and as an important diversionary airport for transatlantic traffic, the Commission should require a high level of certainty on this matter.

Accordingly, before permission could be granted, the CLG submits that the Commission should be satisfied that:

1. the actual Knockshanvo proposal has been assessed;
2. the cumulative Knockshanvo/Oatfield configuration has been assessed where relevant;
3. all affected flight-inspection profiles have been identified;
4. any modified inspection methodology has been demonstrated to be technically viable;
5. the relevant aviation bodies accept that approach; and
6. continued regulatory availability of the affected navigation aids will not be compromised.

At present, that certainty has not been demonstrated.

Woodcock Hill MSSR

1. Importance of the radar

Woodcock Hill is an en-route Monopulse Secondary Surveillance Radar forming part of AirNav's national air traffic surveillance infrastructure.



The proposed Knockshanvo turbines are approximately 5.6 km or more from the radar, with the Oatfield turbines occupying the same wider radar sector.

The aviation evidence identifies three principal categories of potential effect:

- shadowing;
- reflections; and
- radar beam deflection/Off-Boresight Error.

2. Line of sight

The TNO assessment confirms full line of sight between Woodcock Hill and the proposed turbines.

Line of sight does not by itself establish that unacceptable effects will occur, but it establishes that the turbines are positioned so that interaction with the radar signal must be assessed.

TNO subsequently proceeds to quantify OBE effects, confirming that the analysis is not merely theoretical screening.

3. Radar shadowing

Radar shadowing occurs where an obstacle degrades the radar's ability to detect targets beyond it.

AirNav has specifically identified shadowing as an unresolved concern.

Its evidence states that where turbines are at or above the radar's elevation, the resulting effect may extend substantially beyond the immediate turbine location.

AirNav's position in relation to the adjoining Oatfield proposal is particularly relevant because it states:

“The shadowing effect of the Turbines will introduce coverage gaps in controlled airspace...”

and that this would result in a change to the surveillance functional system and degradation in probability of detection.

Given the co-location of Knockshanvo and Oatfield in the same surveillance environment, the cumulative effect requires explicit consideration.



The Applicant's consultants have suggested that shadowing will not constitute a significant operational problem and that optimisation may be available if required.

However, the CLG considers that the Commission should attach considerable weight to AirNav's assessment because AirNav operates the affected surveillance system and is responsible for maintaining its safety performance.

4. Reflections

Radar signals can also interact with turbine structures through multipath reflection.

The issue is not simply whether the radar detects the turbine.

Reflected signals can affect the apparent bearing or position of aircraft returns and contribute to anomalous surveillance tracks.

AirNav has identified radar reflections as part of its broader concern regarding turbines in proximity to Woodcock Hill.

5. Deflection and Off-Boresight Error

The most significant technical issue appears to concern beam deflection and OBE.

In simple terms, an obstacle between the radar and aircraft can alter the apparent bearing of an aircraft return.

The consequence is that the position displayed to the controller may differ from the aircraft's actual position.

The TNO assessment itself predicts OBE associated with Knockshanvo and a further cumulative expansion when Oatfield is added.

The report records TNO as identifying an additional affected azimuth sector arising from Knockshanvo and a broader sector following inclusion of Oatfield.

This is therefore not a case where the Applicant's own modelling finds no effect.

The issue is whether the resulting effect is operationally acceptable and capable of mitigation. AirNav are on record stating that there is no mitigation possible for the radar deflection issue.

6. AirNav measured evidence



AirNav has provided real-world evidence concerning beam deflection associated with an existing telecommunications mast in the Woodcock Hill environment.

The aviation report records an example involving an aircraft at substantial range where the observed plot displacement was approximately 1.63 nautical miles.

AirNav explains that such effects can generate:

- duplicate tracks;
- Short Term Conflict Alert warnings;
- duplicate alerts; and
- workload for controllers attempting to distinguish genuine traffic conflicts from anomalous returns.

This empirical evidence is particularly relevant because it demonstrates that deflection is not merely a theoretical modelling concern in this terrain and radar environment.

7. TNO findings

TNO's Knockshanvo assessment models OBE effects from the proposed turbines.

The aviation report records modelled positional errors reaching approximately:

- 2,038 m at around 150 nautical miles; and
- approximately 3,474 m at 256 nautical miles,

depending upon the modelling parameters and target altitude.

The CLG considers these figures material because they demonstrate significant predicted positional deviation rather than an effect approaching zero.

The correct interpretation and operational acceptability of those figures are matters for AirNav and the aviation regulator.

AirNav's stated position is that the deflection issue cannot, in its opinion, be mitigated.

That unresolved disagreement is fundamental to the planning decision.

8. Tooman overlap

TNO refers to the potential availability of coverage from another MSSR, including Tooman.



Overlapping surveillance can, in principle, contribute to system resilience.

However, the CLG considers that important questions remain.

In particular:

- whether equivalent coverage exists throughout the affected airspace;
- whether adequate coverage exists below 5,000 ft;
- how the system would operate when the supplementary radar is unavailable for maintenance;
- whether relying upon supplementary coverage changes the safety architecture of the functional system; and
- whether AirNav accepts that arrangement.

It would not be sufficient to demonstrate overlapping coverage at selected altitudes if gaps remain in controlled airspace relevant to normal ATC operations.

9. AirNav's position

AirNav has stated in relation to the same surveillance environment:

“The issue of radar deflections cannot be mitigated in our opinion.”

and:

“The AirNav Change management systems approved by the IAA does not allow for functional system changes that result in a less safe system than the original system scenario.”

Those statements go to the heart of the aviation issue.

Unless and until AirNav is satisfied that an accepted mitigation exists, the Applicant's conceptual alternatives cannot reasonably be treated as equivalent to a demonstrated solution.

Shannon Primary Surveillance Radar

The Shannon Primary Surveillance Radar is separate from the Woodcock Hill MSSR and requires separate consideration.



The proposed turbines are within radar line of sight and the Applicant accepts that potential turbine clutter requires assessment.

The Applicant's technical material discusses possible measures ranging from optimisation to significant software or hardware intervention.

However, the evidence does not presently identify a single agreed solution demonstrating that:

- the required radar performance will be preserved;
- downtime can be managed without unacceptable operational consequences;
- any required upgrade is technically compatible with the existing system;
- AirNav accepts the proposed solution; and
- the solution has completed the necessary safety and regulatory processes.

The Applicant refers to the possibility that a major upgrade may not ultimately prove necessary.

At the same time, its material discusses substantial modifications if interference cannot otherwise be satisfactorily managed.

That position demonstrates remaining uncertainty regarding both the magnitude of the effect and the eventual technical remedy.

The ACP-commissioned Sagentia evidence considered in the Ballycar process is also relevant. It describes limitations associated with the STAR 2000 system and notes that a substantial upgrade may involve replacement of much of the system electronics and potentially significant downtime.

The CLG does not suggest that a radar upgrade is technically impossible.

The issue is whether the Commission can presently rely upon an **unselected and unapproved future upgrade pathway** as mitigation for a development whose interference effects are already acknowledged.

In the CLG's view, the answer should be no unless the necessary solution is established and accepted before permission is granted.



Proposed Radar Mitigation

The Applicant identifies a number of potential mitigation pathways for the Woodcock Hill MSSR.

These include:

1. modification or upgrade of the existing MSSR;
2. a supplementary short-range MSSR;
3. a supplementary long-range MSSR; and
4. Wide Area Multilateration or related surveillance alternatives.

The CLG does not suggest that these technologies are inherently incapable of performing aviation surveillance functions.

The difficulty is that none has been demonstrated in the present application as an **agreed, designed, approved and deliverable solution to the Knockshanvo impacts.**

Existing MSSR modifications

The evidence indicates that AirNav does not consider changes to the existing Woodcock Hill system capable of resolving the beam-deflection issue to its satisfaction.

That carries significant weight given that AirNav operates the system.

Supplementary radar

A proposal for an additional radar introduces substantial further questions:

- site selection;
- land acquisition;
- planning permission;
- system procurement;
- integration;
- communications infrastructure;
- testing;
- certification;
- safety assessment;
- regulatory acceptance;
- capital and operational responsibility; and
- continuing maintenance.



None of those issues is necessarily insurmountable.

But they demonstrate why the mere identification of “supplementary radar” as an option is not equivalent to an available mitigation measure.

Wide Area Multilateration

The report records that this option has not been accepted by AirNav as an adequate solution and is not being pursued as the principal mitigation.

Overall position on radar mitigation

The Commission therefore faces a clear distinction between:

possible technical concepts

and

a demonstrated mitigation solution capable of being relied upon in the planning decision.

At present, the Applicant has identified possible pathways but has not demonstrated an accepted final solution.

Where the affected infrastructure is safety-critical national aviation infrastructure, the CLG considers that this uncertainty cannot appropriately be deferred until after permission has been granted.

International Case Studies

1. Newcastle

The Applicant refers to Newcastle Airport as evidence that radar effects associated with wind turbines can be mitigated.

However, evidence considered by Sagentia in the Ballycar process indicates that the Newcastle example differs materially from the circumstances at Woodcock Hill and Shannon.



In particular, the report records that the STAR 2000 at Newcastle provides limited wind-farm mitigation and that operational procedures remain necessary to manage degraded performance.

Accordingly, Newcastle does not demonstrate that turbines can operate at the proposed proximity to an en-route MSSR such as Woodcock Hill and the Shannon PSR with no material surveillance effects.

2. Schiphol

The Applicant also relies upon experience associated with Schiphol.

The CLG accepts that radar systems within major European aviation environments demonstrate that technically complex surveillance architectures can be developed.

However, the relevant question is not whether wind turbines exist somewhere within an airport's broader surveillance environment.

It is whether the technical, operational and regulatory circumstances are sufficiently comparable to demonstrate that the specific Woodcock Hill effects can be safely mitigated.

AirNav itself has stated in relation to such comparisons that the referenced UK and European developments involve **different applications of radar services**.

The CLG therefore considers that the Schiphol material does not provide the directly comparable in-service evidence sought by AirNav.

3. Boolnaglegagh

The Boolnaglegagh Wind Farm in West Clare is also referenced.

That development comprises smaller turbines and is approximately 15.5 km from the relevant radar infrastructure.

The proposed Knockshanvo and Oatfield turbines are substantially closer to Woodcock Hill.

The significance of Boolnaglegagh is therefore limited.

Indeed, its existence demonstrates that AirNav does not object to all wind energy development within radar consultation areas.



Where it has been satisfied that an individual development can be accommodated, projects have proceeded.

This strengthens rather than weakens the significance of AirNav's continuing objection to the much closer Knockshanvo/Oatfield development.

4. Australian example

The Australian case study is potentially the most relevant of the international examples because it involved TNO analysis of wind turbines and MSSR effects.

However, the full context is important.

The aviation report records that Airservices Australia identified unacceptable impacts associated with the proposed turbines, including:

- aircraft track drop-outs;
- false tracks;
- positional errors; and
- operational consequences.

Airservices Australia also expressly disagreed with the TNO suggestion that aircraft track “weaving” or positional error becomes unimportant in en-route airspace, noting that accurate aircraft position remains important throughout flight because controllers may be applying minimum separation at any time.

The eventual project outcome also appears to have involved removal or relocation of turbines considered most problematic.

Accordingly, the Australian case does not establish the proposition that overlapping MSSR coverage automatically mitigates significant turbine-induced positional error.

To the contrary, it demonstrates that an ANSP may require substantial redesign of the wind farm itself where surveillance effects are unacceptable.



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majorprojects.planningportal.nsw.gov.au



3, 9, 10, 15, 20 and the tight groupings of wind turbines (in azimuth as seen from Mount Bobbara Radar) from just after wind turbine 20 through to approximately 220°.

It is important to note the statement made in the *TNO Report's* conclusion: "... For example, for well separated aircraft 'en route', the weaving motion of the track is likely to be completely unimportant. In case the separation is less, e.g. for aircraft that are approaching the Albury ILS glide path towards the runway, the error can be dangerous, as an ATC operator is misinformed because of the weaving motion. ...". Airservices does not agree that the first scenario mentioned leads to a "completely unimportant" outcome. The accuracy of display of the aircraft position is important during all phases of flight, as at any time a controller may be separating aircraft to the minimum allowable standards. In addition, although a potential mitigation was suggested (ie, the Secondary Surveillance Radar at Mount Macedon), this was not investigated in the report and there is no evidence provided to support this as a potential solution. Nonetheless, anything (ie, the current Yass Valley Wind Farm proposal) that could result in an error that is considered "dangerous" to aircraft operations and air navigation management, will not be accepted by Airservices (and presumably CASA).

Figure 1: TNO inappropriate suggestion that Track Wander is unimportant in enroute route airspace.

5. Overall conclusion on case studies

The CLG does not contend that international case studies have no evidential value.

They demonstrate that wind-farm/radar interactions can sometimes be addressed through:

- turbine relocation;
- turbine removal;
- radar upgrade;
- supplementary surveillance;
- altered operational procedures; or
- combinations of measures.

However, they do **not** establish that any of those measures provide an accepted and equivalent solution for Knockshanvo.

AirNav specifically sought comparable operational evidence.

That request remains unmet.



Applicant's Aviation Consultants and Evidential Reliability

This issue should be addressed factually rather than by questioning the motives of any consultant.

1. Cyrrus accreditation discrepancy

The original aviation material described Cyrrus as an IAA-approved procedure-design organisation.

The IAA subsequently confirmed in writing:

“CYRRUS Ltd are NOT an IAA approved procedure design organisation (APDO)”

and further confirmed that Cyrrus did not hold the identified EASA Part FPD accreditation.

A further professional-status issue arises in relation to the assessment and proposed mitigation of impacts on operational ATC radar systems. Neither Al Bridges nor Cyrrus has demonstrated that the personnel undertaking this work hold the relevant EUATSEP (Air Traffic Safety Electronics Personnel) qualifications or authorisations applicable to safety-related ATC surveillance systems. This is material given the Applicant's reliance on their conclusions regarding radar impacts and mitigation. The Commission should therefore distinguish between general radar consultancy expertise and the specific competence and authorisation required for safety-critical ATC systems.

The Commission should therefore ensure that the original description is corrected and should assess the technical evidence on the basis of the organisation's actual status.

This does not mean Cyrrus is prevented from providing technical advice.

It does mean that any implication that the organisation's conclusions themselves carry IAA procedural approval should be avoided.

2. Meeting minutes

The Applicant relies upon minutes or notes of meetings with AirNav when interpreting AirNav's position.



In the related Oatfield process, AirNav stated:

“The meeting minutes furnished in the RFI were not distributed for review or to be agreed with AirNav Ireland, prior to submission as part of the RFI process.”

The Commission should therefore distinguish between:

- an agreed position formally expressed by AirNav; and
- an Applicant's or consultant's record or interpretation of discussions.

Where there is a conflict, formal written correspondence from AirNav should be given greater evidential weight in establishing AirNav's actual position.

3. Changed or inconsistent conclusions

The report identifies examples where the Applicant's aviation consultants have changed or qualified previous conclusions.

One example concerns the ILS Runway 06 procedure in the Oatfield material, where later assessment identified an effect that was not identified in the earlier assessment.

Technical assessments can legitimately evolve when additional information becomes available.

However, where a later assessment materially changes an earlier conclusion concerning aviation safety, the Commission should examine:

- why the effect was not previously identified;
- whether the same methodology has been used elsewhere;
- whether other effects may require reconsideration; and
- whether the updated assessment is now complete.

4. Appropriate evidential weight

The CLG does not contend that consultants appointed by an Applicant should be disregarded merely because they are retained by the developer.

The relevant distinction is institutional responsibility.

AirNav operates the affected surveillance infrastructure and is responsible for the safe and efficient provision of air-navigation services.

The IAA performs the relevant regulatory functions.



Shannon Airport operates the affected airport.

Accordingly, where a consultant's view concerning operational acceptability conflicts with the formal position of the body that must actually operate and safety-assure the system, the Commission should require particularly compelling evidence before concluding that the statutory operator's concerns can be overridden.

Proposed Planning Conditions and Deliverability

The Applicant proposes conditions intended to address unresolved aviation matters.

These include:

- postponing construction of T01–T03 until relevant PBN measures are in place; and
- requiring outstanding aviation matters to be resolved to the satisfaction of AirNav and other aviation bodies before construction or operation.

The CLG considers that these proposals raise an important planning distinction.

A planning condition can appropriately regulate the detailed implementation of an **already demonstrated mitigation measure**.

For example, a condition may:

- specify timing;
- require implementation before commissioning;
- establish monitoring;
- require certification; or
- govern detailed installation.

That is different from using a condition to defer the fundamental question of **whether an acceptable mitigation exists at all**.

The current aviation issues depend upon matters including:

- future PBN development;
- possible redesign of IFPs;



- ATCSMAC alteration;
- radar modification;
- possible supplementary radar infrastructure;
- safety-case approval;
- IAA regulatory processes;
- AirNav operational acceptance;
- Shannon Airport acceptance; and
- potentially third-party land or infrastructure.

The Applicant does not control all of those matters.

This is closely related to the CLG's wider submission concerning legal interest and the deliverability of mitigation.

A commitment by the Applicant to fund or facilitate mitigation is not the same as demonstrating that the mitigation can actually be approved and implemented.

The Commission should therefore ask:

Is the aviation mitigation before the Commission sufficiently defined, accepted and deliverable for the Commission to rely upon it when granting permission?

In the CLG's view, it is not.

The practical effect of the proposed conditions would be to grant permission while leaving the most important aviation constraint to be resolved afterwards.

Given that AirNav presently states that the Woodcock Hill deflection issue cannot be mitigated in its opinion, that would reverse the appropriate sequence of decision-making.

The aviation problem should first be resolved.

Only then should detailed implementation appropriately be conditioned.



Climate Policy Does Not Override Aviation Safety

The CLG fully acknowledges:

- the seriousness of climate change;
- Ireland's statutory climate obligations;
- national renewable-energy objectives; and
- the important role of wind energy within the transition away from fossil fuels.

Nothing in this aviation response should be interpreted as opposition to renewable energy in principle.

However, climate policy does not establish that every renewable-energy proposal must be permitted irrespective of its particular location or effects.

The obligations imposed upon public bodies by the Climate Action and Low Carbon Development legislation are themselves framed within the performance of their statutory functions.

The Supreme Court's judgment in the **Coolglass** proceedings is relevant in rejecting an interpretation under which climate obligations operate as an automatic overriding presumption in favour of renewable-energy development.

The requirement is to exercise statutory functions consistently with climate objectives **insofar as practicable**, having regard to the applicable statutory framework.

Accordingly, AirNav, the IAA, Shannon Airport and the Commission are entitled — and required — to continue performing their aviation safety and planning functions.

The practical question is therefore not:

Does Ireland require renewable energy?

It plainly does.

The relevant question is:



Can this particular renewable-energy development be accommodated at this particular location without unacceptable effects upon safety-critical aviation infrastructure and airport operations?

Where a wind energy development can coexist safely with aviation infrastructure, AirNav's history demonstrates that such developments can and do proceed.

Where the specific location creates unresolved effects upon an en-route radar, airport radar, flight procedures or navigation infrastructure, renewable-energy policy does not remove the need to resolve those effects.

The CLG therefore submits that refusal of a particular wind farm because of unresolved aviation-safety constraints would not amount to rejection of climate policy.

It would constitute the proper application of climate, planning and aviation-safety obligations together.

Overall Aviation Conclusion

The Applicant's Further Information contains a substantial body of additional aviation material.

However, quantity of information is not the central issue.

The relevant question is whether that information demonstrates a **safe, operationally acceptable, regulatorily approvable and deliverable solution** to the aviation effects identified.

In the CLG's view, it does not.

The following matters remain material:

- **Instrument Flight Procedures**

A number of existing procedures and obstacle-protection arrangements remain affected.

Possible redesigns have been considered, but final operational acceptance and regulatory approval have not been demonstrated.



- **ATCSMAC**

The proposed development continues to affect the ATCSMAC and therefore has potential consequences for controller vectoring flexibility and workload.

Whether redesigned arrangements are operationally acceptable is ultimately a matter for the relevant aviation bodies, not merely the Applicant's consultants.

- **PBN**

The future PBN programme does not resolve surveillance impacts as contended by AI Bridges in the EIAR.

The future PBN programme does not fully mitigate the stated IFP impacts.

Its precise implementation timetable should not be treated as certain, particularly given the continuing requirement to retain conventional ground-based navigation infrastructure for resilience against GNSS interference.

- **Navaid calibration**

The Applicant has not clearly demonstrated that the actual Knockshanvo/Oatfield configuration can coexist with the required regulatory flight-inspection and calibration profiles for the navigation aids serving Shannon Airport.

This requires project-specific resolution.

- **Woodcock Hill MSSR**

This is the most significant unresolved issue.

The evidence demonstrates:

- line of sight between the radar and turbines;
- predicted OBE/beam-deflection effects;
- concern regarding shadowing;
- potential radar coverage gaps within controlled airspace;
- cumulative effects when Knockshanvo and Oatfield are considered together; and
- the absence of the comparable in-service evidence specifically sought by AirNav.

Most importantly, AirNav has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”



It has also stated that its IAA-approved change-management system does not permit changes resulting in a functional system which is less safe than the original system.

No evidence in the Further Information demonstrates that AirNav has withdrawn that position.

- **Shannon Primary Surveillance Radar**

Potential turbine clutter is acknowledged.

Various possible upgrades or modifications are discussed.

However, no single agreed solution has been demonstrated to the Commission as technically selected, operationally accepted and capable of implementation before the wind farm becomes operational.

- **Case studies**

The international and domestic case studies do not provide the directly comparable operational evidence requested by AirNav.

Several demonstrate materially different radar applications, substantially greater turbine separation distances or circumstances where turbine relocation/removal formed part of the solution.

They therefore do not establish that the Knockshanvo effects can safely be accommodated.

- **Proposed conditions**

The proposed planning conditions do not resolve these issues.

They would defer critical aspects of aviation mitigation until after permission while leaving their implementation dependent upon:

- technical redesign;
- regulatory approval;
- third-party agreement;
- future infrastructure; and
- acceptance by AirNav and Shannon Airport.



That is fundamentally different from conditioning the detailed implementation of mitigation whose feasibility is already established.

Final CLG position on Aviation

The aviation case can therefore be reduced to a relatively straightforward proposition.

The Applicant acknowledges that aviation impacts arise.

AirNav operates the safety-critical surveillance system affected by those impacts.

AirNav has stated that radar beam deflection cannot, in its opinion, be mitigated and that shadowing would introduce coverage gaps in controlled airspace.

The Applicant proposes a range of possible future technical and procedural solutions, but no final solution accepted by AirNav and the relevant regulator has been demonstrated.

The comparable operational evidence specifically requested by AirNav has not been provided.

The planning decision should not require the State's aviation bodies to discover after permission is granted whether an acceptable solution can be found.

Nor should safety-critical national aviation infrastructure be placed in a position where an existing level of operational performance must subsequently be modified to accommodate a development for which the mitigation remains uncertain.

The appropriate sequence is the opposite.

The Applicant should first demonstrate that the proposed development can be safely accommodated and that all essential aviation mitigation is technically viable, regulatorily acceptable and practically deliverable. Only once that has been demonstrated should permission be considered.

That demonstration has not been made.

The CLG therefore submits that the unresolved effects upon Instrument Flight Procedures, the ATCSMAC, navigation-aid calibration, Shannon Primary Surveillance



Radar and, most importantly, the Woodcock Hill en-route MSSR constitute substantial aviation and planning constraints.

In the absence of an agreed and demonstrated solution to those constraints, the CLG respectfully submits that the Commission cannot be satisfied that the proposed Knockshanvo Wind Farm can be developed without unacceptable effects upon aviation safety, air-navigation services and the safe and efficient operation of Shannon Airport.

The aviation evidence therefore provides an independent and substantial basis upon which permission for the proposed development should be refused.



5. Response to FuturEnergy Ireland Further Information

Response 01 – Project Splitting and Cumulative Assessment

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.4.3 – *Project Splitting*, p. 22.

The Applicant rejects the contention that the proposed Knockshanvo Wind Farm and the proposed Oatfield Wind Farm constitute project splitting. The Applicant states that:

- Oatfield is "an entirely separate project";
- it is being progressed by a different developer under separate landowner agreements;
- other than geographical proximity, it bears no relation to the Knockshanvo proposal; and
- Oatfield has been fully assessed within the cumulative impact assessment prepared for the Knockshanvo application. The Applicant concludes that Oatfield is not functionally integral to the proposed development and that progressing the two projects separately does not constitute project splitting.



Issue

Whether the Further Information adequately addresses concerns that the proposed Knockshanvo and Oatfield wind farms represent an artificially separated assessment of development within the same upland landscape, resulting in an inadequate assessment of cumulative environmental effects.

CLG Assessment

The Applicant's response is limited to asserting that the two projects are legally separate because they are promoted by different developers under separate landownership. While those facts are relevant, they are not determinative of whether the environmental effects of closely related developments have been properly assessed.

The principal concern raised by the CLG is not that the applications are procedurally invalid simply because they have separate applicants. Rather, the concern is whether the environmental assessment has properly considered the combined consequences of two major wind farm proposals within the same upland landscape, sharing the same visual envelope, ecological receptors, hydrological setting, transport network and aviation environment.

Although the Applicant refers to a cumulative impact assessment, the Further Information does not explain why two substantial wind energy developments within the same geographical area were advanced independently rather than through a coordinated planning strategy. Nor does it address the concern that the environmental effects experienced by receptors arise from the combined presence of both developments rather than from each project in isolation.

This concern is reflected independently within the planning record. Clare County Council questioned the rationale for separate planning applications and expressed concern regarding the piecemeal development of the wider strategic wind energy lands, identifying cumulative landscape, ecological and infrastructure implications arising from multiple developments within the area. The Applicant reiterates its original position but does not materially engage with those concerns.

The Applicant also relies upon the existence of a cumulative assessment as evidence that project splitting has not occurred. However, the preparation of a cumulative assessment does not, of itself, resolve concerns regarding the manner in which strategically related developments are presented for assessment. The adequacy of the



cumulative assessment remains a separate planning issue considered elsewhere in this submission.

The CLG further notes that numerous elements of the planning record require assessment within the context of both developments, including landscape and visual impact, aviation, hydrology, peatland, biodiversity, traffic and residential amenity. The Applicant's response does not demonstrate that these interactions have been assessed with sufficient depth to enable the Commission to fully understand the combined environmental consequences of development across the wider upland area.

This concern is most obviously highlighted by the Applicant's request for an Oral Hearing in respect of the aviation issues when an Oral Hearing in relation to the same aviation matters has already taken place in respect of the adjacent Ballycar Wind Farm planning application. Had the planning applications for Ballycar, Oatfield and Knockshanvo been dealt with as one project, this would not have arisen and proper consideration of the cumulative impact of all three projects as one would have been possible

CLG Conclusion

The Further Information does not satisfactorily resolve the CLG's concerns regarding the potential for piecemeal assessment and, in particular, the adequacy of the cumulative assessment of Knockshanvo and Oatfield.

The Applicant has demonstrated that Knockshanvo and Oatfield are separate planning applications promoted by different legal entities. However, this does not, in itself, resolve the substantive planning issue raised by the CLG regarding the assessment of closely related developments within the same receiving environment.

The Applicant's reliance on the existence of a cumulative assessment is not sufficient to demonstrate that the combined environmental effects of the two developments have been fully evaluated or that the wider planning concerns identified by the CLG and Clare County Council have been adequately addressed.

Accordingly, the CLG submits that the Further Information does not satisfactorily resolve the concerns relating to project splitting and the adequacy of the cumulative assessment, and these issues remain material considerations for the Commission in determining the application.



Response 02 – Planning Policy Compliance

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.3 – Planning Policy Compliance, pp. 10–21.

The Applicant rejects observations that the proposed development contravenes the Clare County Development Plan 2023–2029 (CCDP) and other planning policy. It states that the application was supported by a comprehensive Planning Report demonstrating compliance with international, national, regional and local planning policy relating to renewable energy, climate action and sustainable development. The Applicant specifically addresses alleged conflicts with a number of CCDP objectives, including those relating to climate action, agriculture, recreational routes, landscape, renewable energy, biodiversity and cultural heritage, concluding that the proposed development is fully consistent with the CCDP and will assist Clare County Council in achieving its renewable energy and climate objectives.

Issue

Whether the Further Information demonstrates that the proposed development complies with the Clare County Development Plan 2023–2029 and associated planning policy when considered in the context of the wider planning record.

CLG Assessment

The Applicant's response principally relies upon a policy compliance exercise which considers individual development plan objectives in isolation before concluding that no policy conflict arises. While this demonstrates that the Applicant has considered the relevant planning framework, it does not adequately address the wider balancing exercise required under the Planning and Development Act.

The CLG does not dispute that national and regional planning policy strongly supports the expansion of renewable energy generation. Equally, there is no dispute that the Clare



County Development Plan identifies broad support for wind energy development in appropriate locations. However, those policy objectives are expressly qualified by the requirement that development must protect environmental, landscape, ecological, residential and aviation interests.

The Applicant's analysis gives considerable weight to those policies supporting renewable energy but affords comparatively limited consideration to policies intended to safeguard sensitive environmental receptors. This is particularly evident in relation to landscape protection, biodiversity, cumulative development, aviation safeguarding and residential amenity, all of which are addressed elsewhere in the planning record.

Importantly, the Applicant's conclusion that the proposal is fully consistent with the CCDP is not shared by all parties to the planning process. While Clare County Council acknowledged the strategic policy support for renewable energy, its Chief Executive's Report identified a number of significant concerns regarding cumulative development, landscape and visual impact, ecology, roads, hydrology and aviation. Those concerns demonstrate that policy compliance cannot be determined solely by reference to those objectives promoting renewable energy but requires consideration of the Development Plan as a whole.

The planning balance is also informed by subsequent developments since the application was lodged. In particular, the Commission's decision to refuse permission for the neighbouring Ballycar Wind Farm demonstrates that national climate policy, while an important material consideration, does not outweigh unresolved environmental or aviation concerns where the evidence does not satisfactorily demonstrate that those impacts can be avoided.

Accordingly, the Applicant's conclusion that the proposal is fully compliant with the CCDP depends upon acceptance of its technical assessments in respect of landscape, ecology, hydrology, noise, aviation and cumulative impacts. Those matters remain the subject of substantive disagreement throughout the planning record and are addressed individually within this submission.

CLG Conclusion

The Further Information does not establish that the proposed development is fully compliant with the Clare County Development Plan 2023–2029.

While the Applicant correctly identifies the strong policy support for renewable energy and climate action, the assessment places insufficient weight on those Development



Plan objectives requiring the protection of landscape character, biodiversity, water resources, residential amenity, aviation safety and other environmental assets.

When the Development Plan is read as a whole, and having regard to the concerns identified elsewhere in the planning record, including those of Clare County Council and the Commission's recent approach in comparable applications, the Applicant has not demonstrated that the proposal achieves an appropriate planning balance.

Accordingly, the CLG submits that the Further Information does not satisfactorily resolve the policy compliance concerns raised in the original observations, and these matters remain material considerations for the Commission.

Response 03 – Impacts on Habitats (Peatlands, Woodland and Flora)

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.6.1 – *Impacts on Habitats (Peatlands, Woodland and Flora)*, pp. 24–27.

The Applicant responds to observations concerning peatland, wet heath, woodland and flora by stating that:

- the proposed development will result in the loss of **0.9 ha of wet heath/upland blanket bog**, with no wet heath occurring in the vicinity of the proposed grid connection;
- wet heath occurring within gaps in commercial forestry, particularly in the vicinity of Turbines T08 and T09, has been mapped and assessed and is characterised as degraded and encroached by conifers;
- intact peatland habitats have been avoided through project design;
- there will be no loss of cutover bog and only negligible loss of dry siliceous heath;
- no significant cumulative effect on wet heath is predicted when Knockshanvo is considered with the proposed Oatfield Wind Farm;
- the Biodiversity Management Plan (“BMP”) will provide habitat restoration and enhancement, including peatland restoration following permanent forestry removal;



- the acknowledged loss of **0.45 ha of oak-ash-hazel woodland** will be addressed through **0.9 ha of replacement planting**, with monitoring and adaptive management;
- Reindeer Moss (*Cladonia portentosa*) was recorded during botanical surveys; and
- *Sphagnum austinii* was not recorded within the footprint of the proposed development, although the Applicant acknowledges that it may occur within good-quality peatland habitat in the wider area.

The Applicant concludes that the proposed avoidance, restoration, replacement planting and monitoring measures are sufficient to prevent significant residual habitat effects.

Issue

Whether the Further Information demonstrates that the ecological effects of the proposed development have been adequately assessed not merely in terms of the **area of habitat directly removed**, but having regard to the ecological functions performed by the affected peatland, wet heath, woodland and associated habitats, including hydrological function, habitat connectivity, botanical diversity, maturity, fragmentation and resilience; and whether the proposed restoration and replacement measures provide sufficient certainty that those functions will be maintained or restored within an ecologically meaningful timeframe.

CLG Assessment

The Further Information provides additional explanation of the Applicant's habitat calculations and proposed mitigation.

However, the central issue is not simply whether areas of habitat loss and replacement have been quantified. It is whether the ecological functions presently provided by the affected habitats will be maintained or restored following development.

Habitat area is not equivalent to ecological function

The Applicant's assessment places substantial emphasis on numerical habitat areas: 0.9 ha of wet heath/upland blanket bog affected, 0.45 ha of oak-ash-hazel woodland removed, and larger areas proposed for restoration or replacement.



Those figures are relevant, but **habitat area alone cannot be regarded as a surrogate for ecological function.**

Peatland, wet heath and woodland derive their ecological value from characteristics including:

- hydrological integrity;
- botanical composition;
- vegetation structure and maturity;
- connectivity with adjoining habitats;
- soil and peat processes;
- habitat continuity;
- availability of refuges and ecological corridors; and
- the wider ecosystem processes supported by the habitat mosaic.

The Applicant's own project description confirms that the BMP is intended to offset losses of wet heath, woodland and hedgerow/treeline and to ensure “no net permanent loss” of these habitats.

However, demonstrating that a greater numerical area will ultimately be restored or planted does not, in itself, demonstrate that the ecological functions lost will be replaced to an equivalent standard or within the same timeframe.

That distinction is particularly important where the Applicant's conclusion of no significant residual effect depends upon the success of future restoration.

Wet heath should not be assessed solely by reference to its condition or direct footprint

The Applicant confirms that the 0.9 ha of wet heath affected is principally habitat occurring within gaps in commercial forestry and describes it as degraded and subject to conifer encroachment.

The CLG accepts that habitat condition is relevant to ecological valuation.

However, classification of wet heath as degraded does not mean that it has no ecological function.

Semi-natural habitat occurring within a modified forestry landscape may continue to provide:



- connectivity between higher-quality habitat areas;
- refuge habitat;
- hydrological buffering;
- botanical diversity; and
- habitat for characteristic upland species.

The relevant assessment should therefore consider not only the 0.9 ha directly removed, but whether turbine infrastructure, roads, drainage works and associated construction will alter the **continuity and functional relationship** between the remaining wet heath, blanket bog, flushes, scrub and woodland habitats.

The Further Information does not materially expand the assessment of those functional fragmentation effects.

Avoidance of intact peatland does not, by itself, demonstrate protection of peatland function

The Applicant places considerable weight upon avoidance of intact peatland habitat.

That is an important design measure and reduces direct habitat loss.

However, peatland is a hydrologically dependent ecosystem. Avoidance of direct excavation within a particular habitat polygon does not necessarily demonstrate that its ecological function will remain unaffected where drainage, peat excavation, roads or other works occur within the same hydrological environment.

The ecological condition of blanket bog, wet heath and associated bryophyte communities depends upon the maintenance of appropriate water-table and drainage conditions.

The detailed hydrological issues are addressed separately in Responses 11 and 32–34 of this submission. However, those issues are also relevant to the habitat assessment because uncertainty regarding hydrological effects necessarily affects confidence in predictions concerning the future condition of hydrologically dependent habitats.

The Commission should therefore avoid treating the absence of direct land-take from intact peatland as equivalent to the absence of ecological effect.



Recent Irish Research on Peatland Degradation and Carbon Loss

Recent Irish peer-reviewed research further reinforces the need for caution in assessing additional disturbance of peatland environments. Habib et al. (2024), in a national study of Irish raised bogs, identify drainage, afforestation, peat extraction, agriculture and infrastructure development, including roads and wind farms, among the land uses contributing to peatland degradation. The authors explain that such land-use activities can damage peatland hydrological and ecological functioning, lower water tables and alter carbon and greenhouse-gas dynamics.

While the study concerns raised bog rather than the blanket-peat environment at Knockshanvo, its wider findings are relevant to the principle that peatland disturbance and drainage can have consequences extending beyond the immediate development footprint, including effects upon hydrology and carbon storage.

The relevance of this research is therefore not that it establishes a site-specific impact at Knockshanvo, but that it reinforces the need for a conservative assessment of additional disturbance to peat soils and hydrological systems, particularly where the existing peatland environment is already modified or degraded.

Sphagnum austinii – the Applicant's response does not resolve the evidence presented by the CLG

The Applicant specifically addresses *Sphagnum austinii* (Austin's Bog-moss).

Its own EIAR records an NPWS database record for *Sphagnum austinii* within hectad R57.

In the Further Information, the Applicant states that the species was not recorded within the footprint of the proposed development during its dedicated surveys. It nevertheless acknowledges that:

“there is potential for it to occur in good condition peatland habitats in the wider area outside of the development footprint.”

The Applicant also comments upon photographic evidence submitted by the CLG and states that the photograph is “not likely” to contain *Sphagnum austinii*, principally having regard to the reported location of the photograph along a forestry road and the species' association with undisturbed raised and blanket bog.

The CLG does not accept that this resolves the matter.



The photograph submitted by the CLG has subsequently been examined and the identification as ***Sphagnum austinii*** confirmed by a suitably qualified university lecturer.

Accordingly, this is not simply a speculative assertion that the species might occur in the area. It constitutes additional site-specific evidence which should inform the understanding of the botanical interest of the wider Knockshanvo peatland environment.

The CLG acknowledges that the Applicant did not record *Sphagnum austinii* within the direct development footprint. The confirmed record does not, by itself, establish that the proposed development will cause a significant effect upon the species.

However, the relevant issue is wider than direct excavation of an individual plant.

Sphagnum communities perform an important peat-forming function and depend upon appropriate hydrological conditions. The Applicant's own acknowledgement that *S. austinii* may occur within good-quality peatland in the wider area reinforces the need to consider whether drainage, peat disturbance and other works could alter the ecological conditions supporting such bryophyte communities outside the direct infrastructure footprint.

The Commission should therefore take the confirmed record into account as part of the ecological baseline rather than relying solely upon its absence from the Applicant's mapped development footprint.

Replacement woodland does not immediately replace established woodland function

The Applicant acknowledges the loss of **0.45 ha of oak-ash-hazel woodland** and states that, in the absence of mitigation, this would constitute a significant effect at local scale.

The proposed response is the planting of **0.9 ha of the same woodland community type**, together with monitoring. The Applicant concludes that this will result in no significant residual effect and may provide a net gain in that habitat type.

The CLG accepts that replacement woodland planting is an appropriate mitigation measure and that planting at twice the area removed is potentially beneficial.

However, there is an unavoidable **temporal distinction between habitat area and habitat function**.



Newly planted woodland does not immediately reproduce the ecological characteristics of established woodland. Features such as mature vegetation structure, developed soils and ground flora, deadwood, nesting and roosting opportunities and established ecological relationships develop over substantial periods.

The relevant comparison is therefore not simply:

0.45 ha removed versus 0.9 ha planted.

It is also:

the ecological function lost at the time of removal versus the ecological function actually available during the period in which the replacement woodland becomes established.

The Further Information does not fully address that temporal deficit.

Restoration is beneficial, but its success should not be assumed

The Applicant's BMP contains substantial habitat restoration and management commitments.

These measures are positive and should be acknowledged.

The CLG also acknowledges that the BMP provides for monitoring, auditing and adaptive management. It would therefore be incorrect to suggest that the Applicant has proposed habitat restoration without any monitoring mechanism.

However, monitoring is a means of determining whether a measure is succeeding. It does not itself demonstrate in advance that the ecological outcome relied upon will be achieved.

This distinction is particularly important in relation to restoration of afforested peatland.

The Applicant's own description of the Hen Harrier enhancement measures illustrates the temporal nature of this process. Following permanent forestry removal and drain blocking, the area is to be **allowed to revert to peatland habitat**, with at least three growing seasons provided for revegetation before the operational phase.

That demonstrates that restoration is a process rather than an immediate ecological outcome.



The Commission should therefore be satisfied that the BMP contains sufficiently clear ecological success criteria and corrective mechanisms to determine:

- whether restoration is achieving the habitat condition and function assumed in the assessment;
- when that functionality has been achieved; and
- what additional measures will be required if restoration does not progress as predicted.

The existence of monitoring and adaptive management does not remove the underlying uncertainty regarding the time required to establish equivalent ecological function.

Habitat connectivity requires assessment across the wider ecological network

The CLG's original submission identifies peatland, wet heath, woodland, scrub, riparian habitat and linear vegetation as components of a connected upland ecological network.

The Applicant has assessed the individual habitat types and proposes restoration, replacement planting and enhancement.

However, ecological connectivity is not necessarily maintained simply because the total area of individual habitat types is replaced.

Roads, turbine hardstands, drainage infrastructure, forestry removal and other works can alter the permeability and continuity of a habitat mosaic even where the total area affected is relatively limited.

The Commission should therefore consider whether the proposed development changes the **functional relationship between habitats**, rather than assessing each habitat polygon solely as an individual receptor.

The cumulative assessment with Oatfield remains overly dependent upon habitat area

The Applicant expressly considers Oatfield in the cumulative biodiversity assessment.

Chapter 6 identifies habitat losses at Oatfield and then relies upon the habitat management measures proposed for both developments to conclude:



“no potential for significant cumulative effect on habitats as a result of the two developments when considered in-combination is predicted.”

The CLG therefore acknowledges that Oatfield has not been omitted from the assessment.

The concern is instead the **basis of the cumulative conclusion**.

Knockshanvo and Oatfield occupy the same wider upland ecological landscape. The combined ecological effect is not necessarily captured by adding the hectares directly removed by each project and then comparing those figures with the hectares proposed for restoration or enhancement.

The Commission should also consider whether the two developments together could affect:

- peatland hydrological function;
- continuity of wet heath and other semi-natural habitats;
- woodland and linear habitat connectivity;
- ecological corridors;
- habitat fragmentation; and
- resilience of the wider upland habitat mosaic.

This is particularly important where each development relies upon the continued availability and functioning of habitat elsewhere in the same landscape.

The Further Information does not provide materially new landscape-scale ecological analysis demonstrating that these combined **functional effects** have been resolved.

CLG Conclusion

The Further Information provides additional explanation of habitat mapping, calculated habitat losses, restoration proposals and monitoring. The CLG acknowledges that the Applicant has incorporated meaningful avoidance, replacement and enhancement measures into the development.

However, the response does not fully resolve the distinction between **replacement of habitat area and replacement of ecological function**.

In particular:



- the classification of affected wet heath as degraded does not establish that it lacks ecological connectivity, buffering or habitat function;
- avoidance of direct excavation within intact peatland does not, by itself, demonstrate that hydrologically dependent habitat outside the development footprint will remain unaffected;
- the CLG has provided photographic evidence of *Sphagnum austinii*, subsequently confirmed by a suitably qualified university lecturer, while the Applicant itself acknowledges the species' potential to occur within good-quality peatland in the wider area;
- replacement of 0.45 ha of established oak-ash-hazel woodland with 0.9 ha of new planting does not immediately replace the ecological functions of the woodland removed;
- monitoring and adaptive management provide mechanisms for responding to restoration outcomes but do not themselves demonstrate that the assumed ecological functionality will be achieved within the required timeframe; and
- although Oatfield has been included in the cumulative assessment, the conclusion of no significant cumulative habitat effect remains principally dependent upon project-level habitat calculations and restoration measures rather than a detailed assessment of combined landscape-scale ecological function.

The central issue is therefore not whether the Applicant has proposed habitat mitigation—it clearly has—but whether sufficient objective ecological evidence demonstrates that the **hydrological integrity, connectivity, maturity, botanical interest and ecological resilience represented by the affected habitats will be maintained or restored to the extent assumed in the assessment.**

The CLG submits that the Further Information does not provide sufficient certainty on those matters. The outstanding concerns regarding habitat function, restoration timescales and cumulative ecological fragmentation therefore remain material considerations for the Commission in determining the application.



Response 04 – Lesser Horseshoe Bat

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.6.2 – *Impacts on Bats*, pp. 27–29, together with Section 4.2.3.1 – *Lesser Horseshoe Bat*, pp. 79–82.

The Applicant responds to concerns regarding the potential effects of the proposed development on Lesser Horseshoe Bat by relying upon the bat surveys undertaken for the EIAR and NIS, the proposed turbine buffers, retention and replacement of linear habitat, operational curtailment and other mitigation measures.

In response to the Department of Housing, Local Government and Heritage, the Applicant maintains that the bat survey programme was undertaken in accordance with recognised guidance and that the 2022 survey programme, supplemented by 2021 data, provides a robust basis for assessment. It states that static detectors achieved good spatial coverage and that Lesser Horseshoe Bat was recorded at all ten detector locations in 2022 and at all twelve detector locations used in 2021.

The Applicant also responds specifically to concerns regarding noise and blasting. It states that the nearest SAC roosts are located **more than 1.3 km from wind farm infrastructure**, that vibration and air overpressure from controlled blasting attenuate rapidly with distance, and that significant effects are therefore not anticipated. It relies upon CIEEM Bat Mitigation Guidelines, NatureScot guidance and a case study in which Lesser Horseshoe Bats were reportedly recorded within 4 m of drilling works without waking. It further proposes that any blasting would occur during daylight hours, outside dusk and dawn periods, and would be subject to controls on timing, intensity and frequency.

In relation to habitat connectivity, the Applicant states that the design retains key treelines and hedgerows and that new roads and turbine buffers may themselves create additional linear habitat for commuting and foraging. It also relies upon the Biodiversity Management Plan, including retention and enhancement of existing linear features and planting of native hedgerows and trees.

The Applicant therefore maintains that the proposed development will not adversely affect the conservation status of Lesser Horseshoe Bat or the integrity of the relevant European sites.



Issue

Whether the Further Information demonstrates, with sufficient site-specific certainty, that the proposed development will not adversely affect Lesser Horseshoe Bat through disturbance, blasting, loss or alteration of commuting and foraging habitat, changes in landscape connectivity or cumulative interaction with Oatfield and other wind energy development, particularly given the Applicant's own evidence of widespread Lesser Horseshoe Bat use of the Knockshanvo site and the International Importance assigned to the population using the western part of the development area.

CLG Assessment

The Further Information materially expands upon the Applicant's original response to Lesser Horseshoe Bat concerns.

Notwithstanding this additional material, significant concerns remain.

However, the additional material also confirms the ecological importance of the site and leaves a number of significant matters unresolved.

The Applicant's own evidence demonstrates substantial Lesser Horseshoe Bat use of the site

The importance of the Knockshanvo site for Lesser Horseshoe Bat should be the starting point for the assessment.

The Applicant's 2022 static detector surveys recorded **1,098 Lesser Horseshoe Bat passes** across the site. The species occurred at almost all detector locations, with higher activity concentrated in the central and western areas. In autumn 2022, Lesser Horseshoe Bat activity was recorded at **9 of 10 detector locations**.

The Bat Baseline Report further concludes that the species is likely to use the conifer plantation for foraging and commuting to and from known roosts and potentially other unreported roost locations.

Most importantly, Chapter 6 of the EIAR states that the western part of the proposed development, including **T01, T02, T03 and the enhancement area**, overlaps the core foraging range of Lesser Horseshoe Bat roosts designated under Danes Hole,



Poulnalecka SAC. On that basis, the Applicant assigns the Lesser Horseshoe Bat population recorded in that part of the site **International Importance**.

The issue is therefore not the occasional presence of a protected bat species.

The Applicant's own evidence establishes widespread use of the proposed development site by a population which it considers to be of International Importance.

That level of use requires a correspondingly robust assessment of disturbance, habitat connectivity and cumulative effects.

Survey effort is substantial, but the age of the baseline remains relevant to roost occupation

The CLG accepts that the Applicant undertook bat surveys over two years rather than relying upon a single season.

The Applicant states that 2022 surveys were supplemented by 2021 survey data and that this exceeds the one-year survey period referred to in the guidance upon which it relies.

Accordingly, it would not be appropriate to suggest that the historical activity dataset is automatically inadequate simply because it dates principally from 2021–2022.

However, the Applicant's own mitigation recognises an important distinction between general activity data and **current roost occupation**.

The Schedule of Mitigation records that trees within the proposed transition compound contain potential roost features and therefore requires a pre-commencement survey specifically:

“to assess any changes in baseline environment since the time of undertaking the surveys”.

If a roost is identified at that stage, felling will not proceed until a derogation is obtained.

The Applicant therefore itself recognises that roost conditions may change after the original survey.

The Commission should accordingly distinguish between accepting the 2021–2022 dataset as useful evidence of the general bat environment and assuming that it provides definitive evidence of roost occupation at the time construction commences.



Where works could affect potential roost features, sufficiently current verification remains necessary.

The Further Information contains an imprecise statement concerning bat roosts

The Applicant's Further Information states:

“No roosts were identified within the Wind Farm Site during the surveys”.

However, the Bat Baseline Report records:

“A small Soprano pipistrelle roost was identified in a derelict stable within the Site approximately 260m south of turbine T06”.

It then correctly distinguishes that position from the Lesser Horseshoe Bat assessment by stating that no Lesser Horseshoe Bat roosts were identified within the Proposed Development Site.

The relevant distinction is therefore between:

- no Lesser Horseshoe Bat roost having been identified within the site;
- no bat roost occurring within the actual development footprint; and
- no bat roost occurring anywhere within the wider Wind Farm Site.

Those are not the same proposition.

The FI statement that “no roosts” were identified within the Wind Farm Site appears overly broad when compared with the Applicant's own baseline report.

This does not establish an adverse effect on Lesser Horseshoe Bat, but it illustrates the need for precision in relying upon absence of roosts as part of the mitigation case.

The blasting response remains insufficiently site-specific

The Applicant relies materially upon the proposition that the nearest SAC Lesser Horseshoe Bat roosts are more than **1.3 km from wind farm infrastructure** and that vibration from blasting will attenuate sufficiently over that distance.

However, the Further Information does not identify the **nearest actual or potential blasting location** to the relevant roost.



That distinction matters.

Where the conclusion of no significant effect depends upon attenuation with distance, the relevant separation is the distance between the **blast source and the roost receptor**, not merely a generalised distance between a SAC roost and “wind farm infrastructure”.

The Further Information also does not provide:

- a site-specific blasting design;
- predicted ground-vibration levels at the relevant SAC roost;
- the charge weight or other blast parameters upon which such a prediction would depend; or
- a receptor-specific demonstration that disturbance thresholds will not be approached.

The Applicant instead relies substantially upon generic attenuation principles and published guidance.

Those sources are relevant, but they are not a substitute for a site-specific receptor assessment where the Applicant's own survey evidence demonstrates that the site forms part of the functional habitat of an Internationally Important Lesser Horseshoe Bat population.

Daytime blasting does not, by itself, address disturbance of roosting bats

The Applicant states that blasting, if required, would take place during daylight hours and outside dusk and dawn periods.

This is sensible insofar as it reduces interaction with bats actively commuting and foraging.

However, Lesser Horseshoe Bats are generally occupying roosts during daylight hours.

Accordingly, daytime scheduling does not itself demonstrate that roost disturbance will be avoided.

The relevant question for a roosting bat is the level and character of the **noise and ground-borne vibration reaching the roost**.



The Applicant attempts to address that issue through its reliance upon distance and published evidence. However, as noted above, no Knockshanvo-specific prediction of vibration at the relevant SAC roost is presented.

The Commission should therefore avoid treating daytime working as a complete answer to potential roost disturbance.

Evidence concerning drilling is not directly equivalent to blasting

The Applicant further relies upon a case study in which Lesser Horseshoe Bats were reportedly recorded within **4 m of drilling works and did not wake**.

That evidence is potentially relevant to construction disturbance.

However, drilling and controlled blasting are materially different sources.

Blasting is an impulsive event capable of generating different levels and characteristics of ground vibration and air overpressure.

Accordingly, evidence that bats remained torpid during nearby drilling cannot automatically demonstrate that bats would respond in the same way to blasting.

The Applicant's case would be materially stronger if supported by a site-specific blast assessment demonstrating the actual vibration predicted at the relevant roosts.

The derogation position is conditional upon future survey findings

The CLG does not contend that the absence of a derogation licence presently establishes that the development is unlawful.

The Applicant's own mitigation explains the position more accurately.

No project derogation has presently been identified as necessary because the Applicant has not identified an affected bat roost within the relevant works footprint. However, trees with potential roost features occur at the transition compound, and the Applicant expressly provides that if a roost is identified during the required pre-commencement survey, the relevant trees will not be felled until a derogation is obtained.

The material point is therefore that the Applicant's present conclusion that no derogation is required is **conditional upon its current understanding of roost occupation**.



This reinforces the importance of the pre-commencement survey and demonstrates that the roost baseline is not treated by the Applicant itself as immutable.

Local habitat connectivity is addressed, but the wider population-connectivity issue remains

The Applicant does provide a substantive response concerning local commuting habitat.

It states that existing treelines and hedgerows will be retained where possible and that new roads and turbine buffers may create additional linear habitat through areas of closed plantation forestry.

The Biodiversity Management Plan also proposes retention and enhancement of linear features, including native hedge and tree planting, within the mapped Lesser Horseshoe Bat foraging range.

These are positive measures and should be acknowledged.

However, the wider concern raised by the CLG is not confined to the presence or absence of an individual hedgerow.

The Lesser Horseshoe Bat Species Action Plan and the CLG's earlier evidence identify the importance of maintaining **landscape-scale connectivity between colonies**, including connectivity relevant to gene flow and long-term population resilience. The original CLG evidence specifically raised concerns regarding the cumulative effect of Knockshanvo, Oatfield and other developments on movement between colonies.

The Applicant's FI response largely addresses connectivity at the **site scale** through retention and replacement of linear vegetation.

What is less clearly demonstrated is whether the development, particularly cumulatively with Oatfield and other wind farms, could alter functional connectivity at the broader **colony-to-colony landscape scale**.

For an Annex II species whose long-term conservation depends upon connectivity between roost populations, this distinction is material.



Habitat loss and replacement also require consideration in functional terms

The EIAR identifies the unmitigated loss of approximately **920 m of hedgerow and treeline habitat** associated with the access road and turbine delivery route as a significant effect on bats at the local scale.

The Applicant proposes replacement planting and enhancement and maintains that commuting and foraging habitat will remain available.

That may reduce the effect.

However, replacement planting does not immediately provide the same structural or ecological function as mature existing linear vegetation.

This is particularly important for Lesser Horseshoe Bat because established hedgerows, woodland edges and other continuous dark linear features are used for navigation, commuting and foraging.

The Commission should therefore assess connectivity by reference to **functional continuity over time**, rather than solely comparing the length of linear habitat removed and subsequently replanted.

The cumulative Knockshanvo/Oatfield context remains important

The proposed Knockshanvo Wind Farm must not be considered as an isolated development in relation to Lesser Horseshoe Bat.

Oatfield occupies the same wider upland landscape and affects the same general network of bat foraging and commuting habitat.

For a species moving between roosts and foraging areas, individual planning boundaries have little ecological meaning.

The Applicant's conclusion of no significant effect must therefore be robust not merely at individual turbine or project level but across the wider landscape potentially affected by multiple wind energy developments.

This is especially important given the Applicant's own finding that the western Knockshanvo area overlaps the core foraging range of SAC-associated roosts and that the population using that area is likely to be of **International Importance**.



The Further Information does not provide a new landscape-scale analysis demonstrating that the combined Knockshanvo/Oatfield development will preserve colony-to-colony connectivity and the wider functional habitat network upon which the species depends.

CLG Conclusion

The Further Information provides a materially more detailed response to the concerns regarding Lesser Horseshoe Bat, and notwithstanding this additional material, significant concerns remain.

The additional evidence does not remove all of the substantive concerns.

Most importantly, the Applicant's own survey evidence demonstrates that Lesser Horseshoe Bat makes widespread use of the proposed development site. **1,098 passes were recorded during the 2022 static surveys**, the species was recorded across almost the entire detector network, and the population using the western part of the development site is assigned **International Importance** because that area overlaps the core foraging range of SAC-designated roosts.

Against that baseline, the blasting assessment remains insufficiently site-specific. The Applicant relies upon a general separation of more than 1.3 km between SAC roosts and “wind farm infrastructure” but does not identify the nearest potential blasting source or provide predicted vibration levels at the relevant roost. Daytime blasting reduces interaction with actively foraging bats but does not itself demonstrate that roosting bats will not be disturbed, while evidence concerning response to drilling cannot automatically be equated with response to controlled blasting.

The principal bat dataset also dates from 2021–2022. The CLG does not contend that this renders the general activity assessment invalid, but the Applicant itself recognises that roost conditions may change by requiring pre-commencement surveys and, where a roost is subsequently identified, a derogation prior to felling.

The Applicant has also addressed local commuting habitat through retention and replacement of treelines and hedgerows. However, the wider issue of **landscape-scale connectivity between Lesser Horseshoe Bat colonies**, particularly cumulatively with Oatfield and other wind-energy development, has not been demonstrated with equivalent clarity.

Accordingly, the CLG submits that the Further Information does not provide sufficient certainty to conclude that disturbance, habitat alteration and cumulative changes to



functional connectivity will have no adverse effect upon the Lesser Horseshoe Bat population associated with the relevant SAC roosts.

Given the Applicant's own classification of that population as being of **International Importance**, the Commission should require a particularly robust evidential basis before concluding that the proposed development will not adversely affect the species or undermine the conservation objectives of the relevant European sites.

Response 05 – Natura Impact Statement

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.6.6 – *Natura Impact Statement*, pp. 32–33.

The Applicant responds to observations concerning the adequacy of the Natura Impact Statement (“NIS”) and maintains that the proposed development will not adversely affect the integrity of any European site.

The Applicant states, in summary, that:

- the mitigation measures contained within the NIS are preventative and proactive and are based upon avoidance, design and construction controls intended to protect water quality;
- comprehensive controls are proposed for sediment management, pollution prevention, drainage, dewatering, watercourse crossings, forestry operations and construction activities;
- rock blasting has been assessed and will not result in significant disturbance to Qualifying Interest species, including Lesser Horseshoe Bat;
- the NIS appropriately focuses upon the Qualifying Interests (“QIs”) and Special Conservation Interests (“SCIs”) of the relevant European sites;
- although hydrological connectivity exists between the Proposed Development and the River Shannon and River Fergus Estuaries SPA, mitigation measures will prevent deterioration in downstream water quality;
- updated Site-Specific Conservation Objectives for Lough Derg (Shannon) SPA do not alter the conclusions of the original assessment; and
- no residual adverse effects upon the integrity of any European site will arise.



Issue

Whether the NIS and Further Information, considered together, contain sufficiently complete, precise and definitive findings and conclusions to enable the Commission to determine, **in the absence of reasonable scientific doubt**, that the proposed development, either alone or in combination with other plans and projects, will not adversely affect the integrity of any European site having regard to its conservation objectives.

CLG Assessment

The CLG acknowledges that the Applicant is not required to prepare an entirely new NIS merely because observations have been submitted or because further clarification has been requested.

The relevant question is whether the **totality of the information now before the Commission** provides a sufficiently robust scientific basis for the conclusion that adverse effects on European-site integrity can be excluded.

The Applicant has identified substantial avoidance, drainage, pollution-control and ecological mitigation measures. The existence of those measures is relevant and should be acknowledged.

However, where the conclusion of no adverse effect depends upon the successful operation of mitigation, the Commission must also be satisfied that the effectiveness of the measures relied upon is established with sufficient certainty before consent is granted.

The hydrological pathway to downstream European sites is accepted

An important feature of the Applicant's assessment is that the existence of a hydrological pathway between the Proposed Development and downstream European sites is not disputed.

The Applicant acknowledges hydrological connectivity between the Proposed Development and the **River Shannon and River Fergus Estuaries SPA**.

The Appropriate Assessment issue is therefore not whether a pathway exists, but whether the measures proposed to prevent sediment, pollutants or other water-quality



effects from travelling along that pathway are sufficiently reliable to exclude adverse effects upon the relevant QIs/SCIs and conservation objectives.

The Applicant relies upon a suite of measures including:

- drainage controls;
- settlement and attenuation measures;
- sediment management;
- pollution-prevention measures;
- controlled dewatering;
- watercourse-crossing measures;
- forestry-management controls; and
- construction-phase environmental management.

These are established forms of environmental mitigation and the CLG does not suggest that their use is inherently inappropriate.

However, their importance to the NIS conclusion means that the Commission must be satisfied not simply that such measures are proposed, but that the **site-specific hydrological understanding upon which their design and predicted effectiveness depend is sufficiently robust.**

This assumes particular significance where the measures must remain effective during periods of elevated rainfall and during construction activities involving peat excavation, drainage, forestry operations, road construction and other substantial ground disturbance.

Outstanding hydrological issues are relevant to the Appropriate Assessment

The hydrological issues identified elsewhere in this submission are therefore directly relevant to the NIS insofar as the same understanding of catchment behaviour, drainage pathways, runoff and water-quality protection is relied upon to exclude downstream effects upon European sites.

As addressed in **Responses 11 and 32–34**, specialist evidence submitted by the CLG raises issues concerning aspects of the Applicant's hydrological and hydrogeological assessment, including drainage pathways, peatland hydrology, groundwater and cumulative catchment effects.

Those issues are not repeated in full here.



Their significance for Appropriate Assessment is that uncertainty concerning the operation of the hydrological system may affect confidence in the predicted effectiveness of mitigation designed to interrupt the accepted source-pathway-receptor relationship.

The Commission must therefore consider the NIS together with those outstanding hydrological issues rather than treating the Appropriate Assessment and hydrological assessment as entirely separate exercises.

Lesser Horseshoe Bat and blasting

The NIS conclusion concerning Lesser Horseshoe Bat also depends upon the Applicant's assessment that construction activities, including blasting, will not result in significant disturbance to the species.

As addressed in detail in **Response 04**, the Applicant's own survey evidence establishes substantial use of the Knockshanvo site by Lesser Horseshoe Bat.

The 2022 static surveys recorded **1,098 Lesser Horseshoe Bat passes**, with the species occurring across almost the entire detector network. The Applicant further assigns the population using the western part of the development site **International Importance**, having regard to its relationship with the core foraging range of SAC-designated roosts.

That evidence increases, rather than diminishes, the importance of demonstrating with sufficient certainty that construction disturbance will not adversely affect the relevant SAC population.

The Applicant relies materially upon the proposition that the nearest SAC roosts are more than **1.3 km from “wind farm infrastructure”**, together with generic attenuation principles, published guidance and evidence concerning Lesser Horseshoe Bats remaining torpid during nearby drilling works.

As set out in Response 04, however, the assessment does not identify the nearest actual or potential **blasting source** to the relevant roost or provide a Knockshanvo-specific prediction of ground-borne vibration at that receptor.

The distinction is important because, where the conclusion of no disturbance depends materially upon attenuation with distance, the relevant distance is that between the actual blast source and the protected receptor.



Similarly, restricting blasting to daylight hours may reduce interaction with actively commuting or foraging bats but does not, by itself, demonstrate absence of disturbance to bats occupying daytime roosts.

Evidence concerning response to drilling is relevant but cannot automatically be assumed to demonstrate an equivalent response to controlled blasting, which is a different impulsive source of noise and ground vibration.

These matters are particularly relevant in the Appropriate Assessment context because the conclusion must concern effects upon the **SAC and its qualifying Lesser Horseshoe Bat interest**, rather than merely effects upon individual bats within the development site.

The blasting issue therefore remains material to the Commission's ability to exclude adverse effects on European-site integrity in the absence of reasonable scientific doubt.

The CLG accepts the Applicant's clarification regarding non-QI/SCI species

The Applicant explains that the NIS is confined to the Qualifying Interests and Special Conservation Interests of the European sites under assessment and that species such as Hen Harrier and White-Tailed Eagle cannot independently form part of the Article 6(3) integrity assessment where they are not QIs or SCIs of the relevant European site.

The CLG accepts that clarification.

The wider ecological significance of Hen Harrier, White-Tailed Eagle and other protected species remains relevant under the EIA and general biodiversity assessment and is addressed separately in this submission.

The CLG does not rely upon those species as independent qualifying features of European sites where they have not been designated as such.

This does not, however, alter the requirement for the NIS to examine all pathways capable of affecting the QIs/SCIs and conservation objectives of the European sites that are within the scope of Appropriate Assessment.



Updated Site-Specific Conservation Objectives for Lough Derg (Shannon) SPA

The Applicant acknowledges the updated Site-Specific Conservation Objectives (“SSCOs”) for **Lough Derg (Shannon) SPA** and concludes that they do not alter the findings of the original assessment.

The CLG does not suggest that publication of updated conservation objectives automatically requires preparation of an entirely new NIS.

The relevant issue is whether the updated objectives, including any relevant attributes and targets, have been examined against the impact pathways identified for the proposed development and whether the Applicant has demonstrated that they do not materially alter the original conclusion.

The Commission should therefore satisfy itself that the updated SSCO have been substantively integrated into the Appropriate Assessment rather than merely acknowledged, and that the evidence before it remains sufficient to determine that the project will not undermine the achievement of those conservation objectives.

Cumulative effects with Oatfield and other developments

The Applicant states that cumulative and in-combination effects have been considered.

The CLG acknowledges that other relevant developments, including Oatfield, have not simply been omitted from the assessment.

The issue is whether the **combined environmental processes** relevant to European sites have been assessed with sufficient certainty.

This is particularly important in relation to Knockshanvo and Oatfield.

The two developments occupy the same wider upland environment and may interact with shared drainage systems, catchments and downstream receiving waters. Both projects also rely upon project-specific drainage, sediment-control and pollution-prevention measures to prevent downstream effects.

The in-combination assessment should therefore consider the realistic combined construction scenario, including the possibility of overlapping ground disturbance, forestry works, drainage works and periods of elevated rainfall, rather than treating the effectiveness of each project's mitigation entirely in isolation.



The fact that each project individually proposes mitigation does not, by itself, establish the absence of an in-combination effect.

The Commission must be satisfied that the combined effect of the projects upon the relevant source-pathway-receptor relationships has been adequately considered and that the conservation objectives of the relevant European sites will remain protected.

Monitoring and adaptive management cannot substitute for prior certainty

The Applicant places reliance upon environmental monitoring and adaptive management as part of its mitigation framework.

The CLG accepts that monitoring is an important and legitimate component of environmental management.

There is, however, an important distinction between:

- **monitoring used to verify that an established mitigation measure is being implemented and performing as predicted, and**
- **monitoring used to determine after development has commenced whether a measure upon which the no-adverse-effect conclusion depends is actually effective.**

Monitoring may appropriately perform the former function.

It should not substitute for the prior demonstration, required at the decision-making stage, that mitigation relied upon to exclude adverse effects is capable of achieving its stated protective function.

Similarly, adaptive management can provide a useful mechanism for responding to unforeseen circumstances, but it should not be necessary to resolve a fundamental uncertainty as to whether the measures relied upon in the Appropriate Assessment will prevent adverse effects upon European-site integrity.

The Commission should therefore identify which mitigation measures are essential to the NIS conclusion and satisfy itself that their effectiveness is sufficiently established **before** permission is granted.



Interrelationship between the assessments

The NIS does not operate independently of the underlying technical assessments.

Its conclusions depend upon evidence concerning:

- hydrology and hydrogeology;
- peat stability;
- drainage design;
- peat management;
- habitat condition;
- Lesser Horseshoe Bat ecology;
- construction methodology; and
- cumulative effects.

Where the NIS relies upon those technical assessments to establish that an impact pathway will not result in an adverse effect, unresolved uncertainty within the underlying evidence may also be relevant to the Appropriate Assessment conclusion.

This does not mean that every disagreement concerning the EIAR automatically creates reasonable scientific doubt for Article 6(3) purposes.

However, where an unresolved issue concerns a pathway connecting the development to a QI/SCI of a European site, or concerns the effectiveness of mitigation relied upon to interrupt such a pathway, it must be resolved to the degree of certainty required for Appropriate Assessment.

CLG Conclusion

The CLG acknowledges that the Applicant has prepared a detailed NIS, has identified relevant European sites and source-pathway-receptor relationships, and has proposed an extensive suite of avoidance, water-quality and ecological mitigation measures.

The question is therefore not whether mitigation exists, nor whether the Applicant was required to prepare a completely new NIS in response to observations.

The question is whether the **NIS and Further Information, considered together with the underlying technical evidence now before the Commission**, enable the Commission to conclude, in the absence of reasonable scientific doubt, that the proposed development will not adversely affect the integrity of any European site.



The CLG considers that material uncertainty remains in particular regarding:

- the effectiveness of mitigation along the **accepted hydrological pathways** connecting the development to downstream European sites, having regard to the outstanding hydrological issues addressed elsewhere in this submission;
- the site-specific assessment of **blasting and Lesser Horseshoe Bat**, where the Applicant relies upon a general separation distance and published evidence without identifying the nearest potential blasting source or predicting vibration at the relevant SAC roost;
- the **in-combination effects of Knockshanvo and Oatfield**, particularly where both developments may affect shared catchments and rely upon project-specific drainage and sediment-control measures; and
- whether monitoring and adaptive management are being used solely to verify mitigation whose effectiveness has already been demonstrated, rather than to resolve uncertainty after development has commenced.

The CLG accepts the Applicant's clarification regarding species which are not Qualifying Interests or Special Conservation Interests and does not rely upon those species as independent features of the Article 6(3) assessment.

However, the remaining issues identified above concern pathways and mitigation directly relevant to the QIs/SCIs and conservation objectives of European sites.

Accordingly, unless those matters can be resolved on the evidence before it, the Commission **cannot safely conclude that no reasonable scientific doubt remains as to the absence of adverse effects on the integrity of the relevant European sites.**

The CLG therefore submits that the Further Information does not, when considered with the NIS and the outstanding technical issues identified elsewhere in this submission, resolve the concerns previously raised regarding the robustness of the Appropriate Assessment conclusions.



Response 06 – Gortacullin Bog NHA

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.6.8 – Gortacullin Bog NHA, p. 34, together with the detailed hydrological response in the HES Appendix (FI-2).

The Applicant rejects observations that the proposed development poses a significant risk to **Gortacullin Bog Natural Heritage Area (NHA)**. The Applicant states that:

- Gortacullin Bog NHA was identified in the EIAR baseline assessment but was screened out as a sensitive receptor because it is located **upgradient** of the proposed development;
- there are **no surface water pathways** between the proposed works and the NHA;
- groundwater will flow downslope, away from the NHA, such that there is no potential for groundwater quality effects;
- there is no potential for drawdown of the peat water table within the NHA because all significant excavations are located a substantial distance from the designated site; and
- accordingly, the proposed development will not adversely affect the hydrology or ecological integrity of Gortacullin Bog NHA.

Issue

Whether the Further Information demonstrates, on the basis of robust site-specific evidence, that the proposed development will not alter the hydrological regime of Gortacullin Bog NHA or otherwise conflict with the statutory protection afforded to the site.



CLG Assessment

The Further Information provides a more detailed explanation of the Applicant's hydrological conclusions but does not resolve the principal issue raised by the CLG and by independent hydrogeological evidence.

The Applicant's conclusion that Gortacullin Bog NHA can be screened out as a receptor is founded on the proposition that the bog is hydrologically disconnected from the proposed works because it is located upgradient and separated from the principal excavation areas. While this is presented as a definitive conclusion, the supporting analysis remains dependent upon the conceptual hydrogeological model adopted by the Applicant.

The planning record contains a fundamentally different expert opinion. Dr Pamela Bartley (Hydro-G) concludes that the information before the Commission is insufficient to establish that no hydrological connection exists between the proposed development and the NHA. She states that the hydrology chapter does not contain the field-based investigation necessary to determine how groundwater and surface water interact between the development site and Gortacullin Bog NHA, notwithstanding the EIAR's statement that the site lies in hydrological connectivity with the NHA.

Of particular significance is the statutory protection afforded to Gortacullin Bog NHA under **S.I. No. 434/2005**. As identified in the Hydro-G submission, Article 3 prohibits drainage works or water abstraction **affecting the hydrology of the site**, rather than limiting protection to works physically located within the designated boundary. The distinction between Article 3 and Article 4 is material because it recognises that the hydrological functioning of a raised or blanket bog may be influenced by activities occurring beyond the site boundary.

The Applicant's response does not directly engage with this statutory issue. Instead, it proceeds on the basis that hydrological effects cannot occur because of the interpreted groundwater flow regime. However, the Further Information does not present additional field investigations capable of conclusively validating that interpretation.

The Commission should also consider this issue in the context of the wider planning record. Chapter 6 of the EIAR identifies Gortacullin Bog NHA as supporting internationally important blanket bog and wet heath habitats in close proximity to the proposed development. The proximity of a designated peatland ecosystem increases the importance of demonstrating, through complete and site-specific evidence, that excavation, drainage and construction activities will not alter its hydrological regime.



The CLG therefore considers that the Applicant's response amounts to a restatement of the original hydrological conclusions rather than a substantive resolution of the concerns raised in observations.

CLG Conclusion

The Further Information does not satisfactorily demonstrate that the proposed development will have no effect on the hydrology of Gortacullin Bog NHA.

While the Applicant states that the NHA is hydrologically isolated from the proposed works, this conclusion remains disputed by independent expert evidence within the planning record and is not supported by additional site-specific investigations capable of removing that uncertainty.

The Applicant's reliance upon the proposed works being downgradient of the NHA does not establish hydrological isolation. A downgradient excavation or drainage feature may itself influence water levels within hydraulically connected upgradient peat. Similarly, the stated separation distance of approximately 700 m does not establish the absence of an effect unless supported by site-specific evidence demonstrating the actual extent of hydrological influence. No field monitoring of peat water levels has been presented which demonstrates that this distance lies outside the hydrological zone of influence of Gortacullin Bog NHA.

Having regard to the statutory protection afforded to Gortacullin Bog NHA under **S.I. No. 434/2005**, the proximity of the designated peatland to the proposed development, and the continuing disagreement regarding hydrological connectivity, the CLG submits that the Further Information does not resolve the concerns previously raised.

Accordingly, the potential effects of the proposed development on Gortacullin Bog NHA remain a material consideration for the Commission in determining the application.



Response 07 – Cumulative Biodiversity Effects

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.6.9 – *Cumulative Biodiversity Effects*, pp. 34–36.

The Applicant rejects observations that the cumulative ecological effects of the proposed Knockshanvo Wind Farm have been underestimated. The Applicant states that:

- cumulative effects have been assessed in accordance with the *EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* and relevant ecological guidance;
- the assessment considered existing, permitted, under-construction and proposed developments, including the proposed Oatfield Wind Farm;
- cumulative effects were assessed separately for each ecological receptor and each biodiversity discipline;
- following implementation of embedded mitigation and proposed enhancement measures, no significant cumulative residual effects are predicted; and
- accordingly, the conclusions of the EIAR remain unchanged.

Issue

Whether the Further Information adequately demonstrates that the cumulative ecological effects of the proposed development have been comprehensively assessed, particularly having regard to the concentration of existing, permitted and proposed wind energy developments within the East Clare uplands.



CLG Assessment

The Further Information reiterates the Applicant's conclusion that cumulative biodiversity effects have been adequately assessed. However, it provides little additional analysis beyond that contained within the original EIAR and does not satisfactorily address the concerns raised regarding the cumulative interaction of multiple wind energy developments within the receiving environment.

The Applicant's cumulative assessment is primarily structured as a receptor-by-receptor evaluation in which each technical discipline concludes that no significant cumulative residual effects will arise. While this accords with the conventional structure of an EIAR, it does not fully address the broader ecological consequences arising from the progressive industrialisation of a single upland landscape through multiple large-scale wind farm developments.

The East Clare uplands are the subject of several existing, permitted and proposed wind energy developments. The planning record demonstrates that these proposals are not isolated projects but form part of an extensive concentration of wind energy development affecting the same ecological landscape. Consequently, the cumulative assessment must consider not only the additive effects of individual developments but also the interaction of habitat loss, disturbance, fragmentation and hydrological change across the wider ecosystem.

This issue was recognised independently by **Clare County Council**, which expressed concern regarding the cumulative environmental implications arising from multiple wind farm proposals within the area and the absence of a coordinated assessment of their combined effects.

The Applicant's conclusion that cumulative effects are not significant also depends upon the successful implementation of numerous mitigation and enhancement measures across different developments. However, cumulative assessments should not rely upon optimistic assumptions regarding the effectiveness of future mitigation where multiple projects are interacting within the same receiving environment.

Furthermore, several technical submissions within the planning record identify continuing uncertainty regarding cumulative ecological effects, particularly in relation to:

- Hen Harrier;
- Lesser Horseshoe Bat;



- peatland habitats;
- hydrological connectivity;
- habitat fragmentation; and
- long-term habitat restoration.

Those matters are considered individually elsewhere in this submission but are also directly relevant to the robustness of the cumulative biodiversity assessment.

The Applicant has not provided any new ecological evidence within the Further Information demonstrating that the combined effects of Knockshanvo together with Oatfield and other East Clare developments have been reassessed using updated survey information or revised cumulative modelling. Instead, the Further Information largely reaffirms the conclusions previously presented within the EIAR.

The CLG therefore considers that the Further Information does not materially strengthen the cumulative biodiversity assessment or resolve the substantive concerns raised during the planning process.

CLG Conclusion

The Further Information does not satisfactorily address the concerns relating to cumulative biodiversity effects.

While the Applicant confirms that a cumulative assessment has been undertaken, the Further Information largely reiterates the conclusions of the original EIAR without providing additional evidence demonstrating that the cumulative ecological consequences of multiple wind farm developments within the East Clare uplands have been fully evaluated.

Having regard to the concentration of existing and proposed wind energy developments within the area, the concerns identified by Clare County Council, and the continuing uncertainty regarding several sensitive ecological receptors, the CLG submits that the Applicant has not demonstrated that cumulative biodiversity effects will be insignificant.

Accordingly, the Further Information does not resolve the concerns previously raised regarding cumulative ecological impacts, and this remains a material consideration for the Commission in determining the application.



Response 08 – Bird Displacement

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.7.4 – *Bird Displacement*, p. 37.

The Applicant rejects observations that the proposed development will result in significant displacement of bird species from the project area. The Applicant states that:

- bird displacement has been assessed using recognised ornithological survey methods and accepted ecological guidance;
- the predicted displacement distances applied within the assessment are evidence-based and proportionate to the species concerned;
- habitat loss and disturbance have been incorporated into the ecological impact assessment;
- proposed habitat management and enhancement measures will compensate for habitat losses and maintain the conservation status of affected species; and
- the residual effects of displacement, both individually and cumulatively, are not significant.

Issue

Whether the Further Information demonstrates that the displacement effects arising from the proposed development have been adequately assessed, particularly for sensitive upland bird species occupying the wider East Clare landscape.

CLG Assessment

The Further Information largely reiterates the conclusions of the original EIAR and does not provide materially new evidence addressing the concerns raised regarding bird displacement.



The Applicant's assessment is based upon accepted survey methodologies and recognised displacement distances derived from published guidance. While such methodologies are widely used in environmental assessment, they necessarily rely upon assumptions regarding species behaviour and cannot fully predict how individual bird populations will respond to the introduction of nine turbines approaching 185 metres in height together with associated infrastructure.

The central issue is not simply whether individual turbines occupy a relatively small physical footprint, but how individual bird populations will respond to the introduction of nine turbines at Knockshanvo and, cumulatively with the proposed Oatfield Wind Farm, a total of 20 turbines within the same wider upland landscape, with turbines approaching 185 metres in overall height. For species susceptible to displacement or avoidance, the relevant ecological effect may extend well beyond the turbine foundations themselves and include changes in the use and accessibility of otherwise suitable foraging, breeding and commuting habitat. The cumulative assessment must therefore consider the combined displacement effect of both developments across the wider Knockshanvo/Oatfield area, rather than assessing the physical habitat loss associated with each development in isolation.

The Applicant concludes that habitat enhancement measures will compensate for habitat affected by displacement. However, displacement is fundamentally a behavioural response to disturbance rather than simply a function of habitat availability. The creation or restoration of habitat elsewhere does not necessarily ensure that birds displaced from established territories or traditional foraging areas will occupy alternative locations or continue to use the surrounding landscape in the same manner.

This issue is particularly important in relation to upland species whose ecological requirements depend upon extensive, relatively undisturbed areas. The Applicant's conclusion that displacement effects will not be significant is therefore contingent upon assumptions regarding behavioural adaptation and the effectiveness of habitat enhancement measures over time.

The Further Information also continues to assess displacement largely at the project level before concluding that cumulative effects are acceptable. However, the proposed Knockshanvo Wind Farm cannot be considered in isolation. The planning record includes several existing, permitted and proposed wind energy developments within the East Clare uplands, each of which has the potential to contribute incrementally to habitat disturbance and displacement.



This cumulative context is recognised elsewhere within the planning record. Clare County Council identified concerns regarding the cumulative effects of multiple wind energy developments on ecological receptors, while the Applicant itself acknowledges that cumulative assessment is required. The Further Information, however, does not provide a reassessment demonstrating how displacement has been evaluated across the wider landscape using updated information or revised cumulative modelling.

The Commission should also distinguish between the Applicant's conclusion that residual effects are "not significant" and the evidential basis for that conclusion. The Further Information primarily reaffirms the existing assessment rather than presenting new survey data or analysis capable of resolving the uncertainties identified during the consultation process.

Furthermore, displacement cannot be viewed independently of the Applicant's proposed habitat compensation programme. If the effectiveness of the proposed compensation measures remains uncertain, corresponding uncertainty necessarily extends to the assessment of displacement effects.

CLG Conclusion

The Further Information does not satisfactorily resolve the concerns relating to bird displacement.

While the Applicant provides additional explanation regarding the assessment methodology and proposed habitat enhancement measures, the response largely restates the conclusions of the original EIAR without providing substantive new evidence demonstrating that displacement effects have been fully quantified, particularly in the context of multiple wind farm developments within the East Clare uplands.

The CLG therefore submits that the Applicant has not demonstrated that displacement effects, either alone or in combination with other developments, will not give rise to significant ecological consequences.

Accordingly, the Further Information does not adequately address the concerns previously raised regarding bird displacement, and this remains a material consideration for the Commission in determining the application.



Response 09 – Hen Harrier Importance

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.7.6 – *Hen Harrier Importance*, p. 38.

The Applicant rejects observations that the proposed development will have unacceptable effects on the Hen Harrier. The Applicant states that:

- the ecological importance of the site for Hen Harrier has been appropriately characterised through extensive survey work undertaken between 2018 and 2023;
- the utilisation of the site by Hen Harrier has been fully assessed using recognised survey methodologies;
- the collision risk, disturbance and displacement assessments are robust and based upon accepted scientific guidance;
- the project will not adversely affect the conservation status of the species; and
- when considered together with the proposed habitat enhancement and compensation measures, the residual effects are not significant.

Issue

Whether the Further Information demonstrates that the importance of the Knockshanvo uplands for Hen Harrier has been fully understood and that the proposed development will not result in significant adverse effects on this protected species, either individually or cumulatively.

CLG Assessment

The Further Information largely reaffirms the conclusions of the original EIAR and does not materially address the substantive concerns raised by observers regarding the ecological importance of the East Clare uplands for Hen Harrier.

The Applicant's response is principally founded upon the conclusion that survey data demonstrates a level of site utilisation which can be accommodated through mitigation and habitat enhancement. However, the issue raised by the CLG is not confined to



survey methodology or collision risk modelling. Rather, it concerns the ecological function of the wider upland landscape and the cumulative effect of progressive wind energy development on a species that is recognised as being of high conservation concern.

The planning record demonstrates that Hen Harrier has consistently been identified as one of the principal ecological receptors for the proposed development. The EIAR itself includes six years of ornithological surveys and recognises the importance of the species within the wider study area.

Furthermore, **Clare County Council**, in its Chief Executive's Report, identified Hen Harrier as one of the principal environmental issues requiring careful consideration. The Council noted the presence of breeding records within the wider area, acknowledged the potential for significant effects on foraging habitat, and questioned whether the proposed compensation measures had been demonstrated to be effective.

The Applicant's Further Information does not directly engage with those concerns. Instead, it largely reiterates the conclusions already presented within the EIAR.

The CLG also notes that the assessment of significance cannot be confined to the Knockshanvo site in isolation. The proposed development forms part of a wider concentration of existing, permitted and proposed wind farms across the East Clare uplands. The cumulative interaction of habitat loss, disturbance, displacement and reduced habitat availability is therefore of particular importance for a wide-ranging raptor such as the Hen Harrier.

The Applicant concludes that these cumulative effects are not significant. However, that conclusion remains dependent upon assumptions regarding habitat enhancement, behavioural adaptation and the effectiveness of proposed compensation measures. As recognised by Clare County Council, the effectiveness of those measures has not been conclusively demonstrated within the planning record.

The CLG further notes that the Applicant's assessment should be considered alongside the wider ecological evidence contained within the Project, including the original CLG submissions, the Oatfield Further Information response, and the independent ecological observations submitted during both planning processes. Those documents consistently identify uncertainty regarding the long-term cumulative implications for Hen Harrier within the East Clare uplands.

Accordingly, while the Applicant provides further explanation of its assessment, the Further Information does not materially strengthen the evidential basis upon which the conclusion of "no significant residual effect" is reached.



CLG Conclusion

The Further Information does not satisfactorily resolve the concerns relating to the importance of the East Clare uplands for Hen Harrier.

While the Applicant relies upon extensive survey data and accepted assessment methodologies, the response largely reiterates the conclusions of the original EIAR without providing compelling new evidence that the cumulative effects of disturbance, displacement and habitat change have been fully evaluated.

In particular, the Further Information does not adequately address the concerns identified by Clare County Council regarding the effectiveness of the proposed compensation measures, nor does it demonstrate that the cumulative consequences of multiple wind energy developments within the wider landscape have been fully resolved.

Accordingly, the CLG submits that the Applicant has not demonstrated that the proposed development will avoid significant adverse effects on Hen Harrier, and this issue remains a material consideration for the Commission in determining the application.

Response 10 – Hen Harrier Compensation and Enhancement Lands

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.7.7 – *Hen Harrier Compensation and Enhancement Lands*, pp. 38–39.

The Applicant responds to observations concerning the proposed Hen Harrier compensation strategy by stating that:

- the proposed compensation and enhancement lands have been identified following ecological assessment and are suitable for the intended habitat management objectives;



- the proposed measures will improve habitat quality through forestry restructuring, habitat restoration and long-term ecological management;
- the compensation strategy has been designed to offset habitat loss and disturbance associated with the proposed development;
- the lands are capable of being secured and managed for the duration of the project; and
- the proposed compensation package is sufficient to ensure that the residual effects on Hen Harrier are not significant, either alone or cumulatively.

Issue

Whether the Further Information demonstrates that the proposed compensation and enhancement lands are capable of offsetting the predicted impacts of the proposed development on Hen Harrier and whether there is sufficient certainty regarding their effectiveness and long-term delivery.

CLG Assessment

The Further Information provides additional explanation of the proposed compensation strategy but does not materially strengthen the evidential basis for concluding that the predicted impacts on Hen Harrier will be fully offset.

The Applicant's assessment is founded on the premise that habitat enhancement can compensate for the permanent loss or functional disturbance of existing foraging habitat. While habitat enhancement is a recognised mitigation measure, its effectiveness depends upon several assumptions, including the ecological suitability of the proposed lands, the successful implementation of management measures, the timescale over which ecological benefits are realised, and the behavioural response of Hen Harrier to those restored habitats.

The Further Information does not provide new empirical evidence demonstrating that the proposed enhancement lands will achieve equivalent ecological function within a timeframe that avoids adverse effects on the local population. Instead, it relies on the anticipated success of future habitat management.

This distinction is important. Habitat compensation is inherently prospective. It is intended to deliver future ecological gains, whereas the impacts arising from habitat loss and disturbance occur from the commencement of construction and continue



throughout the operational life of the development. The Further Information does not satisfactorily address this temporal gap.

The planning record also contains independent concerns regarding the proposed compensation measures. In its Chief Executive's Report, **Clare County Council** questioned whether the proposed compensation strategy had been demonstrated to be effective for Hen Harrier and identified continuing concerns regarding the long-term consequences for foraging habitat.

The Applicant's response does not directly engage with those concerns. Rather, it reiterates the conclusion that the compensation package is appropriate without providing additional monitoring evidence from comparable schemes demonstrating successful ecological outcomes.

The cumulative context is equally significant. The proposed Knockshanvo Wind Farm forms part of a wider concentration of wind energy developments within the East Clare uplands. Where multiple developments rely upon habitat enhancement as the principal means of mitigating impacts on the same protected species, the Commission must consider whether sufficient evidence exists that the cumulative mitigation strategy is capable of achieving the intended conservation outcomes.

The CLG also notes that the Applicant's compensation proposals should not be considered independently of the broader ecological assessment. Their effectiveness is intrinsically linked to assumptions regarding habitat utilisation, displacement distances, breeding success and cumulative landscape-scale effects. Uncertainty in those underlying assessments necessarily affects confidence in the proposed compensation strategy.

Accordingly, while the Further Information expands upon the proposed management measures, it does not provide compelling evidence that the proposed enhancement lands will fully offset the predicted impacts on Hen Harrier or remove the uncertainty identified during the planning process.

Wider Uncertainty Associated with Biodiversity Compensation

The uncertainty identified above is consistent with the wider peer-reviewed literature concerning biodiversity compensation.

Damiens et al. (2021) note that developments requiring biodiversity offsets can generate long-term or irreversible biodiversity losses, while equivalent gains through restoration may take decades or considerably longer to develop. The authors identify significant



ecological and institutional uncertainty surrounding both the recruitment and long-term retention of compensatory biodiversity gains.

This is directly relevant where the Applicant relies upon future habitat restoration and enhancement to counterbalance immediate or continuing habitat loss and displacement. The ecological value of the impacted habitat is lost or reduced when the development occurs, whereas the ecological benefit attributed to compensation may depend upon successful restoration, management and monitoring over a substantially longer period.

The Commission should therefore be cautious about treating hectares of proposed compensation or enhancement as automatically equivalent to hectares of functioning habitat lost or rendered less available. The relevant question is whether equivalent ecological function will be delivered, at the necessary time, and maintained for at least as long as the impact persists.

Avoidance Before Compensation

Recent peer-reviewed literature also emphasises the importance of preventing ecological loss rather than assuming that restoration can subsequently recreate equivalent environmental conditions.

Locke et al. (2026), in addressing the emerging “Nature Positive” framework, identify prevention of the loss of intact ecosystems, natural processes and species assemblages as a primary conservation priority, noting that such systems may be irreplaceable or incapable of being restored within the timescales relevant to current biodiversity objectives.

This is relevant to the present proposal because compensation and enhancement should not be treated as equivalent to avoidance. Where impacts can be avoided or reduced through project design, that remains preferable to accepting habitat loss and relying upon future restoration or management to compensate for it.

Accordingly, the Applicant's compensation and enhancement proposals should be considered only after the Commission is satisfied that impacts have first been avoided and minimised to the greatest practicable extent and that any residual loss has been conservatively and reliably quantified.



CLG Conclusion

The Further Information does not satisfactorily resolve the concerns regarding the proposed Hen Harrier compensation and enhancement lands.

The Applicant continues to rely upon future habitat management as the principal mechanism for mitigating habitat loss and disturbance. However, the Further Information does not demonstrate, through robust site-specific evidence or proven ecological outcomes, that the proposed compensation measures will achieve the intended conservation benefits within an appropriate timeframe.

Having regard to the concerns identified by Clare County Council, the cumulative context of multiple wind energy developments within the East Clare uplands, and the continuing uncertainty regarding the effectiveness of the proposed compensation measures, the CLG submits that the Applicant has not demonstrated that the residual effects on Hen Harrier will be insignificant.

Accordingly, the Further Information does not adequately address the concerns previously raised, and the proposed compensation strategy remains a material consideration for the Commission in determining the application.

Response 11 – Hydrology and Hydrogeology

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.10 – *Hydrology and Hydrogeology*, p. 42, together with the detailed response prepared by Hydro-Environmental Services (HES) contained in Appendix 2 of FI-2.

The Applicant responds to observations concerning hydrology and hydrogeology by stating that:

- the baseline hydrological and hydrogeological investigations are comprehensive and proportionate to the proposed development;



- the conceptual site model is supported by groundwater monitoring, surface water monitoring, geological mapping and field investigations;
- appropriate Source–Pathway–Receptor (SPR) assessments have been undertaken for all identified receptors;
- embedded design measures, drainage controls and the Construction Environmental Management Plan will prevent adverse effects on groundwater, surface water and downstream receptors;
- the proposed development will not result in deterioration in Water Framework Directive water bodies; and
- no significant residual hydrological or hydrogeological effects are predicted following implementation of the proposed mitigation measures.

Issue

Whether the Further Information adequately demonstrates that the hydrological and hydrogeological baseline is sufficiently robust to support the conclusions reached in the EIAR and whether the Applicant has demonstrated that significant effects on groundwater, surface water and dependent ecological receptors can be excluded.

CLG Assessment

The Further Information expands upon the Applicant's original hydrological assessment but does not satisfactorily resolve the substantive concerns raised by the CLG and by the independent Hydro-G review.

The Applicant's response is founded upon the conclusion that the existing field investigations are sufficient to characterise the site's hydrology and hydrogeology. However, this conclusion is directly disputed within the planning record.

The Hydro-G submissions conclude that the Applicant has not undertaken sufficient site-specific investigation to confidently characterise groundwater movement, groundwater-surface water interaction or the hydrological functioning of the peatland environment. In particular, concerns are raised regarding the absence of a sufficiently



detailed hydrogeological investigation, the limited groundwater monitoring network and the reliance placed upon conceptual interpretations of groundwater flow.

The Applicant's response does not materially address these criticisms by providing additional field investigation or monitoring data. Instead, it primarily explains why the Applicant considers the existing dataset to be adequate.

The CLG also notes that the Applicant's conclusions are intrinsically linked to several other technical disciplines within the application. The conclusions reached in respect of:

- peat stability;
- peat and spoil management;
- Gortacullin Bog NHA;
- groundwater-dependent habitats;
- private water supplies; and
- Water Framework Directive compliance,

all depend upon the accuracy of the underlying conceptual hydrogeological model.

Consequently, uncertainty regarding the hydrological baseline extends beyond Chapter 9 of the EIAR and affects the robustness of several other environmental assessments.

The Applicant also relies extensively upon mitigation measures, including drainage controls, settlement ponds, buffer zones, water quality monitoring and construction management procedures. While such measures are recognised elements of good environmental practice, they do not remove the need to first demonstrate that the baseline understanding of the receiving environment is sufficiently robust.

The Commission should distinguish between mitigation designed to reduce identified risks and uncertainty regarding the existence or extent of those risks. Where the baseline itself remains contested, confidence in the effectiveness of subsequent mitigation is necessarily reduced.

The Applicant further concludes that there will be no deterioration of Water Framework Directive water bodies. However, this conclusion remains dependent upon assumptions regarding groundwater pathways, runoff generation, peat behaviour and sediment transport, all of which are disputed elsewhere in the planning record.

The CLG also notes that the proposed development is located within an environmentally sensitive upland catchment characterised by extensive peat deposits, numerous



drainage pathways and hydrologically connected ecological receptors. In such circumstances, the evidential standard required to demonstrate the absence of significant effects is necessarily high.

The Further Information does not provide materially new site investigation capable of resolving the scientific uncertainty identified by the independent hydrogeological review. Rather, it reinforces the Applicant's original interpretation of the available data.

CLG Conclusion

The Further Information does not satisfactorily resolve the concerns relating to hydrology and hydrogeology.

While the Applicant provides a more detailed explanation of the existing assessment methodology, the response does not materially strengthen the evidential basis upon which the conclusions of the EIAR are founded. Significant uncertainty remains regarding the adequacy of the baseline hydrogeological investigation, the conceptual groundwater model and the interaction between hydrology, peatland function and sensitive ecological receptors.

Given the central importance of hydrology to the assessment of peat stability, designated habitats, private water supplies and Water Framework Directive compliance, these uncertainties are material to the Commission's assessment of the application.

Accordingly, the CLG submits that the Further Information does not adequately address the concerns previously raised regarding hydrology and hydrogeology, and these matters remain material considerations in determining the proposed development.



Response 12 – Peat Stability and Landslide Risk

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.11 – *Peat Stability*, pp. 42–43.

The Applicant responds to concerns regarding peat stability during construction by relying on the **Geotechnical and Peat Stability Assessment contained in Appendix 8-1 of the EIAR**. The Applicant states that the assessment demonstrates that the Wind Farm Site has an “**acceptable margin of safety**”, is suitable for wind farm development and is considered to be at **low risk of peat failure**.

The Applicant further states that a number of control measures are prescribed in the Peat Stability Assessment and that all such measures will be implemented in full. It also relies on measures to prevent soil and subsoil erosion during excavation, reinstatement and long-term storage.

The Applicant concludes that an assessment has been undertaken for the construction, operational and decommissioning phases, including cumulative assessment, and that, subject to implementation of the prescribed mitigation measures, “**no significant effects on peat stability are anticipated during the construction period as a result of the Proposed Development.**”

Issue

Whether the Applicant's reliance on the Geotechnical and Peat Stability Assessment, together with construction controls and mitigation measures, provides a sufficiently robust evidential basis for concluding that the proposed development presents a low risk of peat failure and that significant effects associated with peat instability can be excluded.



CLG Assessment

The Further Information does not introduce a new peat stability assessment or additional substantive site investigation in response to the concerns raised. Rather, it relies upon the original Geotechnical and Peat Stability Assessment and reiterates its conclusion that the site has an acceptable margin of safety.

The significance of this issue should be considered in the context of the scale of disturbance proposed. Chapter 4 of the EIAR identifies approximately **81,500 m³ of peat and 129,600 m³ of non-peat spoil**, giving a combined total of approximately **211,100 m³ of peat and spoil requiring management**. This arises from turbine and hardstand excavations, access roads, construction compounds, the substation, meteorological mast, five borrow pits and the grid connection. The EIAR further proposes that excavated peat and overburden will be used in the reinstatement of borrow pits.

The Commission is therefore not considering isolated or minor works within peat. The proposal involves extensive excavation, movement, temporary handling and permanent placement of peat and spoil across an upland site.

The Applicant's Peat Stability Assessment applies both deterministic factor-of-safety calculations and qualitative considerations. For long-term drained conditions, the assessment models groundwater conditions through a sensitivity analysis in which water levels are varied from 0% to 100% of peat depth. The report states that this approach is intended to account for intense rainfall and extreme dry events.

While this is an established geotechnical assessment approach, the calculated factor of safety remains dependent upon the assumptions and parameters incorporated into the model. It does not remove the importance of accurately understanding actual groundwater conditions, peat properties and hydrological behaviour across the development footprint.

This is particularly relevant because the independent Hydro-G evidence within the planning record raises concerns regarding the adequacy of the hydrological and hydrogeological baseline investigation. Those concerns are material to peat stability because groundwater level and pore-water conditions are fundamental parameters affecting the stability of peat slopes.

The interdependence between the hydrological assessment and peat stability assessment is therefore important. The Applicant cannot rely exclusively upon calculated factors of safety without the Commission also being satisfied that the



hydrological assumptions underpinning those calculations are sufficiently representative of site conditions.

The EIAR itself recognises the potential consequences of peat instability. Chapter 16 expressly refers to the **12 November 2020 peat failure at Meenbog Wind Farm**, which occurred during construction of a floating access road in an area of very weak peat upslope of the road under construction. The Applicant states that lessons from that event have informed the Knockshanvo assessment.

That precedent is directly relevant because it demonstrates that peat instability can arise during the construction phase as a consequence of interaction between peat conditions and construction activities. It reinforces the need for the Commission to be satisfied that risks have been avoided through site selection and design rather than relying primarily upon construction-stage monitoring and control measures.

A further concern is the extent to which the Applicant's conclusion is conditional. The Peat Stability Assessment concludes that the site is at low risk of peat failure **“providing appropriate mitigation measures and construction controls are implemented.”** The Further Information similarly states that all detailed control measures will be implemented.

This is not equivalent to demonstrating an inherently negligible risk. It confirms that the Applicant's assessment of acceptability depends materially upon successful implementation of future construction controls.

The effectiveness of those controls must also be considered together with the Peat and Spoil Management Plan. Large quantities of excavated peat will require handling and placement, including within borrow pits. Accordingly, peat stability cannot reasonably be assessed solely by reference to the undisturbed slopes on which infrastructure is proposed; consideration must also be given to the stability and hydrological behaviour of excavated and reinstated material throughout construction and thereafter.

The Applicant states that cumulative assessment has been completed, but Section 3.1.11 does not provide any substantive explanation of the cumulative peat stability assessment or demonstrate how the interaction with other major wind farm development within the same upland environment alters the risk assessment.

The CLG therefore considers that the Further Information primarily restates the original conclusion rather than resolving the underlying concerns regarding the interaction between peat stability, groundwater conditions, extensive excavation and the effectiveness of construction-stage controls.



CLG Conclusion

The Further Information does not satisfactorily resolve the concerns regarding peat stability and landslide risk.

The Applicant has undertaken a dedicated Geotechnical and Peat Stability Assessment and that the assessment incorporates intrusive ground investigation, factor-of-safety analysis and specified construction controls. However, the conclusion that the site is at low risk of peat failure remains expressly dependent upon the assumptions underpinning the assessment and the successful implementation of future mitigation and construction controls.

This is material in circumstances where approximately **211,100 m³ of peat and spoil requires management**, where substantial infrastructure is proposed within an upland peat environment, and where independent expert evidence raises unresolved concerns regarding the adequacy of the hydrological and hydrogeological baseline.

The Applicant's own reference to the Meenbog peat failure further demonstrates that construction activity on peatland can result in significant instability notwithstanding pre-construction assessment and engineering controls.

Accordingly, the CLG submits that the Applicant's reiteration of an “acceptable margin of safety” does not, of itself, provide sufficient certainty that significant peat instability can be excluded. The Commission should therefore treat the residual uncertainty concerning peat stability, hydrological conditions and the management of excavated peat as a material consideration in determining the application.

Response 13 – Noise and Vibration

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.12 – *Noise and Vibration*, p. 43, together with the detailed AWN Consulting response contained in Appendix 3 of FI-2.



The Applicant states that the noise issues raised in observations have been addressed by AWN Consulting, the acoustic consultants who prepared Chapter 12 of the EIAR. The matters identified for further response include:

- background noise measurements and analysis;
- impacts on the Sunyata Buddhist Retreat Centre;
- identification of Noise Sensitive Locations (NSLs);
- low-frequency noise and infrasound;
- the effect of land contours on noise propagation; and
- noise levels downwind of wind turbines.

The Applicant maintains that the EIAR noise assessment is “robust” and “comprehensive”, has been undertaken in accordance with current standards and best-practice guidance, and demonstrates that the proposed development can be constructed and operated within the applicable noise criteria.

AWN's detailed response states that the assessment has been undertaken principally by reference to the **Wind Energy Development Guidelines for Planning Authorities (2006)**, **ETSU-R-97**, and the Institute of Acoustics' 2013 Good Practice Guide. AWN acknowledges that both Clare County Council and the National Environmental Health Service raised the relevance of the **WHO Environmental Noise Guidelines for the European Region (2018)** but maintains the assessment approach adopted in the EIAR.

Issue

Whether the Further Information satisfactorily addresses the substantive concerns raised regarding the adequacy of the operational noise assessment and whether reliance on the 2006 Wind Energy Development Guidelines and ETSU-R-97 provides a sufficiently robust basis for assessing the potential noise effects of modern large-scale turbines in the particular receiving environment at Knockshanvo.



CLG Assessment

The Further Information provides a substantial technical response from AWN but does not alter the fundamental assessment framework used in Chapter 12 of the EIAR. The Applicant continues to rely principally upon the 2006 Wind Energy Development Guidelines and ETSU-R-97 and concludes that compliance with the noise limits derived under that framework demonstrates that the proposed development is environmentally acceptable.

The CLG accepts that the 2006 Guidelines remain the extant statutory planning guidance applicable to wind energy development. However, compliance with numerical limits derived from those Guidelines is not, of itself, determinative of whether unacceptable effects on residential amenity or human health may arise.

This issue is particularly material because **Clare County Council expressly questioned whether the WHO Environmental Noise Guidelines for the European Region (2018) may provide a more appropriate basis for consideration**, having regard to the number of noise-sensitive receptors and the changes in turbine technology and design since publication of the 2006 Guidelines. AWN itself records this concern in its Further Information response.

The **National Environmental Health Service (NEHS)** similarly advised that the WHO 2018 Guidelines should be considered when assessing the significance of predicted noise, describing those guidelines as establishing health-protection levels for environmental noise.

These observations are significant. They demonstrate that concerns regarding the assessment framework are not confined to third-party objectors but have also been raised by the Planning Authority and the statutory environmental health service.

The Applicant's response does not undertake a parallel assessment demonstrating the consequences of applying the WHO 2018 recommendations to the proposed development. Instead, it explains why AWN considers the existing assessment methodology appropriate. Consequently, the Commission is not provided with a direct comparison demonstrating whether the conclusions would differ if the more recent WHO health-based guidance were applied.



The age of the principal Irish guidance is also material in the circumstances of this application. The 2006 Guidelines were prepared in the context of a materially different generation of wind turbine development. The Knockshanvo proposal comprises turbines with tip heights of up to approximately **185 metres** and rotor diameters of up to approximately **163 metres**. The scale and generating characteristics of such turbines are substantially different from the turbine technology prevalent when the Guidelines were prepared.

The CLG is not suggesting that turbine height alone establishes greater noise effects. Rather, it reinforces the importance of ensuring that the assessment methodology adequately addresses the acoustic characteristics of the particular turbines proposed and the characteristics of the receiving environment rather than treating compliance with historic numerical criteria as determinative.

The Further Information also identifies several site-specific issues requiring separate technical consideration, including background noise measurements, the Sunyata Buddhist Retreat Centre, low-frequency noise and infrasound, terrain effects and downwind propagation. These matters are sufficiently substantive that AWN has provided a dedicated technical appendix to address them.

Of particular relevance is the character of the receiving environment. Knockshanvo is an upland rural area with noise-sensitive residential receptors and the Sunyata Buddhist Centre, for which tranquillity and low ambient noise form an important component of the existing environment. Assessment solely against maximum permissible noise limits does not necessarily capture the magnitude of change experienced at receptors where existing background sound levels are particularly low.

The Commission should also have regard to the cumulative context. The noise environment cannot be assessed solely by reference to Knockshanvo where other existing, permitted or proposed wind farms may contribute simultaneously to operational noise at the same receptors. AWN states that cumulative impacts have been modelled; however, the acceptability of that assessment remains dependent upon the underlying background-noise methodology, receptor selection, turbine sound-power assumptions and propagation modelling.

The wider planning record also now contains a relevant development since the original EIAR was prepared. In **Webster & Anor v Meenacloghspar (Wind) Ltd [2025] IEHC 300**, the High Court addressed actionable nuisance arising from operational wind turbine



noise. The significance of that judgment for the present application is not that it establishes a new planning noise limit or that the circumstances are identical to Knockshanvo. Rather, it demonstrates that compliance with the planning regime does not necessarily establish that actual operational turbine noise cannot materially interfere with the use and enjoyment of residential property.

The CLG relied upon this development in its Oatfield Further Information submission. It reinforces the need for a precautionary and receptor-specific assessment of operational noise rather than reliance solely upon predicted compliance with numerical criteria.

Accordingly, while the AWN response provides useful clarification of the Applicant's methodology, it does not remove the substantive concerns arising from the age of the principal assessment guidance, the contrary observations of Clare County Council and the NEHS, the particular sensitivity of the receiving environment, and the cumulative operational context.

CLG Conclusion

The Further Information does not satisfactorily resolve the concerns regarding operational noise.

The Applicant has demonstrated that the noise assessment has been undertaken in accordance with the **2006 Wind Energy Development Guidelines**, ETSU-R-97 and associated acoustic guidance. However, that does not resolve the wider question of whether those criteria provide a sufficiently protective assessment framework for the proposed development in its particular receiving environment.

Both **Clare County Council and the National Environmental Health Service have expressly raised the relevance of the WHO Environmental Noise Guidelines 2018**, yet the Applicant has not provided an equivalent assessment demonstrating the implications of applying those more recent health-based recommendations.

The CLG therefore submits that predicted compliance with the noise limits adopted by the Applicant should not, in itself, be regarded as establishing that unacceptable effects on residential amenity and sensitive receptors will not occur.

Having regard to the scale of the proposed turbines, the rural background noise environment, the presence of particularly sensitive receptors, the cumulative wind



energy context and the concerns raised by statutory and local authority consultees, the adequacy of the operational noise assessment remains a material consideration for the Commission.

Response 14 – Residential Visual Amenity

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.13.2 – *Visual Effects on Residential Receptors*, pp. 45–51.

The Applicant responds in detail to concerns regarding the visual effects of the proposed turbines on surrounding residences. It states that the LVIA identified residential receptors as among the receptors with the greatest potential to be affected and that residential visual amenity was specifically considered during site selection and throughout the iterative design process.

The Applicant states that it is neither feasible nor required under best-practice LVIA guidance to undertake an individual visual impact assessment for every residence. Instead, the assessment considered the distribution, layout and orientation of dwellings and used representative viewpoints, photomontages and photowires to assess residential effects.

The Applicant relies in particular upon:

- a minimum turbine setback of more than **750 metres**, exceeding four times the maximum 185 m turbine tip height (740 m);
- the relatively low population density of the receiving landscape;
- the undulating topography and mature vegetation which it states will screen or restrict views from many residences;
- the arrangement of the turbines into three clusters;



- the absence, in the Applicant's assessment, of unacceptable “surrounding” effects whereby residences would experience turbines in multiple directions; and
- the reduction of the original design from 18 turbines to nine turbines as mitigation by design.

The Applicant nevertheless acknowledges that significant effects will occur at certain residential receptors. The underlying LVIA identifies, for example, a **High sensitivity**, **Substantial magnitude of change** and **Long-term Significant residual visual effect** at VP13, representative of two residential properties approximately 800 m from the Central Cluster.

The Applicant's overall position remains that significant residential visual effects will be highly localised, affecting only a small number of receptors close to the turbines, and that the development will not result in unacceptable residential visual amenity effects.

Issue

Whether compliance with setback distances, representative viewpoint assessment and the Applicant's reliance upon topographical and vegetative screening adequately address the significant and long-term visual effects that will arise at residential properties in close proximity to turbines of up to 185 m tip height, including the potential cumulative and surrounding effects arising with other wind energy development.

CLG Assessment

The Further Information provides a detailed defence of the LVIA methodology but does not alter the central fact that the Applicant's own assessment identifies **Significant, long-term visual effects at residential receptors**.

This distinction is important. The issue before the Commission is not simply whether the Applicant followed an accepted LVIA methodology. It is whether the actual effects identified through that methodology are acceptable in planning terms.

The Applicant places substantial weight on the fact that all turbines are located more than 750 m from residential receptors and therefore exceed both the 500 m separation referred to in the 2006 Wind Energy Development Guidelines and four times the



proposed maximum turbine height referred to in the 2019 Draft Revised Wind Energy Development Guidelines.

However, a setback distance is principally a siting parameter. Compliance with that distance does not establish that unacceptable visual effects cannot occur. Indeed, the Applicant's own assessment demonstrates precisely this point: notwithstanding the setback, VP13 is assessed as experiencing a **Substantial magnitude of change and a Long-term Significant residual visual effect**.

The Applicant therefore cannot reasonably rely upon compliance with the four-times-tip-height distance as evidence that residential visual amenity has been satisfactorily protected where its own LVIA identifies significant effects beyond that distance.

The reliance placed upon low population density also warrants caution. The fact that fewer people live within the immediate upland environment may affect the number of receptors experiencing an effect; it does not reduce the magnitude of the effect experienced by an individual residential receptor. The planning assessment must protect the residential amenity of existing communities irrespective of whether the surrounding electoral divisions have population densities below county or national averages.

Similarly, the Applicant places significant reliance upon existing vegetation as a screening mechanism. The LVIA identifies mature boundary vegetation and roadside vegetation as factors restricting views from residences. However, vegetation is inherently variable. Its screening effectiveness changes seasonally and over time through growth, removal, disease, forestry operations and normal land management. In a proposal with a **35-year operational life**, existing vegetation cannot be treated as equivalent to permanent topographical screening.

This issue is particularly relevant in a landscape substantially characterised by commercial forestry. Forestry is a rotational land use and cannot reasonably be assumed to provide unchanged screening throughout the operational lifetime of the development.

The Applicant also argues that assessment of every individual residence would be disproportionate and that representative viewpoints are consistent with GLVIA3. The CLG accepts that GLVIA3 permits the use of representative viewpoints and does not require a photomontage from every dwelling. The concern is therefore not that every residence must automatically have an individual photomontage.



Rather, the question is whether the selected viewpoints adequately represent the **worst-case residential experience**, particularly within the closest residential clusters and where the three Knockshanvo turbine clusters and other proposed wind farms may be visible in different directions.

The Applicant itself acknowledges that residential receptors were among those with the greatest potential to be adversely affected. Chapter 14 identifies **16 residential receptors within 1 km** of the proposed turbine locations, with the closest located slightly more than 750 m from a turbine. In those circumstances, the adequacy and representativeness of the residential visual assessment is a substantive planning consideration rather than merely a methodological issue.

The Applicant's conclusion regarding the absence of “surrounding” effects also requires consideration in the wider cumulative context. The term is defined by the Applicant as circumstances where residential receptors may feel surrounded by developments where two or more wind farms are located in visual proximity. This is particularly relevant at Knockshanvo because the proposed Oatfield Wind Farm occupies the same wider upland landscape.

The Applicant concludes that intervening topography and vegetation prevent significant surrounding effects. However, this conclusion is dependent upon the precise orientation of receptors, visibility from representative viewpoints and the continued screening provided by vegetation. It must therefore be considered alongside the separate cumulative landscape and visual assessment rather than accepted solely on the basis of the design rationale.

The concerns regarding visual effects are also supported independently within the planning record. **Clare County Council**, while recognising the site's location within an area identified for wind energy development, identified significant landscape and visual concerns and considered that the landscape character would be substantially altered by development of this scale. The Council also raised concerns regarding the wider cumulative development of the East Clare uplands.

The Applicant's Further Information does not remove those concerns. Instead, it essentially argues that significant visual effects are sufficiently localised and affect a sufficiently small number of receptors that the overall development remains acceptable.

The CLG does not consider that this follows automatically from the evidence. A significant long-term effect upon a relatively small number of residential receptors



remains a significant planning effect and must be weighed accordingly by the Commission.

CLG Conclusion

The Further Information does not satisfactorily resolve the concerns regarding residential visual amenity.

The Applicant states that they have reduced the turbine layout from 18 to nine turbines and has provided setbacks exceeding 750 m from residential receptors. However, those measures have **not eliminated significant residential visual effects**. The Applicant's own LVIA identifies a **Long-term Significant residual visual effect** at residential receptors represented by VP13, notwithstanding compliance with the stated setback criteria.

The Applicant's reliance upon low population density does not reduce the significance of the effect experienced by individual households, while reliance upon vegetation as long-term screening must be treated cautiously over a 35-year operational period.

Accordingly, the Commission should assess residential visual amenity by reference to the actual magnitude, duration and cumulative character of the effects identified, rather than treating compliance with minimum setback distances or the limited number of affected receptors as demonstrating acceptability.

The CLG submits that significant and long-term effects on residential visual amenity remain unresolved and constitute a material consideration in the determination of the application.



Response 15 – Landscape Sensitivity and Alteration of the Landscape

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.13.3 – *Sensitivity and Alteration of the Landscape*, pp. 51–54.

The Applicant responds to observations that the proposed development would be located within a sensitive upland landscape, would adversely affect areas of high scenic amenity and would introduce turbines of an inappropriate scale onto prominent hills.

The Applicant states that the proposed development has a **35-year operational life**, which is classified as “Long-Term” rather than permanent under the EPA Guidelines, and that the effects are reversible because the turbines will ultimately be decommissioned.

In relation to landscape sensitivity, the Applicant relies principally upon the site's location within **Landscape Character Area 8 – Slieve Bernagh Uplands** and the Clare Wind Energy Strategy (CWES). It states that this LCA has the lowest sensitivity classification to wind energy development identified in Table 4a of the CWES and that eight of the nine turbines are located within a “Strategic Area”, with the remaining turbine located within an area designated “Acceptable in Principle”.

The Applicant further states that:

- the Wind Farm Site is predominantly a modified working landscape characterised by commercial forestry;
- the site is therefore of **Low landscape sensitivity**;
- the large-scale upland landscape has the capacity to accommodate wind energy development;
- the proposed turbines are located in a sparsely settled landscape;
- topography, ridgelines and vegetation limit visual exposure;
- no Clare County Development Plan “Heritage Landscape” occurs within approximately 6.5 km of the Wind Farm Site;
- significant effects on Heritage Landscapes are not predicted; and
- Scenic Routes SR25 and SR26 will experience limited effects because roadside vegetation, topography and the orientation of views restrict visibility, while their



principal panoramic views are generally directed westwards and north-westwards.

The Applicant therefore maintains that the site is appropriately located for wind energy development and that the proposed turbines will not result in an unacceptable alteration of landscape character or scenic amenity.

Issue

Whether the Applicant's classification of the Wind Farm Site as a **Low sensitivity landscape**, and its consequent conclusion that the Slieve Bernagh uplands have sufficient capacity to accommodate nine turbines of up to approximately 185 m tip height, adequately reflects the intrinsic landscape character, scenic qualities, recreational value and scale of change arising from the proposed development.

CLG Assessment

The Applicant's response depends substantially upon equating the site's wind energy policy designation with its landscape sensitivity. That approach requires careful scrutiny.

There is no dispute that the Clare Wind Energy Strategy identifies substantial parts of the Wind Farm Site as a Strategic Area for wind energy development. That designation is an important material consideration. However, identification of an area as strategically suitable for wind energy development does not mean that every development, irrespective of turbine scale, layout or cumulative context, is environmentally acceptable.

The Applicant's own EIAR demonstrates the distinction between **landscape character** and **wind energy policy designation**.

The Clare County Landscape Character Assessment describes the Slieve Bernagh Uplands as having characteristics including:

- “Remote and isolated with panoramic views afforded to Lough Derg, lower drumlin farmland and Shannon estuary”
- and identifies vegetation comprising heather moorland, plantation forestry and semi-natural woodland.



The Applicant's Chapter 14 acknowledges that application of the underlying County Landscape Character Assessment could result in a **medium landscape sensitivity** classification for LCA 8. It then reduces this classification on the basis that the subsequent Clare Wind Energy Strategy designates the area as strategically suitable for wind development.

This is a material methodological point. A policy designation identifying an area as suitable for consideration of wind energy development does not physically alter the characteristics of the landscape or automatically reduce its susceptibility to change.

Indeed, the Applicant's own LVIA methodology states that landscape sensitivity comprises both **landscape value and susceptibility to change**, with susceptibility defined as the ability of the landscape to accommodate the proposed turbines without undue consequences for its existing character or the objectives of landscape planning policy.

The assessment should therefore consider the capacity of this particular landscape to accommodate **this particular development**.

That distinction assumes additional importance because the turbine dimensions now proposed are substantially greater than those prevalent when the Clare Wind Energy Strategy and the underlying landscape assessments were prepared.

The proposed turbines would reach approximately **185 m tip height**, with rotor diameters of up to approximately 163 m. These would constitute exceptionally large vertical structures within an upland landscape whose character derives partly from its rolling landform, remoteness and panoramic views.

The Applicant relies upon the 2006 Wind Energy Development Guidelines' treatment of "Mountain Moorland" landscapes as potentially suitable for large-scale turbines. However, those same Guidelines recognise that mountain moorland may be inappropriate for wind energy development where landscapes possess rare scenic quality or comprise relatively pristine, unspoilt and remote areas. The Applicant's own EIAR reproduces this qualification.

Accordingly, classification as "Mountain Moorland" cannot itself establish landscape capacity.

It is also important to note that the geographical location of the proposed Knockshanvo and Oatfield Wind Farms are not in fact on the main Slieve Bernagh range but on the adjacent but much lower "12 O'Clock Hills" or "Knockanuarha Hills". This is a significant point since these uplands are less remote, more densely populated and at a significantly



lower elevation than the main Slieve Bernagh range (highest point 309m compared to Moylussa on the main range at 532m). The visual impact of 185m tall turbines will therefore be all the greater. References to "the Slieve Bernagh range" or the "Slieve Bernagh uplands" throughout the Applicant's Further Information should be read accordingly.

The Applicant also places considerable weight upon commercial forestry in characterising the Wind Farm Site as a "modified working landscape". Commercial forestry is undoubtedly a significant component of the existing landscape. However, forestry does not remove the underlying upland topography, landscape scale, remoteness, recreational function or panoramic relationship between the Slieve Bernagh uplands and the surrounding valleys and settlements.

This is particularly relevant because the **East Clare Way and 12 O'Clock Hills walking routes pass directly through the Proposed Development Site**. The EIAR acknowledges the recreational value associated with these routes but reduces the site's landscape value partly because those trails presently traverse commercial forestry.

The CLG considers that this approach understates the significance of the landscape as experienced by recreational users. The value of an upland walking route is not determined solely by the immediate landcover through which individual sections pass. Its value also derives from elevation, remoteness, landscape setting, views and the experience of moving through the wider upland environment.

The Applicant's treatment of the development as "reversible" also requires qualification. It is technically correct that turbines can be removed following decommissioning and that a 35-year operational period falls within the EPA definition of a "Long-Term" rather than permanent effect. However, a 35-year alteration to landscape character represents a substantial period in planning terms and encompasses a significant proportion of the lifetime experience of existing residents and recreational users. The fact that turbines may ultimately be removed does not diminish the significance of landscape effects during their operational lifetime.

The Applicant's response concerning Heritage Landscapes is similarly narrow. The fact that no formally designated Heritage Landscape lies within 6.5 km of the turbines does not establish that the development will have no significant effect on landscape character generally. Landscape and visual effects are not confined to formally designated landscapes.

The EIAR itself assesses the Fergus Estuary and River Shannon Heritage Landscape as **High sensitivity** and predicts a **Long-Term Moderate landscape effect** in parts of that designated landscape.



The concerns regarding landscape capacity are also supported independently within the planning record. Clare County Council recognised the site's wind energy designation but nevertheless identified substantial landscape and visual concerns, including the scale of contemporary turbines compared with those envisaged when the existing Wind Energy Strategy was formulated.

This is a particularly relevant consideration. Strategic support for wind energy development does not dispense with the requirement to determine whether the specific scale and configuration proposed can be satisfactorily accommodated within the receiving landscape.

The CLG therefore considers that the Applicant's conclusion of **Low landscape sensitivity** is materially influenced by wind energy zoning and existing commercial forestry and does not give sufficient weight to the intrinsic characteristics of the Slieve Bernagh uplands, their recreational function, panoramic setting and susceptibility to development of the scale now proposed.

CLG Conclusion

The Further Information does not satisfactorily resolve the concerns regarding landscape sensitivity and alteration of landscape character.

The CLG accepts that the majority of the proposed development lies within an area identified in the Clare Wind Energy Strategy as strategically suitable for wind energy development. However, that policy designation does not amount to a determination that the landscape is inherently of Low sensitivity or that it possesses unlimited capacity to accommodate turbines of any scale.

The Applicant's own evidence acknowledges the remote and isolated character of the Slieve Bernagh uplands, their panoramic views, recreational use and the fact that the underlying Clare Landscape Character Assessment could support a **medium sensitivity** classification. The reduction to Low sensitivity is materially influenced by the subsequent wind energy policy designation.

The Commission should therefore distinguish between **strategic policy support for wind energy in principle** and the **landscape capacity of this particular location to accommodate nine turbines approaching 185 m in height**, particularly when considered in the wider cumulative development context.



Accordingly, the CLG submits that the Applicant has not demonstrated that the scale of landscape change arising from the proposed development is acceptable merely because the site is located within a Strategic Area for wind energy development. The significant alteration of the character and experience of the Slieve Bernagh uplands remains a material planning consideration in the determination of the application.

Response 16 – Cumulative Landscape and Visual Effects

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.13.4 – *Cumulative Impacts*, pp. 54–57.

The Applicant rejects observations that the Landscape and Visual Impact Assessment inadequately assess cumulative effects arising from the concentration of wind energy development within the East Clare uplands.

The Applicant states that the LVIA contains a comprehensive cumulative assessment comprising cumulative context and ZTV mapping, Landscape Character Area assessment tables, cumulative photomontage assessment tables, a cumulative landscape effects assessment and a cumulative visual effects assessment. Seven existing, permitted and proposed wind energy developments within the 20 km LVIA study area were considered.

The Applicant relies particularly upon the characteristics of the Slieve Bernagh Uplands LCA, stating that setback distances between projects, narrow valleys and prominent landforms create relatively small and separate visual units and give the landscape the capacity to accommodate multiple wind energy developments. It therefore considers the cumulative effects on landscape character to be acceptable.

Particular attention is given to the proposed **Oatfield Wind Farm**, comprising 11 turbines and located approximately **500 m from the nearest proposed Knockshanvo turbine**. The Applicant describes the combined Knockshanvo/Oatfield scenario as an uncertain future receiving environment because Oatfield remains dependent upon the



outcome of its separate consenting process. Nevertheless, Oatfield is assessed cumulatively at 14 of the 15 relevant Knockshanvo viewpoints.

The underlying LVIA acknowledges that Oatfield is located within the **same area of upland landscape** as Knockshanvo and would therefore be viewed within the **same visual unit**. It further acknowledges that Oatfield would increase the density of turbines on the elevated ridgelines around the Knockshanvo Central and Western Clusters and that cumulative landscape effects would arise where the two developments are visible together, which the Applicant states would occur from most receptors in the surrounding landscape.

Notwithstanding this, the Applicant concludes that the large-scale and undulating character of the uplands can accommodate both developments and that the proposed Knockshanvo Wind Farm will not result in significant cumulative or in-combination landscape and visual effects.

Issue

Whether the Applicant has demonstrated that the combined landscape and visual effects of Knockshanvo, Oatfield and other wind energy developments within the East Clare uplands are acceptable, particularly where Knockshanvo and Oatfield would occupy the same upland landform and visual unit and materially increase the density and extent of turbines across prominent ridgelines.

CLG Assessment

The Further Information confirms that cumulative landscape and visual effects have been assessed. The principal issue is therefore not the **absence** of a cumulative assessment, but whether the conclusions drawn from that assessment are justified by the evidence presented.

In this regard, the Applicant's own evidence contains a number of important acknowledgements.

First, the proposed Oatfield Wind Farm is not a distant development with incidental intervisibility. The Applicant confirms that it is located approximately **500 m from the nearest Knockshanvo turbine**, within the same area of upland landscape. The LVIA expressly states that Oatfield and Knockshanvo would be seen within the **same visual**



unit and that Oatfield would contribute to cumulative effects on the physical fabric of that landform.

Second, the Applicant acknowledges that cumulative effects on landscape character would arise where Knockshanvo is visible with Oatfield and that this would generally occur from **most receptors in the landscape surrounding the site**. It further acknowledges that Oatfield would increase turbine density upon the elevated ridgelines surrounding the Central and Western Knockshanvo clusters.

Third, the LVIA acknowledges that the **greatest potential for significant cumulative visual effects** arises where Knockshanvo is visible in combination with Oatfield. It states that the Oatfield turbines would increase both the density of turbines visible within the uplands and the magnitude of visual change.

These are material findings. They demonstrate that the two developments would not read as discrete wind farms occupying visually separated landscape compartments in all relevant views. In several locations they would instead combine to create a substantially greater concentration of turbines across the same upland ridgelines.

The cumulative viewpoint analysis itself illustrates this effect. At VP3, the Knockshanvo and Oatfield turbines are described as being seen at similar scale and collectively upon the same elevated landform. At VP8, the Western Cluster of Knockshanvo is described as being absorbed amongst the Oatfield turbines so that the developments appear as one collective turbine cluster. At VP15, the Applicant acknowledges a greater density and wider extent of turbines across the upland area.

The CLG considers that these findings sit uneasily with the Applicant's broader proposition that setback distances and narrow valleys create sufficiently separate visual units to accommodate multiple wind farms without significant cumulative effect.

The Applicant's conclusion depends substantially upon its assessment that the Slieve Bernagh Uplands have a high capacity to absorb wind energy development. As addressed under Response R-015, however, that conclusion is materially influenced by the area's designation within the Clare Wind Energy Strategy. The Applicant's own landscape evidence acknowledges the remote and isolated character of the uplands and their panoramic landscape qualities.

The Clare Wind Energy Strategy does not state that cumulative development within the Slieve Bernagh Uplands is automatically acceptable. The Applicant's EIAR records the relevant cumulative guidance as:



“Acceptable, depending on topography as well as siting and design of wind energy developments involved.”

The qualification is important. Strategic designation does not confer unlimited landscape capacity. The acceptability of cumulative development remains dependent upon the actual relationship between the projects, their scale, siting and design.

In the present case, that relationship is unusually close. Knockshanvo and Oatfield would comprise **20 turbines in total**, with turbines located within approximately 500 m of one another across the same upland area. The combined developments would therefore represent a substantial concentration of very large wind turbines within the Slieve Bernagh uplands rather than two visually unrelated projects.

The Applicant also places weight upon the fact that Oatfield remains an uncertain future scenario because its planning outcome has not been determined. This procedural uncertainty does not diminish the need for a rigorous cumulative assessment. Oatfield is a live planning proposal and is sufficiently advanced and geographically proximate that its potential interaction with Knockshanvo plainly constitutes a material cumulative scenario. Indeed, the Applicant's decision to assess it at 14 of 15 viewpoints confirms its relevance.

The Commission should therefore assess the combined scenario on its environmental merits rather than discounting the significance of the effect because one of the developments remains within the planning process.

The CLG further considers that the Applicant's focus upon the incremental **contribution of Knockshanvo** at individual viewpoints risks understating the cumulative planning effect experienced by the receptor. The LVIA methodology states that the focus is upon the extent to which the proposed development contributes towards cumulative effects. That is an appropriate component of cumulative assessment, but the planning decision must also consider the character of the resulting environment if both developments proceed.

For a resident, road user or recreational receptor, the relevant experience is not simply whether Knockshanvo contributes more or less than Oatfield to a particular view. The relevant issue is the combined transformation of the landscape resulting from the presence of both developments.

This distinction is particularly important where the Applicant describes Knockshanvo turbines as being “absorbed” amongst Oatfield turbines or where Knockshanvo is said to make only a “minor” contribution to a cumulative effect. Such terminology may



accurately describe the incremental contribution of Knockshanvo, but it does not necessarily establish that the **combined cumulative effect itself is acceptable**.

The Applicant's Further Information therefore demonstrates that a substantial cumulative assessment has been undertaken, but it does not remove the fundamental planning concern. On the contrary, the assessment confirms that Knockshanvo and Oatfield would occupy the same visual unit, would frequently be visible together, would increase turbine density across the same elevated ridgelines and would, from certain viewpoints, appear as a collective turbine development.

CLG Conclusion

The Further Information does not satisfactorily resolve the concerns regarding cumulative landscape and visual effects.

The Applicant has undertaken an extensive cumulative LVIA and has assessed Oatfield at 14 of the 15 relevant viewpoints. The concern is therefore not a failure to identify Oatfield or other wind farms within the cumulative assessment.

Rather, the concern arises from the **results of the Applicant's own assessment**.

The Applicant acknowledges that Oatfield and Knockshanvo occupy the same upland landscape and visual unit; that Oatfield is approximately 500 m from the nearest Knockshanvo turbine; that cumulative effects would occur from most receptors surrounding the site; that Oatfield would increase the density of turbines on the elevated ridgelines; and that the greatest potential for significant cumulative visual effects arises from the combination of these two developments.

In those circumstances, the conclusion that the Slieve Bernagh uplands can simply “absorb” both developments requires substantially greater justification than is provided by reference to the area's wind energy policy designation and undulating topography.

The Commission should assess the **resulting combined landscape**, rather than merely the incremental contribution made by Knockshanvo at individual viewpoints.

Accordingly, the CLG submits that the Further Information does not demonstrate that the combined landscape and visual effects of Knockshanvo, Oatfield and the wider concentration of wind energy development are acceptable. The cumulative transformation of the Slieve Bernagh uplands remains a significant and material consideration in the determination of the application.



Response 17 – Human Health

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.17 – *Human Health*, and specifically Section 3.1.17.1 – *General Health Impacts*, pp. 59–60.

The Applicant identifies the human-health concerns raised in observations as including potential effects on general wellbeing, sleep disturbance and stress, with particular reference to persons with existing conditions such as autism, epilepsy, anxiety and migraine, together with concerns regarding infrasound.

In response, the Applicant refers back to Section 5.5.1 of Chapter 5, *Population and Human Health*, of the EIAR. It states that, although there are anecdotal reports of negative health effects among persons living very close to wind turbines, peer-reviewed research has generally not supported such claims.

The Applicant states:

“There is currently no published scientific evidence to positively link wind turbines with adverse health effects.”

It further states that extensive research has been undertaken in the United States, Canada, the United Kingdom and Australia, and by the World Health Organisation in 2018, and asserts that these studies conclude that exposure to wind farms and wind turbine sound does not trigger adverse health effects.

The Applicant therefore maintains the conclusion of the EIAR that significant adverse effects on human health will not arise from the proposed development.

Issue

Whether the Applicant's general reliance upon the absence of a demonstrated direct causal relationship between wind turbines and adverse health effects adequately addresses the potential effects of the proposed development on population and human health, particularly through noise, sleep disturbance, annoyance, shadow flicker and the interaction of environmental effects at sensitive receptors.



CLG Assessment

The Applicant's Further Information response is notably brief given the breadth of the human-health concerns identified.

The Applicant essentially advances one proposition: that because published research has not established a direct causal relationship between wind turbines and adverse health effects, significant effects on human health are not anticipated.

That approach is too narrow for the purposes of Environmental Impact Assessment.

The relevant question is not simply whether wind turbines have been scientifically established as a direct cause of a particular disease or medical condition. Population and human health assessment must also consider environmental pathways capable of affecting health and wellbeing, including **noise, sleep disturbance, annoyance, shadow flicker, water quality and the interaction between those effects.**

Indeed, the Applicant's own EIAR recognises these interactions. Chapter 17 states that operational noise has the potential to affect population and human health, while potential water pollution could have a significant negative effect on the health of users of water within the same catchment if mitigation were not implemented. It also recognises interactions between population and human health and landscape and visual effects.

The Applicant's statement that the WHO's 2018 work supports a general conclusion that wind turbine sound does not trigger adverse health effects also requires qualification.

As addressed under Response R-013, the **WHO Environmental Noise Guidelines for the European Region (2018)** are themselves relied upon by the National Environmental Health Service as relevant health-based guidance for the assessment of environmental noise. The NEHS considered the potential public-health effects of the proposed development by reference to the EPA's 2022 EIAR Guidelines and expressly identified the WHO Environmental Noise Guidelines as relevant to the assessment.

It is therefore insufficient to cite WHO 2018 simply as evidence supporting the proposition that wind turbines do not cause adverse health effects while not fully engaging with the WHO's recommendations concerning exposure to wind turbine noise.

This is particularly relevant because the human-health assessment cannot be separated from the unresolved noise issues considered under Response R-013. If uncertainty remains regarding the appropriateness of the operational noise criteria, background-



noise methodology, low-frequency noise and cumulative noise exposure, the Applicant cannot rely upon the noise assessment as a settled basis for excluding consequential effects on health and wellbeing.

The same applies to shadow flicker.

Immediately preceding the human-health response, the Applicant acknowledges that the **Sunyata Buddhist Centre (Dwelling No. 310)** is predicted to experience daily shadow flicker exceeding the 30-minute threshold in the absence of mitigation. The Applicant proposes mitigation and, if necessary, turbine control measures.

Accordingly, the Applicant's own evidence demonstrates that potentially intrusive environmental effects will arise at sensitive receptors unless operational mitigation is successfully implemented.

The assessment of human health must therefore consider not merely whether individual environmental effects comply with particular technical thresholds after mitigation, but whether the **combined exposure experienced by residents and other sensitive receptors** has been adequately evaluated.

This is particularly important for persons who may be more susceptible to environmental disturbance. The Applicant itself records that observations specifically identified persons affected by autism, epilepsy, anxiety and migraine. However, Section 3.1.17.1 does not provide a receptor-specific assessment of those concerns. Instead, they are answered through the same general statement concerning the absence of established causal evidence.

The CLG does not submit that the existence of such conditions automatically establishes that the proposed development will cause adverse health effects. The concern is that the Applicant expressly identifies the issue but does not substantively assess whether particularly sensitive persons may experience greater effects from noise, sleep disturbance, shadow flicker or other environmental changes.

There is also an important distinction between **clinical causation** and **planning effects on health and wellbeing**. A development does not need to be demonstrated to cause a diagnosed disease before effects on human health become relevant to the planning assessment. Persistent environmental noise, sleep disturbance and substantial changes to residential amenity may themselves be relevant population and human-health considerations.



For that reason, the Commission should not treat the Applicant's assertion that there is no published scientific evidence “to positively link wind turbines with adverse health effects” as determinative of the human-health assessment.

Rather, the human-health conclusions must stand or fall with the robustness of the underlying assessments of noise, shadow flicker, hydrology and water quality, residential amenity and their interactions.

CLG Conclusion

The Further Information does not satisfactorily resolve the concerns regarding population and human health.

The Applicant's response reduces a broad range of concerns regarding wellbeing, sleep disturbance, stress, infrasound and vulnerable receptors to the question of whether scientific literature establishes a direct causal relationship between wind turbines and adverse medical outcomes.

That is not the full assessment required.

The Applicant's own EIAR recognises that noise, water pollution and other environmental effects have pathways through which population and human health may be affected. Furthermore, the National Environmental Health Service has identified the WHO Environmental Noise Guidelines 2018 and the EPA EIAR Guidelines 2022 as relevant to consideration of public-health effects.

Where material issues remain unresolved regarding operational noise, low-frequency noise, shadow flicker, sensitive receptors and other environmental pathways, the Applicant cannot rely upon a general assertion that wind turbines have not been proven to cause adverse health effects as sufficient evidence that significant human-health effects will not arise.

Accordingly, the CLG submits that the Further Information does not provide a sufficiently comprehensive assessment of the potential effects on population, health and wellbeing, and this remains a material consideration for the Commission in determining the application.



Response 18 – Shadow Flicker

Applicant's Response

Further Information Response to Observations (FI-1), Section 3.1.18 – *Shadow Flicker*, and Section 3.1.18.1 – *Response*, pp. 60–65.

The Applicant responds to observations concerning the methodology and accuracy of the shadow flicker assessment, alleged omission of receptors, use of standardised 1 m × 1 m notional windows, use of ReSoft WindFarm modelling software, cumulative effects with Oatfield and other wind farms, effects on residential amenity and human health, and the reliability of the proposed SCADA-based mitigation.

The Applicant maintains that the assessment undertaken in Chapter 5 of the EIAR is comprehensive and complies with the current **Wind Energy Development Guidelines 2006**. It states that all 78 properties within the defined shadow flicker study area were modelled, including properties outside the geographical sector in which shadow flicker could theoretically occur. For each property, four notional 1 m × 1 m windows facing north, east, south and west were modelled, with no allowance made for screening from buildings, trees or other vegetation.

The Applicant states that ReSoft WindFarm Version 5.0.22 is an established industry modelling tool and that its maximum theoretical assessment assumes **100% sunshine during daylight hours**, which it characterises as a conservative precautionary assumption.

Where shadow flicker exceeds the relevant criteria, the Applicant proposes a hierarchy of mitigation including window blinds, screening vegetation, other site-specific measures agreed with affected parties and, ultimately, turbine control through the wind farm's **Supervisory Control and Data Acquisition (SCADA) system**. The Applicant states that a site visit will be undertaken to verify the model and SCADA system, and that SCADA-based shadow flicker mitigation is technically proven at wind farms in Ireland and internationally.

The Applicant therefore maintains that the proposed development can be operated so that unacceptable shadow flicker effects do not arise.



Issue

Whether the Applicant has adequately demonstrated that the predicted shadow flicker effects, including cumulative effects, have been comprehensively identified and that the proposed mitigation measures provide sufficient certainty that unacceptable shadow flicker will not occur at residential and other sensitive receptors.

CLG Assessment

The Further Information provides useful clarification of the modelling methodology but also confirms that the acceptability of the development in respect of shadow flicker is materially dependent upon **post-consent operational mitigation**.

The CLG accepts that the Applicant has adopted a conservative assumption of 100% sunshine for the maximum theoretical modelling and has disregarded screening by existing vegetation and buildings. Those assumptions appropriately avoid understating theoretical exposure arising solely from weather conditions or existing screening.

However, that does not resolve all of the concerns raised regarding the assessment.

A specific issue identified in observations was that **Dwellings Nos. 419, 422, 492 and 526 were omitted from the cumulative assessment with the proposed Oatfield Wind Farm**, together with concerns that other existing and proposed wind farms had not been correctly incorporated into the cumulative assessment. The Applicant itself records these concerns in Section 3.1.18.

This is material because the relevant planning effect is not simply the shadow flicker generated by Knockshanvo in isolation. Where a receptor may be affected by turbines belonging to more than one wind farm, the Commission must be satisfied that the **total potential exposure at that receptor** has been correctly identified.

The Applicant's reliance upon standardised 1 m × 1 m notional windows also warrants consideration. The use of standardised windows is a recognised modelling technique and the CLG does not suggest that every window at every dwelling must necessarily be physically measured. However, the Applicant acknowledges that larger windows may result in somewhat longer incidences or durations of shadow flicker than predicted by the standardised model. Its response is that any additional occurrence can be addressed by extending mitigation.



That approach illustrates an important feature of the Applicant's assessment: where actual effects exceed modelled effects, the proposed solution is not further refinement of the baseline assessment but **additional mitigation after the effect is identified**.

The same issue arises with the proposed SCADA system.

The Applicant states that SCADA control is technically proven and proposes verification through a site visit following installation. This is capable, in principle, of providing an effective operational mechanism for shutting down individual turbines during periods when shadow flicker would otherwise occur.

The planning question, however, is whether the mitigation commitment is sufficiently clear and enforceable.

There is an important distinction between a commitment to remain within the numerical limits contained in the 2006 Guidelines and a commitment to achieve **zero shadow flicker at affected properties**. The observations recorded by the Applicant specifically question whether the commitment to zero shadow flicker is consistent with the mitigation hierarchy described in the EIAR.

Measures such as installing blinds at an affected dwelling or planting screening vegetation do not eliminate the generation of shadow flicker by the turbine. They seek instead to reduce the effect experienced by the receptor. Those measures are qualitatively different from automatic turbine shutdown.

The CLG considers that the burden of mitigating an environmental effect generated by the proposed development should not be transferred to residents through reliance upon blinds or modifications to their properties where turbine control technology is available.

This point is particularly relevant in light of the **Draft Revised Wind Energy Development Guidelines 2019**, which adopt a substantially stronger approach to shadow flicker and envisage the use of modern turbine control systems so that existing dwellings and other affected properties should not experience shadow flicker.

The practical effectiveness of SCADA mitigation is demonstrated elsewhere in the planning record. In the **Ballycar Inspector's Report**, the Inspector accepted that shadow flicker could be effectively controlled through Shadow Flicker Control Measures whereby relevant turbines would automatically stop when meteorological and solar conditions capable of causing shadow flicker occurred at a receptor. The Inspector specifically noted the commitment that mitigation would **eliminate shadow flicker at a receptor** and that performance would be monitored on an ongoing basis.



That provides a useful benchmark for the present proposal. If the Applicant maintains that modern SCADA technology is capable of eliminating shadow flicker, then there is no clear planning justification for accepting a mitigation hierarchy which first contemplates blinds, vegetation or other receptor-side interventions.

The appropriate mitigation standard should therefore be clear: if permission were contemplated, turbine operation should be controlled so that **no shadow flicker occurs at existing dwellings or other identified sensitive properties**, rather than merely seeking compliance with the older annual and daily thresholds contained in the 2006 Guidelines.

There is also an interaction with the human-health and residential-amenity considerations addressed elsewhere in this submission. The Applicant characterises shadow flicker principally as an indoor phenomenon. While that describes the conventional technical definition used in wind farm assessments, the planning concern extends to the use and enjoyment of residential properties. Repeated interruption of sunlight within occupied rooms is itself an amenity effect and should be assessed accordingly.

The CLG therefore accepts that shadow flicker is technically capable of being controlled through turbine operation. However, the Further Information does not satisfactorily resolve the concern unless the mitigation commitment is unequivocally based upon elimination of shadow flicker at affected sensitive receptors and the cumulative modelling is demonstrated to include all relevant turbines and receptors.

CLG Conclusion

The Further Information provides additional clarification regarding the shadow flicker methodology and confirms that modern SCADA technology is available to control turbine operation during periods when shadow flicker would otherwise occur.

However, unresolved issues remain concerning the completeness of the **cumulative assessment**, including the specific concerns raised regarding Dwellings Nos. 419, 422, 492 and 526, and the precise mitigation standard that the Applicant proposes to achieve.

The CLG does not consider reliance upon window blinds, screening vegetation or other modifications at affected properties to represent an appropriate primary response to an effect generated by the development. Where SCADA technology is capable of preventing the effect at source, mitigation should occur through turbine control.



Accordingly, if the Commission were otherwise minded to grant permission, the CLG submits that it should not rely merely upon compliance with the shadow flicker thresholds contained in the 2006 Guidelines. Any permission would require an enforceable condition providing for **zero shadow flicker at existing dwellings and other identified sensitive receptors**, achieved through automatic turbine shutdown where necessary, together with verification and ongoing monitoring of the control system.

Subject to that fundamental requirement, shadow flicker is technically capable of mitigation. However, the Applicant's present Further Information does not, without such an enforceable requirement and confirmation of a complete cumulative assessment, fully resolve the concerns raised.

Response 19 – Instrument Flight Procedures

Applicant's Response

The Applicant's Further Information contains extensive additional material responding to observations from AirNav Ireland, Shannon Airport Authority, Clare County Council and other parties concerning the aviation effects of the proposed development.

The matters addressed include:

- Instrument Flight Procedures and the ATCSMAC;
- Performance Based Navigation;
- navigation-aid flight calibration;
- Woodcock Hill MSSR;
- Shannon Primary Surveillance Radar;
- radar shadowing, reflections and beam deflection;
- proposed radar mitigation;
- international case studies;
- consultation with AirNav Ireland; and
- proposed planning conditions.



The Applicant maintains that the identified aviation effects are capable of being addressed through technical mitigation, future procedure changes, continued engagement with the relevant aviation bodies and appropriate planning conditions.

CLG Assessment

Aviation represents a separate and potentially determinative constraint in relation to the proposed Knockshanvo Wind Farm.

Given the technical and safety-critical nature of these matters, the CLG has undertaken a consolidated specialist review of the Applicant's aviation Further Information.

Rather than duplicate that detailed analysis across a series of individual responses, the CLG's complete assessment is provided in **Section 4 – Specialist Aviation Response**.

That assessment addresses, in particular:

1. the long history of aviation safeguarding concerns associated with development at this location;
2. acknowledged impacts upon Instrument Flight Procedures and the ATCSMAC;
3. the Applicant's reliance upon future PBN implementation and procedure redesign;
4. unresolved questions concerning navigation-aid flight calibration;
5. the effects upon the Woodcock Hill MSSR, including line of sight, shadowing, reflections and Off-Boresight Error;
6. AirNav's real-world evidence of radar deflection;
7. the Applicant's TNO modelling and cumulative effects with Oatfield;
8. effects upon Shannon Primary Surveillance Radar;
9. the technical and practical deliverability of the proposed radar mitigation options;
10. the relevance and limitations of the international case studies relied upon by the Applicant;
11. the evidential status of consultation records and the formal positions expressed by AirNav;
12. the proposed aviation planning conditions; and
13. the cumulative aviation consequences of Knockshanvo and Oatfield.



CLG Conclusion

The Applicant has provided substantial additional aviation information. However, the submission of further technical material does not itself demonstrate that the aviation constraints have been resolved.

The Applicant acknowledges that aviation impacts arise and identifies a range of possible technical and procedural responses. However, material matters remain dependent upon future procedure redesign, PBN implementation, radar modification or supplementary infrastructure, regulatory approval and agreement with independent aviation bodies.

Of particular importance, AirNav has stated that the Woodcock Hill radar-deflection issue cannot, in its opinion, be mitigated and that turbine shadowing would introduce coverage gaps in controlled airspace. The Applicant has not demonstrated that AirNav has withdrawn those positions.

The CLG therefore submits that the relevant question is not whether potential aviation mitigation technologies exist, but whether the proposed development has been demonstrated to have a **safe, operationally acceptable, regulatorily approvable and practically deliverable aviation solution**.

For the reasons set out in detail in Section 4 – **Specialist Aviation Response**, the CLG submits that this has not been demonstrated.

The unresolved aviation effects therefore remain a substantial and independent basis upon which permission should be refused.

Response 20 – Woodcock Hill Radar

Applicant's Response

The Applicant provides additional technical material concerning the potential effects of the proposed development on the **Woodcock Hill Monopulse Secondary Surveillance Radar ("MSSR")**.



The Further Information includes additional modelling and assessment concerning matters including:

- line of sight between the proposed turbines and Woodcock Hill;
- radar beam deflection and Off-Boresight Error (“OBE”);
- radar shadowing and reflections;
- cumulative effects associated with the adjoining Oatfield development;
- overlapping surveillance coverage; and
- possible technical mitigation measures.

The Applicant relies upon this additional assessment and the availability of potential mitigation measures to support its position that effects upon the Woodcock Hill MSSR are capable of resolution.

CLG Assessment

The additional technical information does not demonstrate that the Woodcock Hill issue has been resolved.

Rather, the Applicant's own technical assessment confirms that the proposed turbines interact with the radar. TNO identifies full line of sight and predicts additional OBE/beam-deflection effects associated with Knockshanvo, with the affected radar sector increasing further when the adjoining Oatfield turbines are included.

AirNav Ireland has separately identified concerns regarding radar deflection, reflections, shadowing, coverage gaps and degradation in probability of detection.

Of particular significance, AirNav has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”

AirNav has also stated that turbine shadowing would:

“introduce coverage gaps in controlled airspace”

and that its IAA-approved change-management system does not permit changes to the functional surveillance system which would result in a less safe system than the existing configuration.

The Applicant identifies a range of possible responses, including modification of existing radar infrastructure, supplementary radar, overlapping surveillance and alternative



surveillance technologies. However, no final solution has been demonstrated which is presently accepted by AirNav and shown to preserve the required surveillance performance.

The cumulative relationship with **Oatfield** is particularly important. Knockshanvo and Oatfield would together introduce approximately 20 turbines within the same wider Woodcock Hill surveillance environment, and the Applicant's own TNO modelling identifies an expansion of the affected radar sector when Oatfield is added.

The CLG therefore considers that the relevant issue is not whether radar effects have now been modelled in greater detail. The relevant issue is whether those acknowledged effects have been demonstrated to be **operationally acceptable and capable of effective, approved and deliverable mitigation**.

That has not been demonstrated.

Specialist Aviation Response

The CLG's detailed technical assessment of the Woodcock Hill MSSR is provided in Section 4 – **Specialist Aviation Response**, particularly:

- **Woodcock Hill MSSR;**
- **Proposed Radar Mitigation;**
- **International Case Studies;** and
- **Proposed Planning Conditions and Deliverability.**

Those sections address in detail:

- radar line of sight;
- shadowing;
- reflections;
- beam deflection and OBE;
- AirNav's measured real-world evidence;
- TNO's modelling;
- Tooman overlapping coverage;
- cumulative Knockshanvo/Oatfield effects; and
- the feasibility and deliverability of the proposed mitigation.

Those sections should be read as an integral part of this response.



CLG Conclusion

The Further Information provides additional technical assessment of the Woodcock Hill MSSR but does not resolve the fundamental aviation constraint.

The Applicant's own evidence confirms radar interaction and predicts additional OBE effects, while AirNav continues to identify material concerns regarding deflection, shadowing and surveillance coverage.

Most importantly, AirNav has stated that the radar-deflection issue cannot, in its opinion, be mitigated.

Accordingly, the CLG submits that the Woodcock Hill radar issue remains unresolved. The Commission should not grant permission on the basis that one of several possible future technical solutions may subsequently prove capable of addressing an effect which the operator of the affected safety-critical surveillance system presently considers incapable of mitigation.

The detailed basis for this conclusion is set out in Section 4 – **Specialist Aviation Response**.

Response 21 – AirNav Mitigation Proposals

Applicant's Response

The Applicant responds to AirNav Ireland's concerns by identifying a range of potential measures which it considers could mitigate the aviation effects of the proposed development.

These include modification or optimisation of existing radar infrastructure, supplementary radar, overlapping surveillance from other systems including Tooman, alternative surveillance technologies and continued technical engagement with AirNav.



The Applicant therefore maintains that the identified aviation effects are capable of mitigation and do not require refusal of permission.

CLG Assessment

The Further Information identifies a number of **potential mitigation options**, but it does not demonstrate that an accepted and deliverable mitigation solution has been established.

This distinction is important.

AirNav, as operator of the affected surveillance infrastructure, has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”

AirNav has also identified turbine shadowing, coverage gaps within controlled airspace and degradation in probability of detection.

The Applicant has not demonstrated that AirNav has withdrawn or materially revised these positions.

The various alternatives identified by the Applicant — including modification of existing radar, supplementary MSSR, reliance upon overlapping coverage and alternative surveillance technologies — remain potential technical pathways rather than an agreed solution. No single option has been demonstrated to address all identified effects, accommodate the cumulative Knockshanvo/Oatfield configuration, preserve the required surveillance performance and obtain AirNav and regulatory acceptance.

The Applicant’s commitment to fund or facilitate mitigation does not resolve this uncertainty. Implementation would depend upon AirNav, regulatory approval and, depending upon the solution selected, potentially new infrastructure, land and other third-party arrangements.

Continued engagement with AirNav is necessary, but **continued engagement is a process rather than a mitigation measure**. There is an important distinction between agreeing the detailed implementation of an established solution after permission and attempting after permission to determine whether an acceptable solution exists at all.



Specialist Aviation Response

The proposed mitigation options, including supplementary radar, Tooman coverage, alternative surveillance technologies and their practical and regulatory deliverability, are examined in detail in Section 4 – **Specialist Aviation Response**, particularly **Sections E, F, G and J**.

That specialist analysis should be read as an integral part of this response.

CLG Conclusion

The Applicant has demonstrated that a number of potential technical options could be investigated. It has **not demonstrated an agreed, operationally acceptable and deliverable mitigation solution** for the aviation effects of the proposed development.

This is particularly significant given AirNav's continuing position that the radar-deflection issue cannot, in its opinion, be mitigated.

Accordingly, the CLG submits that the Commission should not treat a range of possible future technical options as equivalent to an established mitigation solution. The necessary aviation mitigation remains unresolved.

Response 22 – Bird Collision Risk

Applicant's Response

Further Information Response to Observations (FI-1), Section 4.2.2.1 – *Bird Collision Risk*, pp. 74–75.

The Applicant responds to the observations of the Department of Housing, Local Government and Heritage concerning collision risk to birds by relying upon the ornithological surveys, flight activity data and Collision Risk Modelling (CRM) undertaken for the proposed development.

The Applicant maintains that the survey programme provides a sufficiently robust baseline from which collision risk can be assessed and that the CRM has been



undertaken in accordance with accepted guidance. It states that the predicted collision rates for the relevant target species are low and would not result in significant population-level effects.

The Applicant further relies upon the design of the proposed development, the reduction in turbine numbers through the iterative design process, the spatial distribution of recorded bird activity and the proposed biodiversity and habitat management measures.

The Applicant therefore maintains the conclusion of the EIAR that collision mortality associated with the proposed turbines will not result in a significant adverse effect on the conservation status of the bird species assessed, either individually or cumulatively.

Issue

Whether the Further Information demonstrates, on the basis of sufficiently robust and representative survey data and collision risk modelling, that turbine collision mortality will not give rise to significant effects on sensitive bird species, particularly when considered together with displacement, habitat loss and the cumulative concentration of wind energy development within the East Clare uplands.

CLG Assessment

The Applicant has undertaken a substantial ornithological survey programme and the CLG does not suggest that collision risk has simply been omitted from the environmental assessment.

The material issue is whether the modelling provides sufficient certainty to support the Applicant's conclusion of no significant effect.

Collision Risk Modelling is necessarily predictive. Its output is dependent upon the quality and representativeness of the underlying flight activity data and upon a series of modelling assumptions, including flight height, turbine dimensions, bird behaviour, avoidance rates and the extent to which recorded activity represents future use of the site.

Accordingly, a numerical prediction of a low annual collision rate should not be treated as an observed environmental outcome. It is the product of the assumptions and datasets incorporated into the model.



This is particularly important for species of conservation concern. Where population size is limited, breeding productivity is low or the species is already subject to other pressures, even relatively small additional mortality may have greater ecological significance than the absolute collision number might initially suggest.

The assessment must therefore consider the ecological significance of additional mortality rather than relying solely upon whether the predicted numerical collision rate appears low.

The Commission should also consider collision mortality together with the other effects of the proposed development on the same bird populations.

The Applicant's ornithological assessment separates collision risk, habitat loss and displacement for assessment purposes. This is understandable methodologically, but birds potentially affected by turbine collision are also exposed to habitat alteration, construction disturbance, operational displacement and cumulative loss of suitable habitat.

The relevant ecological effect is therefore the combined pressure imposed upon the population.

This is particularly significant in relation to **Hen Harrier**, which is separately addressed under Responses R-009 and R-010. The planning record establishes that the East Clare uplands are used by Hen Harrier and that the proposed development forms part of a wider concentration of existing, permitted and proposed wind farms affecting the same landscape.

Even where predicted direct collision mortality is low, this does not establish that the overall effect on the species is insignificant when displacement, habitat loss and cumulative development are taken into account.

The same principle applies to other target species recorded during the Applicant's surveys.

The Applicant also relies upon avoidance rates within the CRM. Avoidance rates are an established component of collision modelling, but they necessarily represent assumptions concerning how birds respond to turbines. A small alteration in the assumed avoidance rate can materially alter the predicted collision figure, particularly where the number of recorded flights is limited.

For that reason, the Commission should attach greater weight to the overall ecological evidence than to any single modelled collision figure.



The cumulative assessment is especially important.

Knockshanvo is not proposed within an undeveloped landscape in which the nine turbines would represent the only collision hazard. Existing and proposed wind energy developments occur throughout the wider East Clare uplands, including the immediately adjoining Oatfield proposal.

For wide-ranging bird species, administrative project boundaries have little ecological relevance. A bird moving through the wider upland landscape may encounter turbines belonging to several different developments.

The appropriate cumulative question is therefore not simply the predicted collision mortality attributable to the nine Knockshanvo turbines but the additional mortality risk arising across the wider network of wind energy development used by the same bird populations.

The Applicant maintains that cumulative collision effects have been assessed and are not significant. However, the Further Information does not provide materially new population-level analysis demonstrating that the combined collision risk from Knockshanvo, Oatfield and other relevant wind farms can be regarded as insignificant when combined with displacement and habitat effects.

This is consistent with the broader difficulty identified under Response R-007 concerning cumulative biodiversity assessment. Individual effects are repeatedly assessed as being below the threshold of significance, but the ecological consequences of the progressive concentration of wind energy infrastructure across the same upland ecosystem require consideration as a whole.

The Department's intervention is also material. The fact that the prescribed body responsible for nature conservation considered collision risk sufficiently important to require further response means that the issue should not be disposed of solely by restating the conclusions of the original EIAR.

The Applicant's Further Information provides clarification and defends its methodology, but it does not materially alter the underlying survey dataset or provide post-construction evidence capable of validating the predicted collision rates.

There is therefore an inherent degree of uncertainty in the prediction.

That uncertainty does not necessarily mean that significant collision mortality will occur. It does mean, however, that the Applicant's conclusion of no significant effect must be



considered in the context of the conservation status of the affected species, the other ecological effects of the development and the cumulative wind energy context.

CLG Conclusion

The Further Information does not fully resolve the concerns regarding bird collision risk.

The CLG acknowledges that the Applicant has undertaken extensive ornithological surveys and has applied recognised Collision Risk Modelling methodologies. However, CRM remains a predictive exercise dependent upon assumptions concerning bird activity, flight behaviour, avoidance rates and future use of the site.

The Applicant's conclusion that predicted collision mortality is low should therefore not be considered in isolation.

The Commission must consider collision risk together with **habitat loss, disturbance, displacement and cumulative wind energy development affecting the same bird populations**, particularly Hen Harrier and other species of conservation concern.

In the context of Knockshanvo and the immediately adjoining Oatfield proposal, together with other wind energy developments within the East Clare uplands, the relevant ecological issue is the cumulative pressure imposed upon bird populations across the wider landscape rather than the modelled mortality associated with each individual development considered separately.

Accordingly, while the Further Information provides additional justification for the Applicant's collision risk methodology, it does not provide materially new evidence sufficient to remove the residual uncertainty concerning cumulative population-level effects.

The CLG submits that bird collision risk must therefore remain part of the Commission's overall assessment of ornithological effects and should be considered together with the unresolved issues concerning **Hen Harrier, displacement, habitat compensation and cumulative biodiversity effects** before any conclusion of no significant adverse effect is reached.



Response 23 – Adequacy of Compensation and Enhancement Lands

Applicant's Response

Further Information Document FI-1, Section 4.2.2.3 – Adequacy of Compensation and Enhancement Lands, pp. 75–78.

This response addresses concerns raised by the **Department of Housing, Local Government and Heritage (DHLGH)** regarding the adequacy of the compensation and enhancement lands proposed for Hen Harrier.

The Applicant maintains that the proposed compensation and enhancement package is sufficient to address the predicted loss of Hen Harrier foraging habitat. The Applicant relies on the Biodiversity Management Plan and compares the predicted habitat loss with the habitat proposed for compensation and enhancement.

In particular, **Table 5** of the Further Information presents the Applicant's comparison of predicted habitat loss against proposed compensation and enhancement. The Applicant emphasises what it describes as a **near 1:1 ratio of deforestation to offset the predicted habitat loss**, stating that the approximately **4 ha shortfall should be considered in conjunction with a further 46.5 ha of farmland enhancement**.

The underlying EIAR identifies the potential for the loss of **58.57 ha of Hen Harrier foraging habitat through displacement** during operation. The Applicant proposes **54.2 ha of compensation lands**, involving permanent felling of forestry and restoration of the underlying peatland, together with a further **46.5 ha of upland grassland and peatland/farmland for enhancement and safeguarding for foraging Hen Harrier**. This gives a stated total of approximately **100.7 ha of compensation and enhancement lands**.

The Applicant states that permanent forestry removal will create habitat of greater long-term value because the restored peatland would remain available to Hen Harrier, whereas commercial forestry provides suitable habitat only periodically during the forestry rotation before canopy closure. The additional farmland enhancement is proposed to include retention and reinstatement of beneficial landscape features, rush management and management of grazing timing and intensity.



The Applicant therefore maintains that the proposed package is adequate to compensate for the predicted habitat effects and to ensure the continuing availability of suitable Hen Harrier habitat.

Issue

Whether the Applicant has demonstrated that the proposed compensation and enhancement lands provide an adequate, additional, ecologically equivalent and sufficiently certain response to the predicted loss of **58.57 ha of Hen Harrier foraging habitat through displacement**, particularly where the direct compensation component of 54.2 ha is itself less than the predicted habitat loss and the balance of the Applicant's case depends upon the anticipated ecological benefit of 46.5 ha of farmland enhancement.

CLG Assessment

The Further Information is significant because it confirms that the Applicant's own assessment predicts a **long-term significant negative effect on foraging Hen Harrier in the absence of compensation and enhancement**.

Chapter 7 of the EIAR expressly identifies the potential loss of **58.57 ha of foraging habitat through displacement** during the operational phase. The proposed compensation and enhancement measures are therefore not ancillary biodiversity improvements. They are integral to the Applicant's conclusion that the significant effect identified in the unmitigated scenario can be reduced to a non-significant residual effect.

The Commission must therefore be satisfied that the compensation relied upon is sufficiently certain and ecologically effective.

The proposed direct compensation is less than the predicted habitat loss

The Applicant proposes **54.2 ha of forestry for permanent felling and peatland restoration** against a predicted displacement loss of **58.57 ha of Hen Harrier foraging habitat**.

The Applicant itself therefore acknowledges a quantitative shortfall of approximately 4 ha in the direct compensation component and seeks to address this by reference to the



additional 46.5 ha of farmland enhancement. Indeed, the Further Information expressly states that the shortfall should be weighed against that additional enhancement.

The CLG considers that this comparison requires greater scrutiny than a simple hectare-for-hectare calculation.

The predicted 58.57 ha loss represents habitat which the Applicant has assessed as functionally available to Hen Harrier, but which may become unavailable through operational displacement. The proposed 54.2 ha compensation, by contrast, consists principally of forestry proposed for permanent felling and subsequent restoration.

The ecological benefit of the compensation therefore depends upon successful conversion of the existing forestry into habitat that subsequently functions as suitable Hen Harrier foraging, nesting or roosting habitat.

The hectares are consequently not automatically interchangeable.

Habitat area is not the same as habitat function

The Applicant's assertion of a near 1:1 compensation ratio places considerable emphasis upon area.

However, ecological compensation cannot be demonstrated by area alone.

The functional value of Hen Harrier habitat depends upon factors including vegetation structure, prey abundance, proximity to breeding territories, landscape connectivity, disturbance, land management and the relationship between foraging and nesting habitat.

The Applicant's EIAR states that permanent forestry removal would provide an advantage because restored peatland would remain permanently available, whereas forestry may only provide suitable Hen Harrier habitat periodically before canopy closure.

That may provide a genuine ecological benefit if successfully delivered. However, it also confirms that the compensation depends upon a **future habitat transition**. The Commission must therefore be satisfied that the proposed forestry removal and restoration will actually produce habitat of the quality and functionality assumed in the assessment.

The mere removal of commercial forestry does not itself establish successful peatland restoration or equivalent Hen Harrier habitat.



The 46.5 ha farmland enhancement cannot simply be added to the compensation total

The Applicant places substantial weight upon the additional **46.5 ha of farmland enhancement**, bringing the overall stated compensation and enhancement package to 100.7 ha.

However, there is an important distinction between **compensation** and **enhancement**.

The Applicant proposes management measures including rush management, retention and reinstatement of scrub and hedgerows, and changes to grazing timing and intensity. These measures may improve the ecological quality of the lands concerned.

Nevertheless, if those lands already provide some Hen Harrier foraging function, the entire 46.5 ha cannot automatically be treated as 46.5 ha of newly created habitat.

The relevant compensatory benefit is the **additional ecological function produced by the management measures over and above the existing baseline condition**.

This is a material distinction.

The Applicant's numerical presentation risks creating the impression that 58.57 ha of affected habitat is being compensated by 100.7 ha of new habitat. That is not demonstrated merely by adding the gross area of enhancement lands to the area proposed for forestry removal.

The Commission should instead consider the actual additional ecological gain attributable to the proposed management of those 46.5 ha.

Timing and certainty of habitat restoration

The Applicant states elsewhere in the EIAR that the compensation and enhancement measures will be put in place **before construction begins**, so that sufficient foraging habitat will be available before disturbance or displacement occurs.

That commitment is important, but implementation of management measures before construction does not necessarily mean that the intended ecological function will have been achieved before the effect arises.



Forestry removal can occur relatively quickly. Restoration of underlying peatland habitat and development of the ecological characteristics upon which Hen Harrier foraging value depends may take considerably longer.

The relevant question is therefore not merely when the restoration works commence, but **when the restored habitat becomes functionally capable of providing the ecological benefit assumed by the Applicant.**

The Further Information does not establish that the full ecological functionality attributed to the compensation lands will exist before the predicted displacement effect occurs.

This creates the possibility of a temporal deficit between loss of existing habitat function and establishment of the compensatory habitat.

The Applicant's conclusion depends upon successful implementation

The wording of the Applicant's own assessment is important.

In its response concerning the national importance of the area for Hen Harrier, the Applicant states that **“following the successful implementation of compensation and enhancement measures, no significant residual impacts are predicted.”**

The conclusion of no significant residual effect is therefore expressly conditional upon the **successful** implementation of the compensation strategy.

Successful implementation must mean more than carrying out the prescribed management actions. It must include successful ecological outcomes.

The Commission should therefore distinguish between certainty that forestry can be felled or grazing regimes altered and certainty that those actions will result in the predicted level of Hen Harrier habitat utilisation.

The latter is the relevant issue where the ecological significance conclusion depends upon compensation.

Cumulative context

The adequacy of these lands must also be considered in the wider cumulative context.



Hen Harrier utilises the landscape irrespective of individual planning boundaries. Knockshanvo is proposed within an area subject to extensive existing and proposed wind energy development, including the immediately adjoining Oatfield proposal.

Where more than one project affects Hen Harrier habitat within the same upland landscape, compensation cannot properly be assessed solely at individual project level without considering the cumulative availability of suitable habitat.

This is particularly important where individual projects rely upon the proposition that alternative suitable habitat remains available elsewhere within the landscape.

The Commission must therefore be satisfied that the proposed Knockshanvo compensation and enhancement lands provide genuine additional habitat function and are not merely part of the same finite upland habitat resource being relied upon as alternative or compensatory habitat across separate wind farm assessments.

CLG Conclusion

The Further Information does not provide sufficient certainty that the proposed compensation and enhancement lands adequately compensate for the predicted Hen Harrier habitat effects.

The Applicant's own EIAR identifies the potential for a **long-term significant negative effect involving the loss through displacement of 58.57 ha of Hen Harrier foraging habitat**. Against this, the direct compensation component comprises **54.2 ha of forestry proposed for permanent felling and peatland restoration**, leaving a quantitative shortfall which the Applicant seeks to address principally through a further **46.5 ha of farmland enhancement**.

The Commission should not determine the adequacy of this package simply by adding the gross areas of compensation and enhancement lands.

The relevant question is whether the proposed measures will provide **additional, functionally equivalent and timely ecological benefit** sufficient to replace the habitat function affected by displacement.

In particular, the Applicant has not demonstrated that the entire 46.5 ha of enhancement lands represents newly created Hen Harrier habitat rather than improvement of habitat which already possesses some ecological value, nor has it established that restored forestry lands will achieve the assumed ecological functionality before displacement effects occur.



The Applicant's own conclusion of no significant residual effect is expressly dependent upon the **successful implementation** of these measures.

Accordingly, the CLG submits that the adequacy, additionality, timing and ecological effectiveness of the compensation and enhancement lands remain unresolved. Given that these measures are relied upon to reduce an otherwise **long-term significant negative effect** on Hen Harrier to a non-significant residual effect, this uncertainty is a **material consideration for the Commission and should not be treated as a matter capable of resolution solely through post-consent monitoring or adaptive management.**

Response 24 – HSE / Public Health

Applicant's Response

Further Information Document FI-1, Section 4.4 – HSE, pp. 84–85, with the detailed noise response provided by AWN Consulting in Appendix 3 of FI-2.

The Applicant responds to the submission of the **Health Service Executive (HSE)** concerning the potential effects of the proposed development on public health. The Applicant acknowledges that the HSE submission emphasises the importance of population-health effects, the identification of sensitive receptors and the need to have regard to emerging guidance and recent publications alongside existing statutory guidance.

The Applicant identifies the HSE's principal concern as the potential effect of operational wind turbine noise on public health. In particular, the HSE places weight upon more recent evidence and guidance, including the **World Health Organisation Environmental Noise Guidelines for the European Region (2018)** and the Draft Wind Energy Development Guidelines.

The Applicant refers the HSE's noise observations to the detailed response prepared by AWN Consulting and states, in summary, that:

“The WHO 2018 guidelines are not considered applicable for the assessment of environmental wind turbine noise.”



The Applicant instead maintains that its assessment has been undertaken in accordance with the applicable **Wind Energy Development Guidelines 2006 (WEGs)** together with best-practice guidance for wind turbine noise assessment, and is therefore consistent with current practice.

The Applicant also notes that the HSE withdrew its **2017 Position Paper on Wind Turbines and Public Health in November 2025** and relies upon this as part of its response to the HSE's observations.

The Applicant therefore maintains that the EIAR has adequately assessed public-health effects and that its noise assessment methodology remains appropriate notwithstanding the HSE's reliance upon more recent health-based noise guidance.

Issue

Whether the Applicant has adequately addressed the HSE's public-health concerns, particularly its reliance upon more recent health-based evidence and the WHO Environmental Noise Guidelines 2018, or whether the Applicant's continued reliance principally upon the 2006 Wind Energy Development Guidelines leaves unresolved uncertainty regarding the protection of public health from operational wind turbine noise.

CLG Assessment

The HSE response is of particular significance because the concerns regarding noise and public health are not confined to third-party observers. They arise from the State body with specific expertise and responsibilities in relation to public and environmental health.

The Applicant acknowledges that the HSE places weight upon more recent evidence and guidance but responds principally by stating that the WHO 2018 Guidelines are not considered applicable to the assessment of environmental wind turbine noise.

That position requires careful scrutiny.



The WHO 2018 Guidelines expressly address wind turbine noise

The Applicant's assertion that the WHO 2018 Guidelines are not applicable to environmental wind turbine noise is difficult to reconcile with the content of the Applicant's **own EIAR**.

Chapter 5, *Population and Human Health*, expressly describes the WHO Environmental Noise Guidelines as providing recommendations for protecting human health from environmental noise originating from various sources, specifically including **wind turbine noise**.

The Applicant's EIAR further records that, for average exposure, the WHO Guideline Development Group conditionally recommends reducing wind turbine noise below **45 dB Lden**. It also records that the WHO associates exposure above that level with adverse health effects and recommends that renewable-energy policies include provisions to ensure that wind farm noise does not exceed the recommended average exposure value.

There is therefore an apparent inconsistency between the treatment of WHO 2018 in the original EIAR and the position now advanced in the Further Information.

In the EIAR, WHO 2018 is expressly identified as relevant published evidence addressing wind turbine noise and human health.

In the Further Information, however, the Applicant states that WHO 2018 is “**not considered applicable**” to the assessment of environmental wind turbine noise.

The Applicant does not satisfactorily explain this apparent change in position.

Statutory guidance and health-based evidence perform different functions

The CLG accepts that the **2006 Wind Energy Development Guidelines remain the extant statutory planning guidance** applicable to wind energy development.

However, this does not mean that more recent scientific and public-health evidence should be disregarded.

The HSE's observation itself recognises this distinction by referring to the need to consider emerging guidance and recent publications **alongside existing statutory guidelines**.



The issue is therefore not whether WHO 2018 legally replaces the 2006 WEGs. It does not.

The relevant question is whether the Commission, in carrying out an Environmental Impact Assessment and considering potential effects on population and human health, should have regard to contemporary health-based evidence concerning environmental noise.

The CLG submits that it plainly should.

A planning assessment may comply with an existing statutory guidance document while still requiring consideration of subsequent scientific evidence relevant to the environmental effect being assessed.

This is particularly important where the applicable statutory wind-energy guidance is now approximately **20 years old** and the scale and characteristics of modern wind turbines have changed substantially since its publication.

Withdrawal of the HSE 2017 Position Paper does not resolve the issue

The Applicant specifically notes that the HSE withdrew its 2017 Position Paper on Wind Turbines and Public Health in November 2025.

That fact should not be given greater significance than it warrants.

The HSE's Further Information submission does not depend solely upon the 2017 Position Paper. On the contrary, the Applicant itself records that the HSE places weight upon **more recent evidence and guidance**, including WHO 2018.

Withdrawal of a 2017 HSE document therefore does not invalidate the subsequent WHO evidence or remove the HSE's present public-health concerns.

Indeed, the fact that the HSE itself has moved away from an older position paper reinforces rather than diminishes the importance of considering contemporary evidence.

The relevant issue for the Commission is the substance of the current HSE observation, not the status of a previous HSE document which has since been withdrawn.



The Applicant's own EIAR recognises the WHO health-based recommendation

The Applicant's EIAR provides an important evidential benchmark.

It records that the WHO Guideline Development Group recommends average wind turbine noise exposure below **45 dB Lden** and recognises the potential for increased annoyance at lower exposure levels, while acknowledging limitations in the available evidence concerning other health outcomes.

The CLG does not suggest that WHO 2018 establishes a simple alternative planning noise limit which can automatically be substituted for the WEG criteria. The WHO metric and the WEG/ETSU methodology are not directly interchangeable without appropriate acoustic analysis.

That is precisely why the Applicant's response is inadequate.

Rather than providing an analysis explaining how the predicted Knockshanvo exposure relates to the WHO health-based recommendation, the Applicant largely dismisses WHO 2018 as inapplicable.

The Commission is consequently left without a transparent comparison between the Applicant's predicted noise environment and the more recent health-based guidance specifically raised by the HSE.

Public health cannot be reduced to compliance with a planning noise limit

The Applicant's response also risks conflating compliance with applicable planning noise criteria with the absence of public-health effects.

These are related but not identical propositions.

As addressed under the earlier responses concerning noise and human health, population and human health assessment must consider environmental pathways through which health and wellbeing may be affected. These include noise exposure, annoyance and sleep disturbance as well as the interaction with other environmental effects.

The Applicant's Chapter 5 itself recognises WHO 2018 as a source concerned specifically with **protecting human health from environmental noise**.



Accordingly, demonstrating compliance with the numerical framework adopted under the 2006 WEGs does not automatically answer the separate EIA question of whether the predicted environmental noise exposure has been adequately considered from a contemporary public-health perspective.

The Ballycar evidence requires careful interpretation

The wider planning record contains a useful comparator in the Ballycar Wind Farm Inspector's Report.

In that case, the National Environmental Health Service considered the WHO Environmental Noise Guidelines 2018 to constitute a **health protection standard**. However, the NEHS concluded on the particular Ballycar evidence that predicted noise exposure was sufficiently low that assessment under WHO 2018 was not required.

That distinction is significant.

The NEHS did **not** dismiss WHO 2018 as inherently irrelevant to wind turbine noise. Rather, it recognised the Guidelines as a health-protection standard but concluded, based upon the predicted exposure levels in that particular application, that further assessment against them was unnecessary.

That is materially different from the position advanced by the Knockshanvo Applicant that WHO 2018 is simply “not considered applicable”.

The Ballycar evidence therefore demonstrates the more appropriate approach: the relevance of WHO 2018 should be considered by reference to the predicted exposure and public-health circumstances of the particular development rather than excluded at the outset.

CLG Conclusion

The Further Information does not satisfactorily resolve the HSE's concerns regarding operational wind turbine noise and public health.



Response 25 – TII / National Road and Turbine Delivery Route Matters

Applicant's Response

Further Information Document FI-1, Section 4.5 – *Transport Infrastructure Ireland*, pp. 85–87.

The Applicant responds to eight matters raised by **Transport Infrastructure Ireland (TII)** concerning the national road network, the turbine delivery route and the proposed Temporary Transition Compound (TTC) on the N69.

The Applicant states that:

- the Design Report required under **TII Publication DN-GEO-03030** for the proposed TTC has now been uploaded to the TII Departures Portal, dated 8 April 2026;
- although TII advised that its review of the Design Report could result in material changes or alterations to the proposal, the Applicant states that **no such changes have been requested to date** and that TII will be consulted further prior to construction;
- Clare County Council and Limerick City and County Council were consulted regarding haul routes and delivery arrangements;
- the turbine delivery route has been subject to swept-path assessment and traffic-capacity assessment;
- a detailed delivery programme will be agreed with TII, Clare County Council and Limerick City and County Council before construction;
- a **Stage 1 Road Safety Audit** has been completed for the entire turbine delivery route, including the proposed TTC on the N69, and the Applicant states that all recommendations will be adopted;
- proposals affecting the national road network will be referred to TII;
- the Applicant accepts that the identified traffic mitigation measures may be imposed by condition;
- pre- and post-construction road condition surveys will be undertaken and damage to the national road network will be reinstated; and
- although the turbine components constitute abnormal loads in terms of dimensions, the Applicant states that they will not involve abnormal axle weights. Notwithstanding this, a **structural survey of locations along the turbine delivery**



route will be undertaken prior to construction, with the locations to be agreed with the relevant roads authorities.

The Applicant therefore maintains that the national-road and abnormal-load issues identified by TII are capable of being satisfactorily addressed through the submitted assessments, further engagement with the road authorities and construction-stage traffic management measures.

Issue

Whether the Further Information provides sufficient certainty at the planning decision stage that the proposed turbine delivery route and Temporary Transition Compound can be safely and acceptably accommodated on the national road network, particularly where TII's review process remains incomplete and a full structural assessment of the relevant national-road structures is deferred until prior to construction.

CLG Assessment

The CLG acknowledges that a number of the matters raised by TII have been substantively addressed by the Applicant.

In particular, the Applicant has completed a Stage 1 Road Safety Audit, has undertaken swept-path analysis of the turbine delivery route, accepts responsibility for reinstatement of any road damage, and has committed to detailed liaison with the relevant road authorities concerning delivery scheduling and temporary traffic management.

Those matters do not, in themselves, constitute a substantive basis for objection.

However, two issues remain material.

TII review of the N69 Temporary Transition Compound remains incomplete

The EIAR itself records that TII raised a specific concern regarding the proposed Temporary Transition Compound on the **N69 within a 100 km/h speed-limit zone**, noting that the proposal does not comply with Section 2.5 of the *Spatial Planning and*



National Roads Guidelines for Planning Authorities and reflecting similar concerns contained in the Limerick Development Plan.

The TTC is required because the abnormal turbine components cannot negotiate the full delivery route in their conventional transport configuration and must therefore be transferred at this location.

The Applicant has prepared the required DN-GEO-03030 Design Report and states that it uploaded the report to the TII Departures Portal on 8 April 2026. That is a material improvement upon the position identified in TII's observation.

However, the Applicant also expressly records TII's advice that:

upon review of the report, material changes and alterations to the proposal may be required.

The Applicant's answer is simply that no material alterations have been requested “**to date**” and that TII will be consulted further prior to construction.

That does not establish that TII has completed its assessment or accepted the proposed TTC.

The distinction is important. The absence of a request for amendment at a particular point in time is not equivalent to confirmation that the design satisfies TII's requirements.

Where TII has expressly advised that its review may require material alterations, the Commission should be satisfied before granting permission that any such alterations would remain within the scope of the development subjected to EIA and public participation.

A fundamental redesign of access arrangements, road geometry or temporary works on the N69 could have consequences extending beyond routine construction detail.

Accordingly, the Applicant's statement that consultation will continue before construction does not entirely resolve the planning issue.

Full structural assessment of the delivery route remains deferred

TII identifies as **critical** the requirement for a full assessment of all structures on the national road network along the haul route.



The Applicant responds that the turbine deliveries will not involve abnormal axle loads but nevertheless accepts that a structural survey will be undertaken at locations along the route, with those locations to be agreed with the relevant road authorities **prior to construction**.

This is another area where substantive verification remains deferred.

The Applicant's statement regarding permissible axle loadings is relevant and materially reduces the potential structural concern. However, abnormal-load movements are not determined solely by gross axle weight. The dimensions, axle configuration, turning movements and repeated passage of specialist transport vehicles remain relevant to the suitability of structures and road infrastructure along the route.

TII's request for a full structural assessment confirms that it considers this verification necessary.

The Commission should therefore distinguish between:

- the Applicant's expectation that existing infrastructure is capable of accommodating the proposed loads; and
- a completed structural assessment confirming that this is actually the case.

At present, the latter has not been provided.

Where a development depends upon the successful delivery of exceptionally large turbine components over a lengthy national and regional road network, confirmation that the required route is physically deliverable is a material component of project feasibility.

Traffic management measures do not resolve route feasibility

The Applicant places substantial reliance on the Traffic Management Plan and on commitments that detailed delivery arrangements will subsequently be agreed with TII, Clare County Council, Limerick City and County Council and An Garda Síochána. Chapter 18 confirms that the final TMP will include delivery programming, temporary traffic controls, local notifications and pre- and post-construction road surveys.

These measures are appropriate and capable of managing the operational consequences of abnormal-load movements.



However, traffic management measures address **how** movements will be managed. They do not establish that every material infrastructure constraint along the route has already been resolved.

That distinction is particularly relevant where TII's review of the TTC remains ongoing and the structural assessment of route infrastructure has yet to be undertaken.

Planning significance

The CLG does not consider that the TII matters presently identified are equivalent in significance to the unresolved aviation, ecology or hydrology issues addressed elsewhere in this submission.

Nevertheless, the Commission should not treat the outstanding matters as purely administrative.

The proposed development depends upon a specific abnormal-load delivery strategy, including the N69 TTC and a defined route to the site. Where that strategy remains subject to further TII review and future structural verification, the Commission should ensure that sufficient certainty exists that the development can be implemented substantially in the form assessed in the EIAR.

Any requirement for material alteration following permission could raise issues regarding the scope of the development previously assessed and the adequacy of public participation.

CLG Conclusion

The Further Information addresses a substantial proportion of the matters raised by Transport Infrastructure Ireland.

The CLG acknowledges in particular that the Applicant has:

- prepared and uploaded the required DN-GEO-03030 Design Report;
- undertaken a Stage 1 Road Safety Audit;
- completed swept-path assessment of the turbine delivery route;
- committed to traffic-management and delivery-programming measures; and
- accepted responsibility for reinstatement of any damage to the road network.

However, two matters remain unresolved at the planning decision stage.



First, TII has advised that its review of the proposed N69 Temporary Transition Compound may require **material changes or alterations**, and the Applicant has not demonstrated that TII has completed that review and accepted the proposed arrangement.

Second, TII considers a full assessment of structures on the national road network along the haul route to be **critical**, yet the Applicant proposes to undertake the relevant structural survey only prior to construction.

Accordingly, the CLG submits that the Commission should be satisfied, before permission is granted, that the proposed turbine delivery strategy is demonstrably achievable without requiring material alterations to the assessed development.

The outstanding TII matters may be capable of resolution and, considered alone, would not necessarily warrant refusal. However, the **acceptability of the N69 Temporary Transition Compound and the structural feasibility of the abnormal-load route should be established with sufficient certainty at the planning stage rather than left wholly to post-consent agreement.**

Response 26 – Clare County Council: Project Splitting and Piecemeal Development

Applicant's Response

Further Information Document FI-1, Section 5.1.1 – *Project Splitting*, p. 88.

The Applicant responds specifically to the concerns raised by **Clare County Council (CCC)** regarding the rationale for separate planning applications for the proposed Knockshanvo Wind Farm and the proposed Oatfield Wind Farm, and CCC's concern that this results in a **piecemeal approach to the development of the wider Strategic Area.**

The Applicant states that Oatfield is:

- an entirely separate project;



- being progressed independently by a different developer;
- subject to separate landowner agreements; and
- unrelated to Knockshanvo other than by reason of geographical proximity.

The Applicant further states that each planning application submitted to a Planning Authority must be assessed on its own merits and in accordance with the planning policy and legislation applicable to that particular application.

The Applicant therefore rejects CCC's concern that the two developments represent an inappropriate piecemeal approach to development of the Strategic Area.

Issue

Whether the Applicant's reliance upon separate developers, separate land agreements and separate planning applications adequately addresses Clare County Council's distinct planning concern that Knockshanvo and Oatfield would amount to **piecemeal development of the same wider Strategic Area**, contrary to the coordinated development approach envisaged by the Clare Wind Energy Strategy.

CLG Assessment

The Applicant's response does not substantively answer the concern raised by Clare County Council.

CCC's concern is not simply whether Knockshanvo and Oatfield are legally separate applications or whether they are promoted by different corporate entities. Its concern is the **planning outcome produced by developing the same upland wind-energy resource through separate, closely adjoining projects rather than through a coordinated approach**.

That distinction is important.

The Applicant responds largely by restating the corporate and procedural separation between the developments. However, legal separation between applicants does not determine whether the physical development of the landscape is piecemeal in planning terms.

The CLG's original submission identifies the relevant provision of the **Clare Wind Energy Strategy (CWES)**, which requires areas designated as Strategic to be developed in a



comprehensive manner and to avoid piecemeal development. The CLG also highlighted that Knockshanvo and Oatfield would together comprise approximately **20 large turbines**, located within the same upland area, with Knockshanvo turbines effectively interwoven with the Oatfield layout.

The Applicant's response does not engage with that substantive policy concern.

Separate applicants do not create separate landscapes

For planning and environmental purposes, the landscape does not distinguish between turbines according to which corporate entity owns them.

The resulting physical environment would comprise the combined presence of the Knockshanvo and Oatfield turbines within the same upland landscape.

The Applicant's own LVIA evidence elsewhere confirms that the two developments:

- occupy the same upland landscape;
- would be viewed within the same visual unit;
- are separated by only approximately 500 m at their closest point; and
- would frequently be experienced together from surrounding receptors.

Accordingly, the physical relationship between the developments is substantially closer than the Applicant's statement that Oatfield bears “no relation” to Knockshanvo other than geographical proximity might suggest.

In this context, **geographical proximity is not incidental**. It is the very reason why CCC's piecemeal-development concern arises.

Duplication of infrastructure is relevant to the planning issue

The CLG's original submission also identified the duplication of infrastructure potentially associated with progressing the developments separately, including access infrastructure, construction compounds, electrical infrastructure and meteorological infrastructure.

The Applicant's response at Section 5.1.1 does not address whether a more coordinated development strategy could have:

- reduced the amount of infrastructure required;
- reduced habitat disturbance;



- reduced construction traffic;
- reduced land take;
- enabled a more coherent turbine layout;
- reduced cumulative landscape effects; or
- facilitated a more integrated environmental assessment.

These are precisely the types of planning consequences that arise from piecemeal development.

The question is therefore not merely whether each proposal can technically be processed as a separate application, but whether the overall development pattern represents the orderly and coordinated development envisaged for a Strategic Wind Energy Area.

The Clare Wind Energy Strategy does not provide unlimited development capacity

The Applicant places substantial reliance elsewhere upon the Strategic Area designation as support for the principle of wind energy development at Knockshanvo.

However, the same Wind Energy Strategy must be read as a whole.

The CLG submission records that the CWES supports wind development:

“in principle and in appropriate scales and locations”

and that its cumulative-impact assessment identified capacity for **medium wind farm developments** within Strategic and Acceptable in Principle areas.

The combined Knockshanvo and Oatfield development would comprise approximately 20 turbines, all of which significantly exceed the CWES definition of a “large” turbine by height.

Accordingly, reliance upon the Strategic Area designation cannot be separated from the Strategy's own provisions regarding scale, cumulative capacity and coordinated development.

If the Applicant seeks the benefit of the Strategic Area designation as a positive planning consideration, it must equally engage with those provisions intended to control how development within that Strategic Area occurs.



Section 5.1.1 does not do so.

CCC's concern carries independent planning weight

The significance of this response also differs from the Applicant's earlier reply to third-party observations on project splitting.

Here, the concern arises from the **Planning Authority itself**, through its Chief Executive's Report under section 37E(4).

CCC expressly queried the rationale for the two separate applications and raised concern that the proposals would result in a piecemeal approach to the wider Strategic lands.

That concern is particularly material because CCC is responsible for the development plan and the Clare Wind Energy Strategy upon which the Applicant itself relies.

The Applicant's response does not demonstrate that CCC has withdrawn or modified that concern. It simply disagrees with it.

The Commission must therefore independently determine whether the development pattern is consistent with the proper planning and sustainable development of the Strategic Area.

Cumulative assessment does not fully answer piecemeal development

The Applicant has repeatedly relied upon cumulative environmental assessment as evidence that separate applications are acceptable.

A cumulative assessment is necessary, but it addresses a different issue.

A technically adequate cumulative assessment may identify the combined environmental effects of two projects, but it does not necessarily establish that the **development strategy itself** is coordinated or represents the optimal planning of the area.

Piecemeal development can create planning inefficiencies and environmental effects even where those effects are subsequently assessed cumulatively.

The Commission must therefore distinguish between:



1. whether Knockshanvo and Oatfield have been cumulatively assessed; and
2. whether progressing them separately represents an appropriate and comprehensive development strategy for the Strategic Area.

The Applicant's response largely addresses the first issue while CCC's concern principally relates to the second.

CLG Conclusion

The Further Information does not satisfactorily address Clare County Council's concern regarding **piecemeal development of the wider Strategic Area**.

The Applicant demonstrates that Knockshanvo and Oatfield are promoted by separate developers under separate land arrangements. However, that does not resolve the planning issue identified by CCC.

The two proposals would physically occupy the same upland landscape, comprise approximately 20 very large turbines in close proximity and collectively determine the future character and development pattern of the Strategic Wind Energy Area.

The Applicant's statement that Oatfield bears no relation to Knockshanvo other than geographical proximity understates the importance of that physical relationship. In planning terms, their geographical and landscape relationship is precisely what makes coordinated assessment and development relevant.

The Applicant also does not adequately address whether progressing the projects separately has resulted in unnecessary duplication of infrastructure or whether a coordinated development approach could have reduced environmental impacts and produced a more coherent use of the Strategic lands.

Accordingly, the CLG submits that the Commission should attach significant weight to the concern raised independently by **Clare County Council**, particularly given that the same Clare Wind Energy Strategy relied upon by the Applicant seeks comprehensive rather than piecemeal development of Strategic Areas.

The Applicant's reliance upon separate corporate ownership and separate planning applications does not, in itself, demonstrate compliance with that planning objective. The potential **piecemeal development of the Knockshanvo/Oatfield uplands therefore remains a material consideration in determining the application**.



Response 27 – Clare County Council: Visual Amenity

Applicant's Response

Further Information Document FI-1, Section 5.1.2 – Visual Amenity, pp. 88–91.

The Applicant responds to the concerns raised by **Clare County Council (CCC)** regarding the landscape and visual effects of the proposed development, including the scale of the turbines, their relationship with the surrounding upland landscape, effects on sensitive receptors and the cumulative interaction with other wind energy development.

The Applicant relies upon Chapter 14 of the EIAR, *Landscape and Visual*, and maintains that the Landscape and Visual Impact Assessment (LVIA) comprehensively assesses the proposed development in accordance with recognised methodology.

The Applicant places particular reliance upon the location of the majority of the proposed turbines within an area identified as **Strategic for wind energy development** under the Clare Wind Energy Strategy, with the remaining turbine located within an area identified as **Acceptable in Principle**.

The Applicant accepts that significant landscape and visual effects will occur at certain locations close to the proposed development but maintains that the occurrence of a significant effect does not, of itself, mean that the effect is unacceptable in planning terms.

The Applicant further relies upon the scale and character of the Slieve Bernagh uplands, existing commercial forestry, topography and vegetation, and maintains that the landscape has sufficient capacity to accommodate the proposed development.

In relation to cumulative effects, the Applicant relies upon the cumulative assessment contained within the LVIA, including consideration of the proposed Oatfield Wind Farm and other existing, permitted and proposed wind farms within the study area.

The Applicant therefore maintains that, notwithstanding localised significant effects, the proposed development is consistent with the Clare Wind Energy Strategy and will not result in an unacceptable effect on landscape character or visual amenity.



Issue

Whether the Applicant has adequately addressed Clare County Council's concerns regarding the visual amenity effects of the proposed development, particularly where significant effects are acknowledged, the proposed turbines are substantially larger than the turbine scale contemplated when the existing Clare Wind Energy Strategy was prepared, and the development would interact closely with the proposed Oatfield Wind Farm within the same upland landscape.

CLG Assessment

The Applicant is correct that identification of a **significant landscape or visual effect** under EIA methodology does not automatically determine that a development must be refused.

Significance and planning acceptability are related but distinct matters.

However, that principle does not diminish the importance of the significant effects identified by the Applicant's own assessment. Rather, once significant effects are identified, the Commission must determine whether those effects are acceptable having regard to the sensitivity of the receiving environment, applicable planning policy, residential and recreational receptors, cumulative development and the overall scale of change proposed.

In this respect, the concerns raised by Clare County Council are particularly important.

Strategic designation does not determine visual acceptability

The Applicant again places substantial weight upon the site's designation under the Clare Wind Energy Strategy.

The CLG accepts that this designation is an important material planning consideration and that wind energy development is supported **in principle** within Strategic areas.

However, designation as a Strategic Area does not establish that every wind farm layout or turbine scale is acceptable.

The Clare Renewable Energy Strategy itself seeks to maximise renewable-energy development while **safeguarding the environment and existing residential amenities**.



Accordingly, the strategic designation cannot properly be used as a substitute for assessing the actual landscape and visual consequences of the development now proposed.

This is especially important because the proposed turbines would reach approximately **185 m tip height**. The scale of modern turbines is materially greater than that prevailing when the original wind-energy landscape strategy was formulated.

The Commission must therefore determine whether the specific development now proposed can be accommodated, rather than treating the Strategic designation as establishing landscape capacity irrespective of turbine dimensions.

The Applicant acknowledges significant effects

The Applicant's position that significant effects are not necessarily unacceptable is technically correct, but it should not obscure the substantive findings of the LVIA.

The development would introduce nine exceptionally large vertical structures into the 12 O'Clock Hills. The CLG repeat the earlier point that whilst the 12 O'Clock Hills nominally form part of the Slieve Bernagh range, they are geographically separate and at a lower elevation to the main range. At locations close to the site, these structures would fundamentally alter the character and composition of existing views.

The planning question is therefore not whether significant effects are legally permissible in principle. It is whether the **particular significant effects identified in this case** represent an acceptable change to the landscape.

CCC's concern demonstrates that the Planning Authority itself has reservations regarding that question.

This carries particular weight because Clare County Council is responsible for the Development Plan and the landscape and wind-energy policies upon which the Applicant relies.

Landscape capacity must be distinguished from wind-energy policy

As considered previously in relation to landscape sensitivity, the Applicant's assessment is materially influenced by the area's wind-energy designation and by the presence of commercial forestry.



However, the underlying characteristics of these uplands include their elevation, remoteness and panoramic relationship with the surrounding landscape.

Commercial forestry modifies the landcover, but it does not remove those underlying landscape characteristics.

Nor is commercial forestry permanent in visual terms. Forestry is subject to rotational felling and replanting, meaning that the degree of screening and the visual character of individual areas change substantially over time.

By contrast, turbines approaching 185 m in height would remain prominent vertical elements throughout their operational life.

The Applicant's reliance upon forestry and vegetation as factors limiting visual exposure must therefore be considered in that context.

Residential receptors

The visual effects upon residential receptors are also relevant to CCC's concern.

The Applicant maintains that no dwelling would experience an effect reaching the threshold of unacceptable residential visual amenity.

However, the absence of an effect sufficiently extreme to render a dwelling an unattractive place in which to live does not mean that substantial visual effects upon residential amenity are irrelevant.

The Residential Visual Amenity Assessment threshold represents an exceptionally high threshold.

Below that threshold, significant visual effects can still constitute material planning effects upon residents and their enjoyment of their properties.

The Commission should therefore consider the overall degree of visual change experienced by surrounding communities rather than relying solely upon whether any individual dwelling reaches the highest RVAA threshold.

The Oatfield relationship materially increases the visual concern

The cumulative relationship with the proposed Oatfield Wind Farm is particularly important.



As already addressed in the landscape and cumulative responses, the Applicant's own assessment acknowledges that Knockshanvo and Oatfield would occupy the **same upland landscape and visual unit**, would be separated by approximately 500 m at their closest point and would frequently be visible together.

In some views, the Applicant's LVIA describes the Knockshanvo turbines as effectively being absorbed amongst the Oatfield turbines, resulting in the developments appearing as a collective turbine cluster.

This is directly relevant to CCC's visual-amenity concern.

The Commission is not assessing whether these uplands can accommodate nine Knockshanvo turbines in this location. It must consider the actual cumulative environment which could arise if the relevant existing, permitted and proposed developments proceed.

In that scenario, Knockshanvo and Oatfield would together comprise approximately **20 very large turbines concentrated within the same upland area**.

The resulting visual effect would therefore represent a substantially greater transformation of the upland landscape than is conveyed by consideration of Knockshanvo solely as an individual nine-turbine development.

Relationship with CCC's concern regarding piecemeal development

RR-26 and RR-27 are closely related.

CCC's concern regarding piecemeal development is not simply procedural. One of the consequences of progressing Knockshanvo and Oatfield as separate but immediately adjoining developments is that the combined landscape outcome may not reflect a single coordinated design strategy.

A comprehensive development approach could potentially consider turbine numbers, spacing, scale, infrastructure and landscape composition across the Strategic Area as a whole.

By contrast, separate projects designed around separate land interests can produce a cumulative layout determined substantially by project boundaries rather than by the optimal landscape design of the overall upland area.

The Applicant's reliance upon cumulative assessment does not fully address this issue.



Assessing the cumulative effect of two separately designed wind farms is not equivalent to demonstrating that their combined layout represents an appropriate coordinated design for the landscape.

CLG Conclusion

The Further Information does not satisfactorily resolve Clare County Council's concerns regarding visual amenity.

The CLG accepts that the majority of the proposed development lies within an area identified as Strategic for wind energy development and that this designation is an important material consideration.

However, strategic support for wind energy **in principle** does not establish that nine turbines approaching 185 m in height are acceptable in this particular configuration or that the landscape has unlimited capacity to accommodate further development.

The Applicant itself acknowledges that **significant landscape and visual effects will occur**. Its response is principally that significant effects are not necessarily unacceptable and that the Strategic Area designation demonstrates an underlying capacity for wind energy development.

The Commission must go further and determine whether the actual significant effects identified are acceptable in the circumstances of this site.

Particular weight should be given to the cumulative relationship with Oatfield. The two developments would occupy the same upland landscape and visual unit and, if both proceeded, would result in approximately 20 very large turbines concentrated across the landscape.

The concern is therefore not simply the visibility of individual turbines but the **degree of transformation of the overall upland landscape**.

Accordingly, the CLG submits that the Applicant's reliance upon the Strategic wind-energy designation does not satisfactorily answer the visual-amenity concerns raised by Clare County Council. The scale of the turbines, acknowledged significant effects, impacts upon surrounding receptors and the close cumulative relationship with Oatfield remain **material considerations which weigh against the conclusion that the proposed development can be satisfactorily absorbed into the receiving landscape**.



Response 28 – Clare County Council: Noise

Applicant's Response

Further Information Document FI-1, Section 5.1.3 – Noise, pp. 91–92, with the detailed technical response provided by AWN Consulting in FI-2, Appendix 3.

Clare County Council raises concern regarding noise generated by the proposed Knockshanvo Wind Farm and the adjoining proposed Oatfield Wind Farm and the implications of that combined noise environment for the residential amenities of the area.

The Applicant responds by referring the noise matters raised by CCC to the specialist response prepared by **AWN Consulting**. It states that a comprehensive cumulative impact assessment was undertaken for the proposed development and that this assessment included all relevant wind farms, specifically including the adjoining proposed Oatfield Wind Farm.

The Applicant maintains that the operational noise assessment has been undertaken in accordance with the applicable wind turbine noise guidance and that predicted noise levels, including cumulative contributions from other relevant wind farms, can comply with the applicable noise criteria.

The Applicant therefore rejects the proposition that the combined operation of Knockshanvo and Oatfield would result in an unacceptable noise effect upon surrounding residential receptors and relies upon the AWN assessment and operational noise controls to demonstrate compliance.

Issue

Whether the Applicant has adequately addressed Clare County Council's concern regarding the cumulative noise effects of Knockshanvo and the immediately adjoining Oatfield Wind Farm upon residential amenity, particularly where both developments would operate within the same locality and the Applicant's conclusion depends upon the adequacy of its background-noise methodology, cumulative modelling assumptions and operational noise limits.



CLG Assessment

The Applicant's response to Clare County Council is brief and relies almost entirely upon the more detailed technical assessment prepared by AWN.

The CLG accepts that Oatfield has been included within the cumulative noise assessment. The issue is therefore not an outright omission of the adjoining wind farm.

The material question is whether the cumulative assessment provides sufficient certainty that residents will be adequately protected from the **combined operational noise environment** if both developments proceed.

The proximity of Oatfield makes cumulative noise a central issue

The relationship between Knockshanvo and Oatfield is fundamentally different from that between two geographically remote wind farms whose noise emissions have little or no interaction at individual receptors.

The two proposed developments occupy the same upland area and would together comprise approximately 20 large wind turbines.

The Applicant itself recognises this relationship by expressly including Oatfield within its cumulative assessment.

Accordingly, the Commission must assess the noise environment that could actually be experienced by residents if both developments become operational.

It is not sufficient merely to demonstrate that the Knockshanvo contribution, considered separately, can remain within an allocated component of the applicable noise limit.

The relevant planning consideration is the **total cumulative wind turbine noise exposure at the receptor**.

Compliance depends upon the robustness of the underlying background-noise assessment

The Applicant's conclusion of compliance is dependent upon the background-noise environment against which permissible turbine noise levels are derived.



This is particularly important under the methodology relied upon by the Applicant because the applicable operational limits may vary according to measured background noise.

Accordingly, uncertainty regarding background-noise measurements, monitoring locations, data filtering or the representativeness of the derived background-noise curves has direct implications for the resulting operational limits.

These matters are not theoretical. They form the subject of detailed responses within the AWN Further Information and are separately identified as material technical issues, including the **background-noise survey**, treatment of the **Sunyata Buddhist Centre**, identification of **noise-sensitive locations**, and **low-frequency noise and infrasound**.

The Applicant's response to CCC cannot therefore be considered independently of those underlying technical matters.

If the baseline upon which the limits are derived is uncertain, the cumulative compliance conclusion is correspondingly uncertain.

Cumulative compliance must be enforceable in practice

There is also an important distinction between demonstrating theoretical cumulative compliance within an acoustic model and ensuring compliance throughout the operational lifetime of two separately controlled wind farms.

Knockshanvo and Oatfield are being advanced as separate projects by separate developers.

Yet the noise experienced by a resident will be the combined acoustic output of turbines irrespective of ownership.

This creates a practical enforcement issue.

Where a cumulative noise limit is approached or exceeded at a dwelling, it must be possible to determine the contribution attributable to each wind farm and to secure the operational changes necessary to restore compliance.

The Applicant's position elsewhere is that Knockshanvo and Oatfield are entirely separate developments. That corporate separation cannot be relied upon for project-splitting purposes while simultaneously assuming seamless cumulative operational management where necessary to protect residents from noise.



The Commission must therefore be satisfied that any cumulative noise regime would be **practically enforceable**, including circumstances where both wind farms contribute materially to the measured noise level.

Residential amenity involves more than numerical compliance

CCC specifically raises the implications of noise for the **residential amenities of the area**.

This is significant because the planning assessment should not be reduced solely to whether a calculated numerical limit can technically be met.

Noise criteria provide an essential regulatory benchmark, but the Commission must also consider the nature and character of the resulting change to the acoustic environment experienced by residents.

The introduction of operational turbine noise into a rural environment, particularly from two closely adjoining wind farms, represents a long-term change in environmental conditions.

This does not mean that any audible turbine noise is unacceptable. It does mean that the acceptability of the development should be considered in the context of the existing rural acoustic environment, the number and proximity of turbines, cumulative exposure and the duration of the proposed operation.

The age of the principal guidance remains relevant

As addressed under RR-24, the Applicant relies principally upon the existing wind turbine noise assessment framework while rejecting the direct applicability of the WHO Environmental Noise Guidelines 2018.

The CLG accepts that the **2006 Wind Energy Development Guidelines remain the applicable statutory planning guidance**.

However, the age of those Guidelines remains a relevant consideration where the Commission is assessing the adequacy of protection afforded to residential receptors by modern turbines of substantially greater scale.

The HSE's separate public-health observation reinforces the need to consider contemporary evidence alongside formal compliance with the existing planning guidance.



Accordingly, CCC's concern regarding residential amenity cannot be answered solely by stating that the acoustic model predicts compliance with the existing numerical framework.

Reliance upon operational controls confirms the importance of enforceability

The Applicant relies upon AWN's assessment and **operational controls** in maintaining that the development will comply with applicable noise requirements.

Operational curtailment can, in principle, provide an effective mechanism for controlling wind turbine noise.

However, where curtailment is necessary to secure compliance, the relevant operating modes and limits must be clearly defined, enforceable and capable of responding to the cumulative contribution of Oatfield.

The Commission should not rely upon a general commitment that turbines can subsequently be operated in reduced-noise modes without certainty regarding:

- the receptors at which cumulative compliance must be achieved;
- the applicable cumulative limits;
- the contribution permitted from Knockshanvo;
- monitoring and verification arrangements;
- procedures for investigating complaints or exceedances; and
- the operational measures required where cumulative limits are exceeded.

These matters are particularly important where two independently operated wind farms could contribute to the same cumulative noise environment.

CLG Conclusion

The Further Information confirms that the Applicant has included the proposed Oatfield Wind Farm within its cumulative noise assessment. The CLG therefore does not contend that Oatfield has simply been omitted from the Applicant's modelling.

However, the concerns raised by Clare County Council are not resolved merely by demonstrating that a cumulative calculation has been undertaken.



The acceptability of the Applicant's conclusion depends upon the robustness of the **underlying background-noise data, receptor selection, modelling assumptions and operational noise criteria**, several of which are themselves the subject of substantive Further Information responses.

The close physical relationship between Knockshanvo and Oatfield is particularly important. If both developments proceed, surrounding residents will experience a **single cumulative acoustic environment**, irrespective of the fact that the projects have separate developers and separate planning permissions.

Accordingly, the Commission must be satisfied not only that theoretical cumulative compliance can be modelled but that the applicable cumulative limits can be **effectively monitored and enforced throughout the operational life of both developments**.

The CLG therefore submits that the Applicant's general reliance upon the AWN assessment and operational controls does not, by itself, satisfactorily resolve Clare County Council's concern regarding cumulative noise and residential amenity.

The matter should be considered together with the detailed technical issues concerning background noise, sensitive receptors, low-frequency noise and public health. Until those underlying matters are satisfactorily resolved, the Applicant's conclusion that the combined Knockshanvo/Oatfield noise environment will be acceptable remains insufficiently demonstrated.

Response 29 – Clare County Council: Roads and Traffic

Applicant's Response

Further Information Document FI-1, Section 5.1.4 – Road and Traffic Issues, pp. 92–93.

The Applicant responds to concerns raised by **Clare County Council (CCC)** regarding the effects of construction traffic on the local road network, the interaction between wind farm construction traffic and forestry operations, the condition and capacity of



local roads, and the management of works required along the proposed construction and turbine delivery routes.

The Applicant maintains that the traffic and transport effects of the proposed development have been comprehensively assessed in Chapter 15 of the EIAR and associated appendices. It relies upon the proposed Traffic Management Plan, traffic-control measures, road improvement works and pre- and post-construction road condition surveys to demonstrate that construction traffic can be accommodated without unacceptable effects on the local road network.

In relation to forestry activity, the Applicant states that forestry-related traffic has been considered within the assessment and that interaction between forestry operations and construction traffic can be managed through appropriate scheduling and traffic management.

The Applicant further maintains that any necessary works to local roads will be undertaken in consultation with Clare County Council and that the detailed arrangements can appropriately be agreed prior to construction and secured by planning condition.

The Applicant therefore concludes that the local-road and traffic impacts identified by CCC are temporary and manageable and do not constitute a reason to refuse permission.

Issue

Whether the Applicant has demonstrated that the local road network can safely and satisfactorily accommodate the scale and duration of construction traffic associated with the proposed development, including concurrent forestry traffic, and whether sufficient detail has been provided at the planning stage regarding necessary road works and traffic-management measures rather than leaving material elements for post-consent agreement.

CLG Assessment

The CLG accepts that construction traffic impacts are, by their nature, principally temporary and that appropriate traffic-management measures can substantially reduce their effects.



The Applicant has also undertaken a specific traffic and transport assessment and proposes measures including traffic management, delivery scheduling, road condition surveys and reinstatement.

The issue is therefore not whether construction traffic can be managed at all. It is whether the evidence before the Commission provides sufficient certainty that the particular local road network serving Knockshanvo can accommodate the scale and characteristics of the proposed construction activity without unacceptable effects upon road safety, road condition and local road users.

The local road network is a material constraint

The proposed development is located within an upland rural area served substantially by local roads which were not designed for the scale and frequency of heavy construction traffic associated with a major wind energy development.

The construction phase would involve substantial movements associated with:

- turbine components;
- stone and aggregate;
- concrete;
- construction plant;
- electrical infrastructure;
- crane mobilisation;
- excavated and construction materials; and
- construction personnel.

The effect therefore extends beyond the relatively limited number of abnormal turbine-component deliveries.

The repeated movement of conventional HGV construction traffic over the local road network is potentially more significant in terms of road deterioration, interaction with local traffic and disruption over the overall construction period.

The Applicant's reliance upon traffic management does not remove the need to establish that the underlying road infrastructure is suitable for those movements.



Forestry traffic creates an additional cumulative consideration

CCC's concern regarding forestry traffic is particularly relevant given the extensive commercial forestry within and surrounding the proposed development site.

Forestry operations generate heavy vehicle movements independently of the proposed wind farm.

The Applicant maintains that interaction between forestry and wind farm construction traffic can be addressed through scheduling and traffic-management arrangements.

That may be possible operationally. However, it assumes a degree of control over forestry operations occurring within the wider area throughout the construction period.

The Commission should therefore distinguish between forestry operations directly under the Applicant's control and activities undertaken independently by other forestry interests.

Where the Applicant does not control the timing of third-party forestry movements, reliance upon future coordination cannot provide complete certainty that simultaneous heavy traffic movements will not occur.

The appropriate assessment should therefore consider a reasonably foreseeable scenario in which forestry traffic and wind farm construction traffic occur concurrently rather than assuming that the two activities can always be separated by scheduling.

Updated traffic-count evidence

The Further Information package includes **updated full-day classified traffic-count evidence** for Broadford and other locations along the proposed route.

This additional evidence strengthens the Applicant's assessment and should be acknowledged.

However, traffic capacity in conventional junction terms is only one aspect of the issue.

A rural road can have relatively low existing traffic volumes and therefore appear to possess substantial theoretical traffic capacity while still presenting constraints in terms of:

- carriageway width;



- horizontal and vertical alignment;
- structural condition;
- visibility;
- pedestrian and cyclist interaction;
- passing opportunities; and
- suitability for repeated HGV movements.

Accordingly, low baseline traffic flows do not themselves demonstrate that the local road network is physically suitable for the proposed construction traffic.

Road condition and reinstatement

The Applicant proposes pre-construction road condition surveys and accepts responsibility for reinstatement of damage attributable to construction traffic.

The CLG considers this appropriate and necessary.

However, reinstatement after damage has occurred does not fully address the potential effect during construction.

If deterioration creates potholes, edge failure or other road-safety problems while the construction programme is ongoing, residents and other road users may experience the consequences before final reinstatement takes place.

Any traffic-management and road-maintenance regime would therefore require an obligation for **ongoing inspection and prompt repair throughout construction**, rather than merely pre- and post-construction surveys.

This is particularly important given the duration and intensity of heavy vehicle movements anticipated.

Post-consent agreement should be confined to implementation detail

The Applicant proposes that detailed arrangements concerning local-road works and traffic management can be agreed with Clare County Council prior to construction.

There is nothing inherently inappropriate about detailed construction traffic arrangements being finalised with the roads authority following permission. Matters such as exact delivery times, temporary signage and individual traffic-control arrangements are commonly dealt with at that stage.



However, a distinction must be maintained between **implementation detail** and the resolution of a material road constraint.

The Commission should be satisfied at the planning stage that:

- the proposed routes are physically capable of accommodating the anticipated traffic;
- all material road widening or improvement works have been identified;
- those works fall within the development assessed in the EIAR;
- the Applicant possesses or can obtain the necessary control to undertake them; and
- no material redesign of the construction route will subsequently be required.

A planning condition should not become the mechanism by which the fundamental feasibility of the route is determined after permission has already been granted.

Relationship with RR-25

The concerns raised by CCC should also be considered alongside **RR-25 – TII / National Road and Turbine Delivery Route Matters**.

The TII response concerns principally the national-road network, the N69 Temporary Transition Compound and structural assessment of the abnormal-load route.

The present response concerns the local road network within County Clare.

Together, these demonstrate that the overall construction and turbine delivery strategy remains dependent upon several layers of road-authority approval and detailed pre-construction verification.

None of those matters necessarily establishes that the development is incapable of implementation. However, taken together they reinforce the need for the Commission to ensure that the transport strategy is sufficiently developed at the planning stage and does not depend upon material changes following consent.

Broadford Wastewater Scheme – additional foreseeable construction activity

A further material development has emerged regarding the future use of the road network through Broadford.



The Broadford wastewater scheme was approved to progress under the Government programme for unsewered towns and villages. More recent information published in June 2026 confirms that Uisce Éireann is progressing the project, with design work advancing and contractor procurement and appointment expected in **2027**.

This timing is directly relevant to the proposed Knockshanvo construction programme.

The Applicant's traffic assessment adopts **2028 as the future construction-year scenario**, forecasting background traffic from the 2023 baseline principally through the application of TII traffic-growth factors.

The CLG has been unable to identify the Broadford wastewater scheme as a specific project within the Applicant's cumulative construction traffic assessment.

This is potentially significant. The wastewater scheme will require construction works and associated vehicle movements and is likely to involve works within the local road network. The precise construction programme, road-opening requirements and traffic volumes will depend upon the final design and procurement process and should not be assumed at this stage. Nevertheless, the confirmation that contractor appointment is expected in 2027 creates a realistic possibility that wastewater infrastructure works could coincide with, or occur close in time to, the Applicant's assumed 2028 wind farm construction period.

Recent local evidence also demonstrates existing concerns regarding the condition and operation of the road network through Broadford. In June 2026, local residents publicly raised concerns regarding poor road surfacing, potholes, speeding and pedestrian safety. The same report records existing morning congestion involving school buses and HGV traffic and states that the proposed wastewater scheme has itself been cited as a reason for delaying more substantial road works in the village.

The issue is not whether these matters establish that the Knockshanvo construction traffic cannot be accommodated. Rather, they demonstrate that the future traffic environment cannot necessarily be represented solely by applying general background growth factors to historic traffic counts.

A specific, foreseeable infrastructure project affecting Broadford's road network is now progressing towards delivery within broadly the same period used by the Applicant for its wind farm construction assessment.

The Commission should therefore be satisfied that the cumulative traffic assessment adequately considers the potential interaction between:



- Knockshanvo construction traffic;
- Oatfield and other relevant development traffic;
- the Broadford wastewater scheme;
- road-opening and temporary traffic-management requirements associated with that scheme;
- existing HGV and school traffic through Broadford; and
- the existing road-condition and pedestrian-safety constraints within the village.

If the programme and traffic implications of the wastewater scheme are not yet sufficiently defined to allow precise modelling, that uncertainty should be recognised rather than treating the project as if it does not exist.

In the CLG's view, the recent confirmation that the Broadford wastewater scheme is progressing towards contractor appointment in 2027 represents material new information which should be taken into account before the Commission accepts the Applicant's conclusion that cumulative construction traffic effects on Broadford will not be significant.

CLG Conclusion

The Further Information provides a substantive response to Clare County Council's roads and traffic concerns, and the additional traffic-count evidence strengthens the baseline assessment.

The CLG also accepts that many construction traffic effects are temporary and can be reduced through appropriate traffic management, delivery scheduling, road maintenance and reinstatement.

However, important uncertainties remain regarding the **cumulative demands on the local road network during the proposed construction period.**

In particular, the Broadford wastewater scheme is now progressing towards delivery, with contractor appointment expected in 2027. This creates a realistic possibility that associated construction works, road openings, traffic management and construction traffic could coincide with, or occur close in time to, the Applicant's assumed 2028 wind farm construction period. The CLG has been unable to identify this project as having been specifically considered in the Applicant's cumulative traffic assessment.

This is relevant in the context of existing concerns regarding road condition, HGV movements, school traffic and pedestrian safety through Broadford.



Particular consideration must also be given to the cumulative interaction with commercial forestry traffic. Where wastewater construction activity, forestry operations or other third-party traffic is outside the Applicant's control, it cannot simply be assumed that potentially conflicting heavy vehicle movements can always be avoided through scheduling.

The Applicant's reliance upon future agreement with Clare County Council should therefore be confined to detailed implementation measures and should not substitute for demonstrating the fundamental suitability and capacity of the proposed road network at the planning stage.

The Commission should also require any road-maintenance regime to provide for ongoing inspection and prompt repair during construction, rather than relying solely upon pre- and post-construction road-condition surveys.

Accordingly, the CLG submits that the Further Information does not yet provide sufficient certainty regarding cumulative construction traffic effects. Before permission is granted, the Commission should be satisfied that all material road works and foreseeable concurrent construction activity — including the progressing Broadford wastewater scheme — have been appropriately considered, and that subsequent agreement with the roads authority will concern implementation detail rather than the resolution of fundamental route, capacity or infrastructure constraints.

Response 30 – Clare County Council: Hen Harrier & Cumulative Effects

Applicant's Response

Further Information Document FI-1, Section 5.1.5 – *Hen Harrier*, pp. 93–97.

The Applicant responds to concerns raised by **Clare County Council (CCC)** regarding both the efficacy of the proposed Hen Harrier biodiversity enhancement measures and the adequacy of the cumulative assessment of wind energy development affecting Hen Harrier within the East Clare uplands.



In relation to the effectiveness and implementation of the proposed compensation and enhancement measures, the Applicant refers back to its response to the Department of Housing, Local Government and Heritage at Section 4.2.2.3 and relies upon the compensation and enhancement package considered under RR-23.

In relation to cumulative effects, the Applicant relies upon the species-specific cumulative assessment contained in **Section 7.11 of the EIAR**. It states that the assessment considered predicted effects from surrounding developments upon shared key ornithological receptors and their habitats, the ecological value of the habitats concerned and the proposed offsetting and enhancement measures.

The Applicant states that:

“no significant residual additive, antagonistic or synergistic effects were identified.”

The Applicant also provides an updated list of wind farms within **25 km** of the proposed development. This records, among others:

- Oatfield – proposed, 11 turbines, approximately **500 m** from Knockshanvo;
- Fahybeg – permitted, 8 turbines, approximately **4.3 km**;
- Ballycar – proposed, 12 turbines, approximately **4.8 km**;
- Lackareagh – permitted, 7 turbines, approximately **5 km**.

The Applicant updates the status of Fahybeg and Lackareagh from “Proposed” to “Permitted” and Knockballynameath from “Permitted” to “Operational”.

The Applicant ultimately maintains that, having regard to the ornithological assessment, the ecological value of the affected habitats and the proposed compensation and enhancement measures, Knockshanvo will not result in significant cumulative effects on Hen Harrier.

It states that successful implementation of the proposed comprehensive compensation and enhancement plan will ensure that Knockshanvo avoids any future contribution to a significant cumulative effect, particularly in respect of Hen Harrier within the local uplands, and concludes that **no significant cumulative effects are predicted**.

Issue

Whether the Applicant has demonstrated that Knockshanvo will not contribute to a significant cumulative effect upon Hen Harrier when considered together with the substantial concentration of existing, permitted and proposed wind energy development



within the East Clare uplands, particularly where the Applicant's conclusion depends materially upon the successful future implementation of habitat compensation and enhancement measures.

CLG Assessment

The Applicant's Further Information confirms rather than diminishes the significance of the cumulative Hen Harrier issue.

The updated information demonstrates that Knockshanvo would be developed within a landscape containing a substantial concentration of existing, permitted and proposed wind farms, several of which are located within approximately 5 km of the proposed development.

Most significantly, the proposed **Oatfield Wind Farm is only approximately 500 m from Knockshanvo and comprises a further 11 turbines.**

The Commission must therefore consider the effects upon Hen Harrier at the scale at which the species actually uses the landscape rather than treating the administrative boundaries of individual wind farm developments as ecologically determinative.

The updated planning status increases rather than reduces the cumulative concern

The Applicant updates the cumulative assessment to recognise that **Fahybeg and Lackareagh have progressed from proposed to permitted developments**, while Knockballynameath has become operational.

This is material.

The cumulative scenario upon which the Commission must determine the Knockshanvo application is consequently more developed than when the original EIAR assessment was prepared.

The progression of projects from proposed to permitted status increases the degree of certainty that additional wind energy infrastructure may form part of the future receiving environment.

The Applicant nevertheless maintains its original conclusion that no significant cumulative effects will arise.



The CLG considers that the mere updating of development status without corresponding reconsideration of the ecological consequences does not demonstrate that the original significance conclusion remains robust.

The Commission must consider what the progressive development of these wind farms means for the **total amount, distribution and connectivity of habitat remaining functionally available to Hen Harrier**.

The 25 km list demonstrates the scale of development pressure

The Applicant's own table demonstrates the extent of wind energy development affecting the wider landscape.

Knockshanvo cannot therefore be assessed as an isolated nine-turbine development surrounded by extensive unaffected alternative habitat.

The relevant landscape contains multiple wind farms at different stages of the planning and operational process.

For a wide-ranging species such as Hen Harrier, this creates the potential for cumulative:

- habitat loss;
- displacement;
- disturbance;
- fragmentation of foraging areas;
- changes in habitat connectivity; and
- collision risk.

These effects may occur even where each individual development is assessed as having a limited project-specific effect.

The fundamental cumulative question is whether the **combined reduction in the availability and quality of the wider landscape** remains compatible with maintaining the local Hen Harrier population.

The Applicant's Further Information does not provide a new landscape-scale analysis quantifying that combined loss of functional habitat.



Reliance upon individual project EIAR conclusions risks circularity

The Applicant states that its cumulative assessment considered the reported effects identified in the EIS/EIAR documentation for surrounding wind farms.

That is an accepted starting point for cumulative assessment, but it requires caution.

If each individual wind farm concludes that its own effect upon Hen Harrier is not significant because substantial alternative habitat remains elsewhere in the uplands, and the Knockshanvo assessment then relies upon those individual project conclusions to determine that the combined effect is also insignificant, there is a risk of **circular assessment**.

The cumulative assessment must examine the resulting environmental condition after the effects of all relevant developments are combined.

It should not simply aggregate the individual developers' conclusions that their respective effects are insignificant.

This is particularly important where several developments may be affecting habitat used by the same local population.

The Applicant's conclusion is dependent upon successful compensation

The Applicant's own wording is particularly important.

It states that:

“the successful implementation of the proposed comprehensive compensation and enhancement plan ensures the proposed Wind Farm Site avoids any future contribution to a significant cumulative effect”

on Hen Harrier.

The habitat-loss calculation introduces further uncertainty

The Applicant's reliance upon successful compensation is particularly important because the quantum of habitat loss being compensated is itself dependent upon assumptions concerning the future availability of forestry habitat.



The Applicant predicts **58.57 ha of Hen Harrier foraging habitat loss through displacement**. In responding to the Department's query as to why this is substantially less than the combined area represented by 250 m around each of the nine turbines, the Applicant explains that commercial forestry is suitable for Hen Harrier only during particular stages of the forestry cycle. It states that Coillte felling plans were therefore used:

“to determine the average amount of potentially available hen harrier habitat over the operational phase of the wind farm.”

This explanation raises an important issue which is not resolved by the Further Information.

The 58.57 ha figure appears to represent an **average amount of potentially suitable habitat affected over the operational life of the development**, rather than necessarily the maximum amount of suitable habitat that could be unavailable through turbine displacement at any particular stage of the forestry cycle.

Hen Harrier do not, however, experience habitat availability as an average calculated across the operational life of a wind farm. Habitat availability varies through successive breeding seasons as forestry is felled, replanted and progresses towards canopy closure.

The Commission should therefore be satisfied that the compensation requirement has not been dimensioned solely against an operational average where the actual amount of suitable habitat rendered unavailable through displacement could be materially greater during particular periods.

This is especially relevant because the Applicant's cumulative conclusion expressly depends upon the **successful implementation of the compensation and enhancement plan**. If the 58.57 ha figure does not represent the maximum functional habitat loss occurring during relevant periods of the forestry cycle, the adequacy of the compensation package requires further examination.

A second uncertainty concerns the spatial extent of displacement.

The Applicant assumes **100% avoidance within 250 m of turbines** for the purpose of calculating habitat loss. However, the research relied upon by the Applicant is also described as reporting a **52.5% reduction in Hen Harrier activity within 500 m of operating turbines**, with significant avoidance within 250 m.



The use of a 250 m radius for calculating complete displacement should not therefore be interpreted as demonstrating that displacement effects cease immediately beyond that distance.

The Further Information does not clearly quantify the functional reduction in habitat use potentially occurring between **250 m and 500 m**, or demonstrate how that reduced activity has been reflected in the overall assessment of habitat availability and cumulative effects.

The Commission should therefore consider the uncertainty inherent in both:

- the use of an **average habitat-loss figure across the forestry rotation**; and
- the treatment of the **250 m displacement distance as the basis for quantifying habitat loss despite evidence of reduced activity extending to 500 m**.

These matters are directly relevant to the Applicant's assertion that:

“the successful implementation of the proposed comprehensive compensation and enhancement plan ensures the proposed Wind Farm Site avoids any future contribution to a significant cumulative effect”

on Hen Harrier.

Where that cumulative conclusion depends upon compensation successfully counterbalancing habitat loss, the Commission must first be satisfied that the **underlying habitat loss has itself been adequately and conservatively quantified**.

The cumulative conclusion is therefore expressly dependent upon the **successful implementation** of the compensation and enhancement measures.

As addressed under RR-23, however, uncertainty remains regarding the ecological equivalence, additionality, timing and effectiveness of those measures.

The Applicant predicts **58.57 ha of Hen Harrier foraging habitat loss through displacement**, proposes 54.2 ha of direct compensation through forestry removal and peatland restoration, and relies additionally upon 46.5 ha of farmland enhancement.

The CLG considers that the adequacy of these measures cannot be established unless the full extent of functional habitat loss has first been reliably quantified. As discussed below, significant uncertainty remains regarding the Applicant's calculation of the 58.57 ha habitat-loss figure, including its reliance on an average amount of potentially available habitat over the operational phase and its treatment of displacement beyond



250 m. This is particularly important because the Applicant's conclusion that the proposed development will avoid any future contribution to a significant cumulative effect expressly depends upon the successful implementation of the compensation and enhancement measures. If the underlying habitat loss has been underestimated, the adequacy of the compensation and enhancement package, and consequently the cumulative-effect conclusion that relies upon it, cannot be assumed.

The cumulative significance conclusion therefore depends upon future habitat-management measures successfully replacing or improving habitat function.

If those measures do not achieve the predicted ecological outcomes, the basis upon which the Applicant excludes a significant cumulative effect is weakened.

This is particularly important because compensation does not eliminate the original impact. It seeks to provide an ecological benefit elsewhere sufficient to counterbalance that impact.

The Commission must therefore be satisfied that the compensation is sufficiently certain before relying upon it to exclude cumulative significance.

The Oatfield relationship requires particular scrutiny

The Applicant's cumulative assessment identifies Oatfield as a proposed 11-turbine wind farm only approximately **500 m** from Knockshanvo.

This exceptionally close relationship means that the two projects would affect substantially the same upland landscape.

For Hen Harrier, the relevant question is therefore not simply whether the Knockshanvo turbine footprint overlaps the Oatfield turbine footprint. It is whether the combined presence of approximately **20 turbines and their associated infrastructure** would reduce the extent or quality of the landscape available for breeding, foraging and movement.

This issue is particularly significant where displacement from operating turbines forms part of the predicted ecological effect.

Separate project boundaries do not create separate displacement environments for birds.



The Commission must therefore examine the combined spatial extent of potential displacement associated with both developments.

The Applicant's statement that no significant additive, antagonistic or synergistic effects are predicted does not, without transparent landscape-scale analysis of the resulting habitat availability, satisfactorily demonstrate that the combined effect is insignificant.

Hen Harrier conservation requires a landscape-scale approach

The underlying difficulty with the Applicant's response is that the cumulative issue is approached substantially through project-level impact conclusions and project-level compensation.

Hen Harrier ecology operates at a substantially wider spatial scale.

The Commission should therefore determine:

whether sufficient suitable and undisturbed foraging habitat will remain available to the relevant Hen Harrier population if Knockshanvo, Oatfield and the other relevant permitted developments proceed.

That question cannot be answered solely by demonstrating that each project has an individual mitigation or compensation package.

The relevant endpoint is the **condition of the resulting landscape available to the species**.

The Further Information does not demonstrate, through a consolidated habitat analysis, the total area of Hen Harrier habitat potentially lost, displaced or otherwise affected across the relevant wind farm developments and the corresponding quantity, location, quality and security of genuinely additional compensatory habitat.

Without that information, the conclusion that no significant cumulative effect will arise remains insufficiently demonstrated.

Adequacy of the 250 m Displacement Assumption and Wider Functional Habitat Loss

A material uncertainty remains as to whether the Applicant's **58.57 ha Hen Harrier habitat-loss figure** adequately represents the full functional habitat loss arising from



the proposed development and, consequently, whether the proposed compensation and enhancement measures have been dimensioned against the correct underlying loss metric.

The Applicant calculates the 58.57 ha figure on the basis of assumed **100% displacement from suitable habitat within 250 m of the proposed turbines**, taking account of the changing availability of suitable forestry habitat over the operational period.

The Applicant relies upon Pearce-Higgins et al. (2009) as part of the scientific basis for its displacement assessment. However, it is important to distinguish between the findings reported in that study and the assessment assumption subsequently adopted by the Applicant.

Pearce-Higgins et al. did **not** report 100% Hen Harrier avoidance within 250 m. Rather, the study identified significant avoidance close to turbines and reported a predicted **52.5% reduction in Hen Harrier activity within 500 m of operating turbines**.

The assumption of complete displacement within 250 m is therefore an assessment methodology adopted by the Applicant; it is not itself the quantitative finding reported by Pearce-Higgins et al.

The CLG does not contend that a 500 m buffer should simply replace the 250 m buffer, nor that a 52.5% reduction in recorded activity can automatically be converted into an equivalent percentage loss of every hectare of habitat within 500 m.

The central question is:

Has the Applicant demonstrated that assumed complete displacement within 250 m provides an adequate and precautionary surrogate for the wider functional reduction in Hen Harrier activity identified within 500 m?

The Further Information does not transparently demonstrate this.

1. The spatial difference between 250 m and 500 m is substantial

The distinction between the two distances is particularly important because the area potentially affected increases with the **square of the radius**.

For a **single turbine**, a 250 m radius encompasses approximately:

$$\pi \times 250^2 = 196,350 \text{ m}^2, \text{ or } 19.63 \text{ ha}$$



A 500 m radius encompasses approximately:

$$\pi \times 500^2 = 785,398 \text{ m}^2, \text{ or } 78.54 \text{ ha}$$

The gross land area within 500 m of a single turbine is therefore **four times the gross land area within 250 m**.

This fourfold difference is important when considering the Pearce-Higgins findings.

For a single turbine, and **for illustration only**:

$$100\% \times 19.63 \text{ ha} = 19.63 \text{ ha}$$

whereas:

$$52.5\% \times 78.54 \text{ ha} = \text{approximately } 41.23 \text{ ha}$$

The latter represents approximately **2.1 times the area** represented by complete displacement within 250 m.

Illustrative single-turbine comparison	250 m	500 m
Radius	250 m	500 m
Gross area	19.63 ha	78.54 ha
Relative gross land area	1×	4×
Effect assumed/reported	100% assumed displacement	52.5% reported reduction in activity
Illustrative area × effect	19.63 ha	41.23 ha

Important qualification: This comparison is provided solely to demonstrate the mathematical significance of the different spatial scales. The CLG does not equate reduced Hen Harrier activity with direct hectare-for-hectare habitat loss and does not advance 41.23 ha per turbine as an alternative habitat-loss calculation.

Nor can these individual-turbine figures simply be multiplied by the number of turbines. At the larger spatial scale, influence zones around adjoining turbines overlap, and those overlaps must be removed when determining the combined geometric area. Furthermore, only part of the resulting area will comprise suitable or potentially suitable Hen Harrier habitat at any particular stage of the forestry cycle.



The significance of the calculation is therefore not that it produces a replacement habitat-loss figure. Rather, it demonstrates the **scale of the methodological difference** between examining complete displacement within 250 m and considering the substantially wider area over which the cited research identifies reduced Hen Harrier activity.

2. Is the 250 m assumption genuinely precautionary?

The assumption of 100% displacement within 250 m has been presented as a conservative or precautionary approach.

However, the use of 100% avoidance does not, by itself, demonstrate that the resulting assessment is more precautionary where the spatial extent over which that assumption is applied is substantially smaller than the area over which reduced activity has been identified.

The 250 m radius encompasses only **one quarter of the gross land area** within 500 m.

The illustrative calculation above therefore demonstrates why complete displacement within the smaller 250 m radius is not self-evidently a conservative representation of the wider functional effect.

This does **not** establish that the 250 m methodology is incorrect. It does, however, mean that the Applicant should demonstrate why the smaller complete-displacement surrogate remains precautionary **for this site**, having regard to the distribution of suitable habitat and the wider reduction in Hen Harrier activity identified in the scientific evidence upon which the Applicant itself relies.

A precautionary assessment should not exclude potentially material functional effects merely because they occur outside the radius selected for calculating complete displacement.

3. Effects between 250 m and 500 m require explicit consideration

The appropriate ecological question is not simply whether Hen Harrier are completely displaced from suitable habitat within 250 m of a turbine.

It is also necessary to determine what happens to suitable or potentially suitable habitat **between 250 m and 500 m**, where the cited evidence identifies reduced Hen Harrier activity.

The CLG considers that the assessment should:



1. identify the spatial extent over which turbine-related effects may reasonably occur;
2. identify the amount and distribution of suitable or potentially suitable Hen Harrier habitat within that area;
3. account for changes in habitat suitability through the forestry cycle;
4. assess the reasonable degree of functional reduction in use of that habitat, distinguishing complete displacement from partial reduction in use;
5. assess the combined and cumulative effect of Knockshanvo and Oatfield, with overlapping influence areas appropriately removed; and
6. only thereafter determine the habitat-loss and compensation requirement.

This sequencing is important. The existence of a compensation package cannot itself demonstrate that the package is adequate unless the **effect requiring compensation has first been adequately identified and quantified**.

The central question therefore remains:

What amount of suitable or potentially suitable Hen Harrier habitat occurs between 250 m and 500 m of the proposed turbines during the operational period; what reduction in functional use of that habitat is reasonably predicted; and where has that reduction been incorporated into the Applicant's habitat-loss, cumulative-effects and compensation calculations?

The Further Information does not clearly answer that question.

4. Cumulative Knockshanvo and Oatfield mapping

The spatial significance of this issue becomes considerably clearer when Knockshanvo is considered cumulatively with the adjoining Oatfield proposal.

A geometric mapping exercise has been undertaken using the proposed turbine coordinates for both developments. The purpose of this exercise is **not to calculate Hen Harrier habitat loss**, but to illustrate the spatial scale of the cumulative assessment issue.

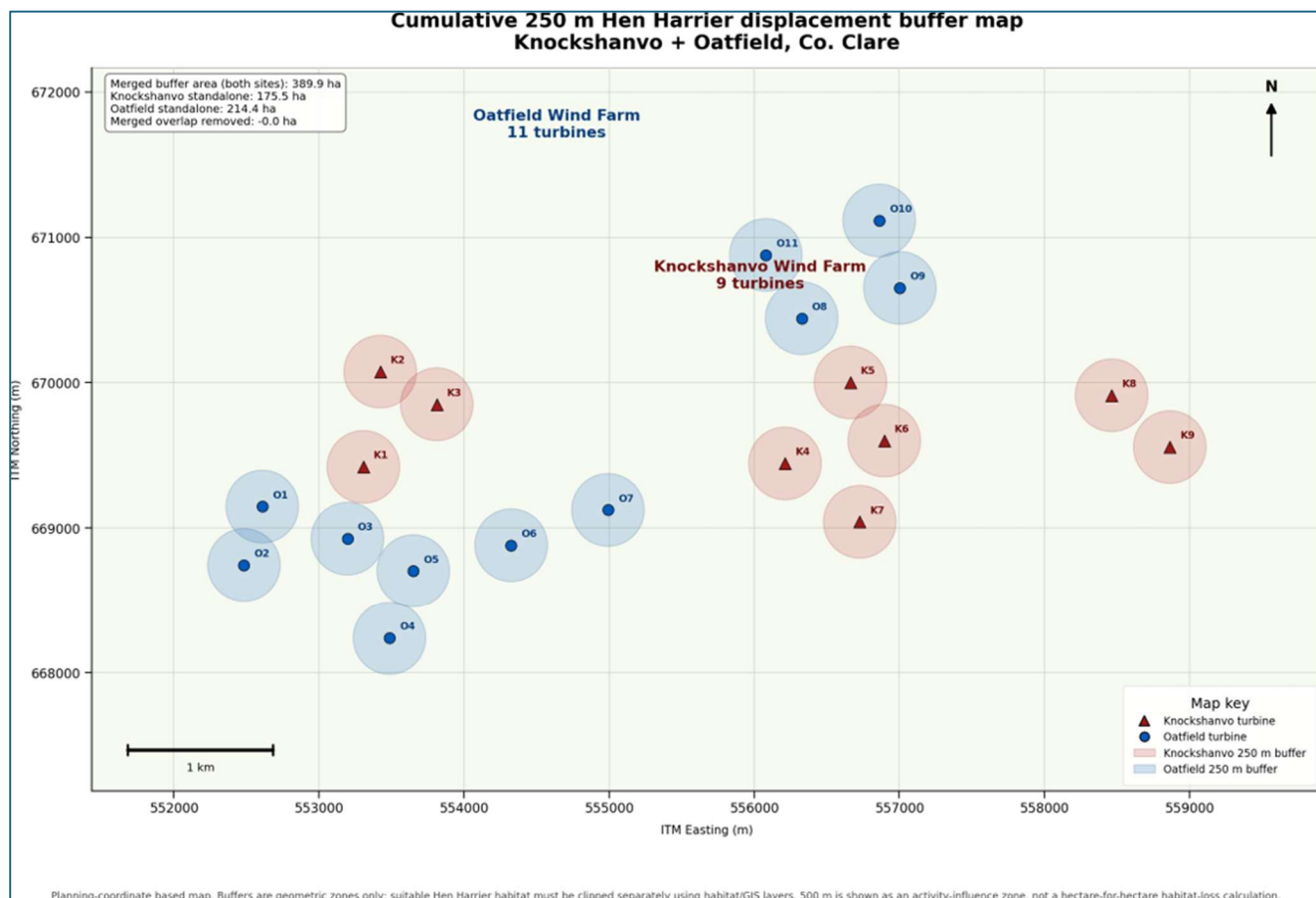


Figure 2: 250 m complete-displacement surrogate

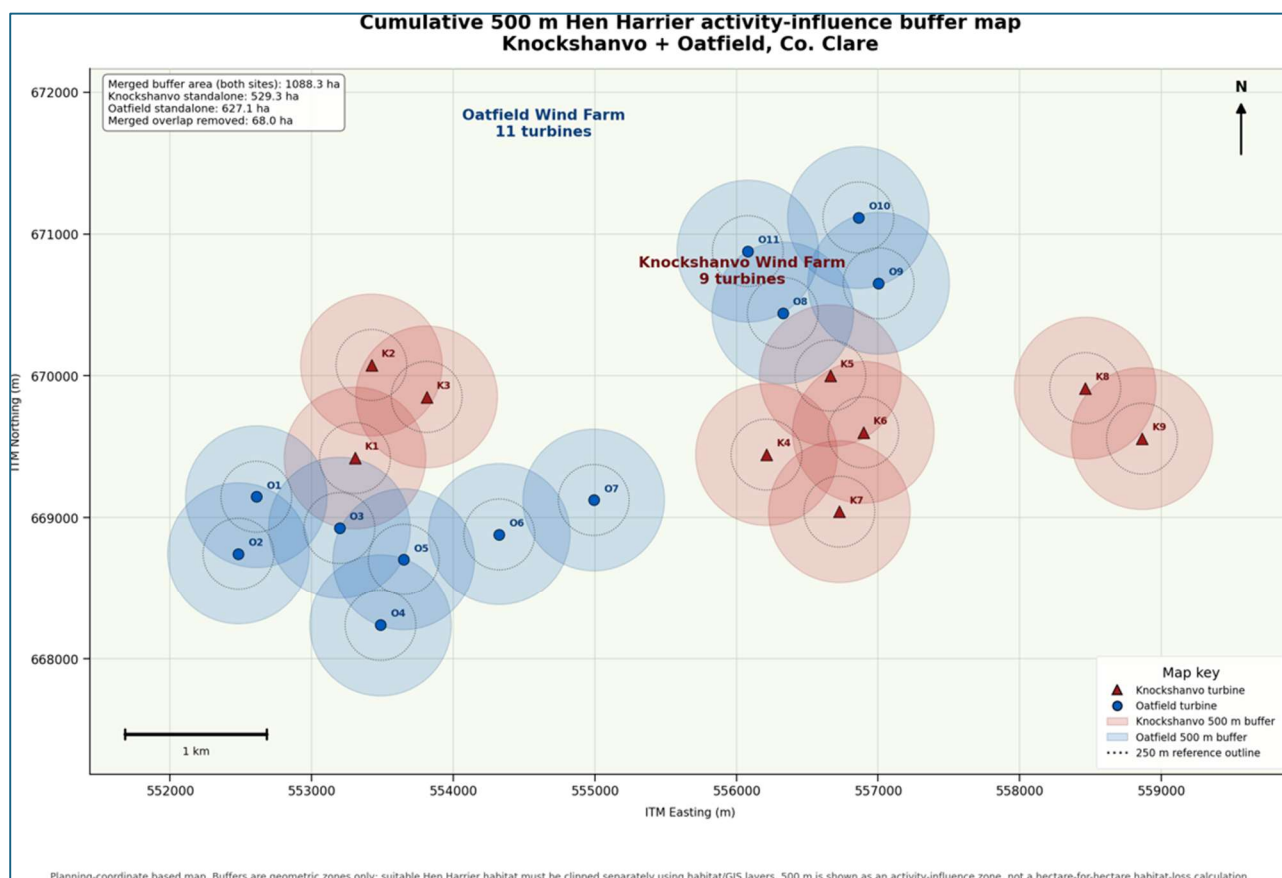


Figure 3: 500 m wider activity-influence zone

The results are:

Geometric buffer	Knockshanvo	Oatfield	Combined merged area
250 m	175.51 ha	214.40 ha	389.91 ha
500 m	529.27 ha	627.06 ha	1,088.32 ha

At the 500 m scale, approximately **68.01 ha of overlap between the Knockshanvo and Oatfield buffers has been removed** in arriving at the combined 1,088.32 ha figure.

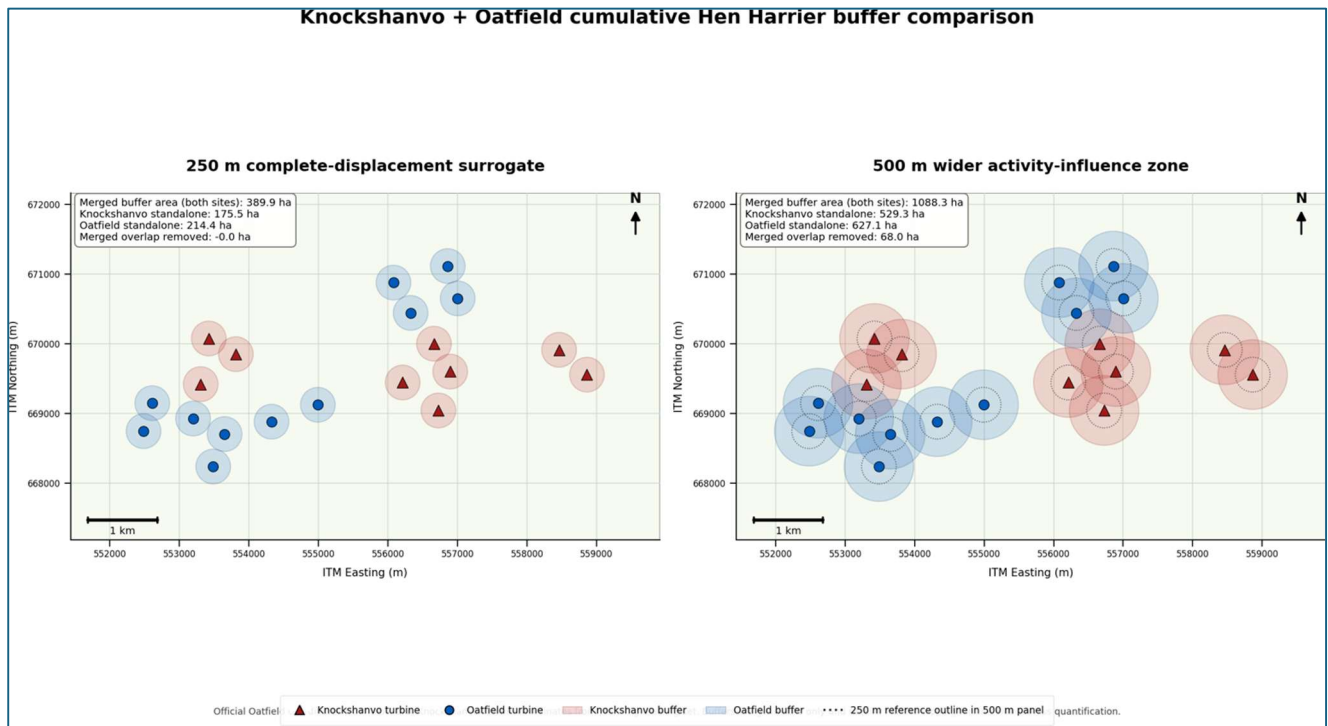


Figure 4: Cumulative 250 m / 500 m comparison

These figures are **geometric buffer areas only**. They are not suitable-habitat-clipped and must not be interpreted as Hen Harrier habitat-loss figures. Final quantification would require identification of suitable and potentially suitable habitat within these areas, forestry-cycle modelling, assessment of functional use and appropriate treatment of overlaps.

Nevertheless, the comparison is highly relevant. The combined geometric area increases from approximately **389.91 ha at 250 m to 1,088.32 ha at 500 m**, illustrating the substantially wider landscape potentially relevant once effects beyond the complete-displacement zones are considered.

5. Fragmentation, connectivity and barrier effects

The significance of this wider spatial area is not confined to hectare totals.

Hen Harrier use a landscape containing different but interconnected habitat functions, including **nesting, roosting and foraging areas**. The ecological value of those habitats therefore depends not simply upon their total area but upon their location, distribution and connectivity.

Wind-energy development may potentially result not only in direct or functional habitat loss but also in **avoidance, fragmentation, reduced connectivity and barrier effects**.



A turbine array may therefore reduce the functional value of habitat without rendering every hectare within a defined radius completely unavailable. Reduced use of particular areas, or the positioning of turbines between important habitat patches, may affect movement between nesting, roosting and foraging areas.

The cumulative mapping does not establish that fragmentation or a barrier effect will occur. It does, however, demonstrate why these effects require explicit assessment.

A methodology based principally upon complete displacement within individual 250 m turbine buffers does not, by itself, demonstrate that these wider functional effects have been captured.

6. Fragmentation and connectivity must also be assessed over time

There is an additional **temporal dimension** to this issue which is particularly important in a landscape containing extensive commercial forestry.

The Applicant itself recognises that the suitability of forestry for Hen Harrier changes materially through the forestry lifecycle. Felling may create new areas of suitable foraging habitat, while replanted forestry may subsequently become progressively less suitable as the canopy develops and closes.

The turbine locations and their associated displacement or reduced-use zones will, however, remain fixed throughout the operational life of the development.

The spatial relationship between the turbine array and suitable Hen Harrier habitat may therefore change substantially over time.

An arrangement which does not materially fragment suitable habitat during one period of the forestry cycle may have a materially different effect following subsequent felling, replanting or canopy closure. Newly available foraging habitat could, for example, become functionally separated from other important habitat by the spatial configuration of turbines and their associated displacement or reduced-use zones.

Similarly, Hen Harrier nesting and roosting locations are not necessarily static over the operational life of a wind farm. Assessment of connectivity should therefore not be confined to presently recorded nest or roost locations but should consider the relationship between the turbine layout and **known and potential nesting, roosting and foraging habitat** throughout the operational period.

This gives rise to an important question:



Has the Applicant mapped the proposed turbines, the 250 m complete-displacement zones, the wider 250–500 m reduced-activity zones and the interconnected nesting, roosting and foraging habitat in a manner capable of identifying potential fragmentation or barrier effects as the forestry landscape changes over time?

The Further Information does not appear to provide such a temporal-spatial assessment.

The CLG considers that the Applicant should therefore provide **annual or appropriate interval-based spatial mapping over the operational life of the development**, showing:

- suitable and potentially suitable nesting, roosting and foraging habitat;
- known nesting and roosting information where appropriate;
- the 250 m complete-displacement zones;
- the wider 250–500 m reduced-activity zones;
- forestry felling, replanting and canopy-development stages;
- compensation and enhancement lands; and
- the resulting functional connectivity between the principal areas of Hen Harrier habitat.

This assessment should be undertaken cumulatively for **Knockshanvo and Oatfield**, because the relevant ecological issue is the combined spatial configuration of the turbine arrays within the same wider Hen Harrier landscape.

Such mapping would allow the Commission to determine whether fragmentation, reduced connectivity or barrier effects may arise **at any material stage during the operational life of the developments**, rather than only under the habitat configuration existing at the time of the present assessment.

This is particularly important because the Applicant already relies upon forestry rotation in deriving the amount of habitat considered available for Hen Harrier.

If forestry rotation is sufficiently important to determine how much Hen Harrier habitat is available, it is equally relevant to determining where that habitat will occur, how it will connect with other functional habitat, and how its relationship with the fixed turbine array will change over time.



7. A merged Knockshanvo/Oatfield functional habitat assessment is required

Separate project-specific habitat-loss calculations do not necessarily demonstrate the combined functional effect of two adjoining turbine arrays affecting the same wider Hen Harrier landscape.

The Commission should therefore be provided with a **single transparent cumulative assessment for Knockshanvo and Oatfield**, before compensation and enhancement measures are applied.

That assessment should identify:

- the combined 250 m complete-displacement zones;
- the combined 250–500 m reduced-use zones;
- overlapping influence areas and their removal from gross calculations;
- suitable and potentially suitable Hen Harrier habitat within those areas;
- known and potential nesting, roosting and foraging habitat;
- variation in habitat suitability through the forestry lifecycle;
- complete and partial functional displacement;
- changes in habitat connectivity through time;
- fragmentation and potential barrier effects;
- the resulting cumulative functional habitat loss before mitigation;
- the location and function of compensation and enhancement lands; and
- the resulting cumulative residual effect.

Only once the underlying cumulative functional effect has been established on a consistent spatial and temporal basis can the Commission determine whether the proposed compensation and enhancement measures are proportionate to that effect.

8. Operational average versus actual habitat availability

A separate but closely related uncertainty concerns the Applicant's use of the commercial forestry cycle in calculating habitat loss.

The Applicant explains that Coillte felling plans were used:

“to determine the average amount of potentially available hen harrier habitat over the operational phase of the wind farm.”

This demonstrates that forestry rotation has been considered in deriving the 58.57 ha figure.



It does **not**, however, resolve whether the resulting figure represents an operational-life average rather than the **maximum simultaneous functional habitat loss** occurring during particular stages of the forestry cycle.

That distinction is ecologically important.

Hen Harrier experience habitat availability **seasonally and annually**, as forestry is felled, replanted and progresses towards canopy closure. They do not experience habitat availability as a mathematical average calculated across the operational life of a wind farm.

There may consequently be periods during the operational phase when materially more suitable habitat exists within the relevant turbine influence zones than is represented by the long-term average.

Furthermore, the issue is not merely **how much** suitable habitat exists at any particular time, but **where that habitat occurs and whether it remains functionally connected**.

The Commission should therefore require the Applicant to provide the **parcel-by-parcel and annual or appropriate interval-based calculation underpinning the 58.57 ha figure**, together with corresponding spatial mapping, including:

- relevant felling assumptions;
- replanting assumptions;
- periods during which forestry is considered suitable before canopy closure;
- calculated annual or interval habitat availability and loss;
- the operational average;
- the **maximum simultaneous functional habitat loss**; and
- the spatial distribution and connectivity of the resulting suitable habitat.

Without this information, the Commission cannot determine whether compensation dimensioned against the 58.57 ha average remains adequate during periods when the actual functional habitat effect may be greatest.

9. Implications for the compensation package

The Applicant identifies **58.57 ha of predicted habitat loss**, proposes approximately **54.2 ha of permanent deforestation/restored peatland**, and additionally relies upon approximately **46.5 ha of farmland enhancement or safeguarding**.

The CLG acknowledges that substantive compensation and enhancement measures have therefore been proposed.



The unresolved issue is whether those measures have been dimensioned against the **correct underlying habitat-loss metric**.

If the 58.57 ha figure:

- represents an operational average rather than maximum simultaneous loss;
- principally captures complete displacement within 250 m;
- does not adequately account for functional reduction between 250 m and 500 m;
- does not account for changing fragmentation and connectivity through the forestry lifecycle;
- does not adequately assess potential barrier effects; or
- has not been derived from a merged Knockshanvo/Oatfield cumulative assessment,

then the proposed compensation may be proportionate only to an **incomplete measure of the underlying effect**.

This is particularly important because the Applicant states that:

“the successful implementation of the proposed comprehensive compensation and enhancement plan ensures the proposed Wind Farm Site avoids any future contribution to a significant cumulative effect”

on Hen Harrier.

That conclusion depends fundamentally upon the loss against which the compensation is measured having first been correctly identified.

10. *Information required before the residual conclusion can be accepted*

Before accepting the Applicant's conclusion regarding residual and cumulative effects upon Hen Harrier, the CLG submits that the Commission should require the Applicant to:

1. **provide the annual or appropriate interval-based forestry calculation underpinning the 58.57 ha figure**, identifying both operational-average and maximum simultaneous functional habitat loss;
2. **explain how reduced Hen Harrier use between 250 m and 500 m has been assessed**, or provide a clear ecological justification for excluding that reduced-use zone from the functional habitat-loss calculation;



3. **demonstrate why complete displacement within 250 m constitutes an adequately precautionary surrogate** for the wider functional effect identified in the cited scientific evidence;
4. **provide a merged, habitat-clipped Knockshanvo/Oatfield cumulative assessment supported by annual or appropriate interval-based mapping over the operational life**, showing how changes in forestry habitat interact with the fixed turbine influence zones and with known and potential nesting, roosting and foraging habitat;
5. **assess fragmentation, habitat connectivity and potential barrier effects through time**, rather than solely by reference to the present habitat configuration; and
6. **demonstrate that the proposed compensation and enhancement package remains functionally connected and proportionate to the verified cumulative functional habitat loss throughout the operational period**, rather than merely to the 58.57 ha operational-average figure.

11. *CLG Conclusion*

The CLG does not contend that Pearce-Higgins et al. requires 52.5% of every hectare within 500 m of a turbine to be classified as lost Hen Harrier habitat. Nor does the CLG contend that the **1,088.32 ha combined geometric 500 m buffer area** represents Hen Harrier habitat loss. It is a spatial illustration only; habitat suitability, forestry lifecycle and ecological function would require assessment before any habitat-loss figure could properly be derived.

The concern is that the Applicant has moved from scientific evidence identifying significant Hen Harrier avoidance to at least 250 m and a modelled **52.5% reduction in flight activity within 500 m**, to an assessment methodology based upon assumed **100% displacement within 250 m**, without transparently demonstrating that this surrogate adequately and conservatively represents the wider functional effect.

The spatial consequence is material. A 500 m radius encompasses **four times the gross area** of a 250 m radius. For illustration only, applying the reported 52.5% activity reduction across the wider gross area produces an area approximately **2.1 times** that represented by complete displacement within 250 m. This is not advanced as an alternative habitat-loss calculation. It demonstrates why the 250 m complete-displacement surrogate requires ecological justification before being characterised as precautionary.

A further uncertainty now arises concerning the **transferability of the underlying scientific evidence to the scale of turbines proposed at Knockshanvo**. Pearce-



Higgins et al. examined turbines with hub heights of **30–70 m**, with a turbine-number-weighted average of approximately **49 m**. The proposed Knockshanvo turbines have hub heights of **102.5–110.5 m**. Every Knockshanvo turbine therefore lies outside the hub-height range represented in that study and is approximately **2.1–2.3 times its weighted-average hub height**.

The CLG does not contend that Hen Harrier displacement distance increases proportionally with turbine height, and no alternative displacement radius is advanced on that basis. The issue is one of **scientific transferability and uncertainty**. Where an empirical displacement relationship derived from substantially smaller turbines is being relied upon to determine the spatial extent of functional habitat loss, and ultimately the compensation requirement, the Applicant should demonstrate why that relationship can reliably and precautionarily be transferred without adjustment to turbines whose hub heights lie wholly outside the study range. The Applicant has not demonstrated that turbine dimensions are immaterial to that transferability.

The cumulative spatial analysis reinforces the importance of these questions. The combined Knockshanvo/Oatfield geometric buffer area increases from approximately **389.91 ha at 250 m to 1,088.32 ha at 500 m**, illustrating the substantially wider landscape potentially relevant to reduced use, fragmentation, connectivity and potential barrier effects.

There is also an important temporal dimension. The commercial forestry landscape will change throughout the operational period while the turbine arrays remain fixed. The amount, location and connectivity of suitable Hen Harrier habitat may therefore vary materially through felling, replanting and canopy closure. An absence of fragmentation under one habitat configuration does not establish that fragmentation or barrier effects will not arise under materially different future configurations. If forestry rotation is relied upon to determine how much habitat is available, it should also be considered in determining **where that habitat occurs and whether it remains functionally connected**.

Taken together, the Applicant's use of an operational-life average, the treatment of the **250–500 m reduced-activity zone**, the transferability of evidence derived from substantially smaller turbines, the changing spatial distribution of habitat through the forestry lifecycle, and the absence of a transparent merged Knockshanvo/Oatfield functional habitat assessment leave **material uncertainty regarding the full spatial, temporal and cumulative functional effects upon Hen Harrier habitat**.

Accordingly, before relying upon the Applicant's **58.57 ha habitat-loss figure** and the compensation package dimensioned against it, the Commission should be satisfied that the underlying habitat effect has first been robustly and conservatively quantified. This



should include appropriate consideration of displacement and reduced habitat use, turbine-scale transferability, changing habitat availability through the forestry lifecycle, fragmentation, connectivity and potential barrier effects, both for Knockshanvo individually and cumulatively with Oatfield and other relevant development.

On the information presently provided, the CLG submits that this has not been demonstrated with sufficient certainty.

I prefer this version because the conclusion now brings together **four distinct weaknesses** in the 58.57 ha calculation: the **250 m versus 500 m spatial issue**, the **much larger modern turbine scale**, the **forestry-cycle/operational-average issue**, and the **cumulative fragmentation/connectivity issue**.

Most importantly, it doesn't claim we know what the “correct” habitat-loss figure is. It puts the burden back on the Applicant's evidence: **before 58.57 ha can be relied upon to dimension compensation, ACP needs to be satisfied that the methodology producing 58.57 ha is sufficiently robust.**

Applicability of the Pearce-Higgins Evidence to Modern Turbine Scale

A further uncertainty concerns the applicability of the Pearce-Higgins et al. (2009) evidence to turbines of the scale now proposed at Knockshanvo.

The Pearce-Higgins study examined 12 upland wind farms comprising **300 turbines**. The turbines had hub heights ranging from **30 m to 70 m**, with a turbine-number-weighted average hub height of approximately **49 m**.

By comparison, the proposed Knockshanvo turbines have hub heights of approximately **102.5–110.5 m**. Every proposed Knockshanvo turbine therefore exceeds the maximum hub height represented in the Pearce-Higgins dataset, while the proposed hub heights are approximately **2.1–2.3 times the weighted average hub height** of the turbines studied.

This does not establish that Hen Harrier displacement distance necessarily increases in direct proportion to turbine height. The CLG does not advance such an assumption, and Pearce-Higgins does not provide a basis for deriving a new displacement radius by simple proportional scaling.

However, the substantial difference in turbine scale raises an important question of **transferability**. The Applicant relies upon an empirical relationship derived from



substantially smaller turbines when determining the spatial extent of Hen Harrier displacement and, ultimately, the quantity of habitat requiring compensation.

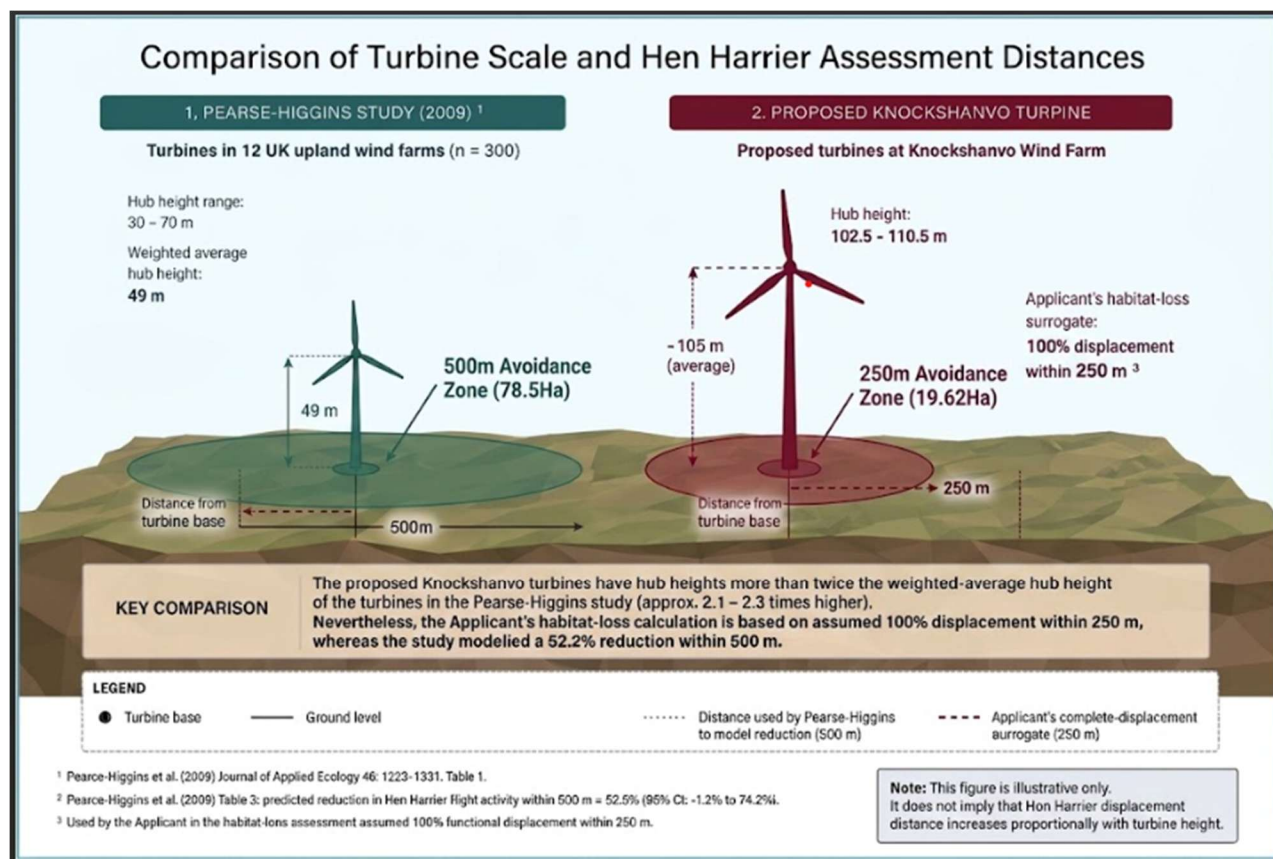


Figure 5: Comparison of turbine scale and Hen Harrier assessment distances. Pearce-Higgins et al. (2009) studied turbines with hub heights of 30–70 m (weighted average approximately 49 m), whereas the proposed Knockshanvo turbines have hub heights of 102.5–110.5 m. The figure also illustrates the distinction between the significant avoidance identified by Pearce-Higgins to at least 250 m, the modelled 52.5% reduction in Hen Harrier flight activity within 500 m, and the Applicant's use of assumed 100% displacement within 250 m for habitat-loss assessment. The figure is illustrative only and does not imply that Hen Harrier displacement distance increases proportionally with turbine height.

The Pearce-Higgins paper does not appear to test turbine hub height as a determinant of Hen Harrier avoidance, nor does it demonstrate that the displacement relationship identified is independent of turbine scale. The study therefore does not, by itself, establish that a displacement surrogate derived from turbines with hub heights of 30–70 m can be applied without adjustment to turbines with hub heights exceeding 100 m.

The distinction is particularly relevant because the proposed Knockshanvo turbines lie **wholly outside the turbine-height range represented in the principal study relied upon.**

There is also a habitat-context difference. Pearce-Higgins examined unenclosed upland habitats including moorland, rough grassland and blanket bog, while forest and felled



forest were excluded from its core survey areas. By contrast, the Knockshanvo assessment depends materially upon the changing suitability of commercial forestry through the forestry lifecycle.

Accordingly, the Commission should require the Applicant to explain the scientific basis upon which the Pearce-Higgins displacement relationship is considered transferable to the substantially larger turbines and different habitat context proposed at Knockshanvo.

In particular, the Applicant should identify whether there is evidence demonstrating that Hen Harrier displacement response is unaffected by turbine dimensions, or otherwise explain how uncertainty arising from the substantial difference in turbine scale has been incorporated into the habitat-loss and compensation assessment.

In the absence of such justification, the use of a 250 m complete-displacement surrogate derived from an evidence base involving substantially smaller turbines introduces an additional uncertainty into the Applicant's 58.57 ha habitat-loss calculation.

CLG Conclusion

The Further Information does not satisfactorily resolve Clare County Council's concern regarding cumulative effects on Hen Harrier.

The updated evidence confirms that Knockshanvo would form part of a substantial concentration of wind energy development within the East Clare uplands. Of particular importance is the adjoining Oatfield proposal, comprising a further 11 turbines, with the nearest turbines approximately 500 m from Knockshanvo, while Fahybeg and Lackareagh have progressed to permitted status. These circumstances increase the importance of a robust **landscape-scale cumulative assessment**.

A material uncertainty remains regarding the Applicant's quantification of Hen Harrier habitat loss. The Applicant's **58.57 ha** figure relies upon assumed **100% displacement within 250 m** of turbines and an average amount of potentially available habitat over the forestry rotation. However, the scientific evidence relied upon by the Applicant identifies significant Hen Harrier avoidance to at least 250 m and a modelled **52.5% reduction in flight activity within 500 m**. The Further Information does not transparently demonstrate that the 250 m complete-displacement surrogate adequately and conservatively represents this wider functional effect.



There is now a further question regarding the **transferability of the underlying scientific evidence to turbines of the scale proposed at Knockshanvo**. Pearce-Higgins et al. (2009) examined turbines with hub heights ranging from **30–70 m**, with a turbine-number-weighted average of approximately **49 m**. The proposed Knockshanvo turbines have hub heights of **102.5–110.5 m**, meaning that every proposed turbine lies outside the hub-height range represented in that study. The CLG does not contend that displacement distance necessarily increases proportionally with turbine height. Rather, the Applicant has not demonstrated why an empirical displacement relationship derived from substantially smaller turbines can be transferred without adjustment or additional uncertainty to turbines whose hub heights are more than twice the study's weighted average.

The significance of the wider spatial issue is illustrated by the cumulative mapping. The combined Knockshanvo/Oatfield geometric turbine-buffer area increases from approximately **389.91 ha within 250 m to 1,088.32 ha within 500 m**. The CLG does not suggest that these geometric areas constitute Hen Harrier habitat loss. They demonstrate the substantially greater landscape area requiring ecological examination once the wider reduced-activity zone identified in the scientific evidence is considered.

The assessment must also address **how habitat functions spatially and changes through time**. Commercial forestry creates a dynamic habitat landscape in which the amount, location and connectivity of suitable Hen Harrier habitat change through felling, replanting and canopy closure, while the turbine arrays remain fixed. The Applicant has not provided a transparent temporal-spatial assessment demonstrating how known and potential nesting, roosting and foraging habitat will remain functionally connected throughout the operational period, or whether changing forestry conditions could give rise to periods of increased displacement, fragmentation, reduced connectivity or barrier effects.

These matters are directly relevant to the Applicant's reliance upon compensation and enhancement. The issue is not simply whether compensation has been proposed, but whether the **full functional effect requiring compensation has first been adequately identified and quantified**. An operational-life average based principally upon complete displacement within 250 m cannot, without further justification, demonstrate that the compensation package remains adequate during periods of greater habitat availability or materially different spatial configurations of suitable habitat. The separate issues concerning the ecological effectiveness, timing, security and additionality of the proposed compensation measures are addressed under **Response 23 – Hen Harrier Compensation and Enhancement Lands**.



The Commission should therefore require a **merged Knockshanvo/Oatfield functional habitat assessment**, undertaken before reliance is placed upon the proposed compensation package. This should identify suitable and potentially suitable habitat within the relevant turbine influence zones, remove spatial overlap, address reduced habitat use beyond 250 m, and examine displacement, fragmentation, connectivity and potential barrier effects through appropriate stages of the forestry lifecycle. It should also address the uncertainty associated with applying displacement evidence derived from substantially smaller turbines to the proposed Knockshanvo turbine dimensions. Both the operational-average and **maximum simultaneous functional habitat effect** should be identified.

Accordingly, the CLG submits that the Applicant has **not demonstrated with sufficient certainty that the 58.57 ha figure represents the full spatial, temporal and cumulative functional effect upon Hen Harrier habitat, or that the compensation and enhancement package has therefore been dimensioned against an adequately established underlying habitat effect**. In the absence of a transparent landscape-scale and temporal assessment of Knockshanvo together with Oatfield and the other relevant developments, and adequate justification for the displacement methodology upon which the habitat-loss calculation depends, the Applicant's conclusion that Knockshanvo will avoid contributing to a significant cumulative effect upon Hen Harrier has not been adequately demonstrated.

Given the conservation status of Hen Harrier and the concentration and advancing status of wind energy development within the East Clare uplands, these uncertainties remain critical and unresolved matters for the Commission in determining the application.

One correction I've deliberately made is changing the old “RR-23” reference to “**Response 23 – Hen Harrier Compensation and Enhancement Lands**”, consistent with the cross-reference clean-up we identified earlier.



Response 31 – Clare County Council: Aviation

Applicant's Response

Clare County Council identifies the proximity of the proposed development to Shannon Airport and the Woodcock Hill radar facility and requests that the Commission take account of the observations of **AirNav Ireland and Shannon Airport Authority** in determining the application.

The Applicant responds principally by referring to its detailed responses to AirNav Ireland and Shannon Airport and to the additional specialist aviation material submitted as Further Information.

The Applicant maintains that the identified aviation effects are capable of being addressed through technical mitigation, future procedure changes and continued engagement with the relevant aviation bodies.

CLG Assessment

Clare County Council's observation is important because it specifically directs the Commission to the views of the bodies responsible for the affected aviation environment.

The Applicant's Further Information does not demonstrate that the substantive concerns raised by AirNav Ireland and Shannon Airport have been withdrawn or resolved.

Rather, the Further Information confirms continuing interaction with:

- Instrument Flight Procedures and the ATCSMAC;
- Woodcock Hill MSSR;
- Shannon Primary Surveillance Radar; and
- associated aviation safeguarding requirements.

The Applicant identifies potential technical and procedural means by which these matters might ultimately be addressed. However, several remain dependent upon future



procedure redesign, PBN implementation, radar modification or supplementary infrastructure, regulatory approval and agreement with independent aviation bodies.

Of particular significance, AirNav has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”

AirNav has also stated that turbine shadowing would introduce coverage gaps in controlled airspace and degrade probability of detection. The Applicant has not demonstrated that AirNav has withdrawn or materially revised these positions.

The CLG therefore considers that Clare County Council's concern cannot be regarded as answered simply because additional specialist reports and possible mitigation options have been submitted.

The relevant question is whether those additional materials demonstrate an **accepted and deliverable solution** to the aviation effects identified by the responsible aviation bodies.

At present, they do not.

The cumulative relationship with the adjoining Oatfield proposal is also important. Knockshanvo and Oatfield would together introduce approximately 20 turbines within the same wider aviation safeguarding and radar environment. Any aviation solution relied upon by the Commission must therefore be capable of addressing the realistic cumulative development scenario.

Specialist Aviation Response

The matters identified by Clare County Council are examined in detail in Section 4 – **Specialist Aviation Response**, including:

- **Instrument Flight Procedures and ATCSMAC;**
- **Navaid Flight Calibration;**
- **Woodcock Hill MSSR;**
- **Shannon Primary Surveillance Radar;**
- **Proposed Radar Mitigation; and**
- **Proposed Planning Conditions and Deliverability.**

That specialist analysis should be read as an integral part of this response.



CLG Conclusion

Clare County Council specifically requested that the Commission take account of the observations of AirNav Ireland and Shannon Airport Authority.

The Applicant has provided substantial additional aviation material, but it has not demonstrated that the concerns of those bodies have been resolved.

The CLG therefore submits that Clare County Council's aviation concern remains material. Before permission could be granted, the Commission should be satisfied that the identified aviation effects have an operationally acceptable, regulatorily approvable and practically deliverable solution accepted by the relevant aviation bodies.

On the evidence presently before the Commission, that has not been demonstrated.

The detailed basis for this conclusion is set out in Section 4 – **Specialist Aviation Response**.

Response 32 – Private Wells and Drinking-Water Supplies

Applicant's Response

Further Information Document FI-2, Appendix 2 – HES Response, *Private Wells and Drinking-Water Supplies*, internal appendix pages.

The Applicant, through **Hydro-Environmental Services (HES)**, responds to concerns regarding the potential effects of the proposed development upon private groundwater wells and drinking-water supplies.

The Applicant maintains that the hydrological and hydrogeological assessment has adequately identified the relevant source–pathway–receptor relationships and that



there is no significant pathway by which construction or operation of the proposed development would adversely affect private wells or group water supplies.

The Applicant's underlying EIAR assessment states that there are “**no local groundwater well supplies in the vicinity of the Wind Farm Site**” and that local dwellings are located significant distances from proposed development infrastructure. It further maintains that, regardless of whether private wells are located downslope of the site, the potential for impact is negligible because:

- the site is underlain by an aquifer of low permeability;
- groundwater flow paths are typically short, stated to be approximately **300 m maximum**;
- the majority of groundwater flow emerges as springs or baseflow to streams and leaves the site principally as surface-water flow;
- substantial separation distances therefore mean that groundwater pathways between development infrastructure and potential private-well receptors are unlikely to exist; and
- construction-phase controls are proposed to address potential contamination from oils, fuels and other construction activities.

On that basis, the Applicant concludes that potential effects on local groundwater abstractions will be **negative, imperceptible, indirect, long-term and unlikely**, and that no significant effects on existing groundwater supplies will occur.

Issue

Whether the Applicant has demonstrated with sufficient site-specific evidence that private wells and drinking-water supplies potentially serving residences surrounding the Knockshanvo uplands have been adequately identified and protected, particularly where the conclusion of negligible risk relies substantially upon assumed short groundwater flow paths and separation distances rather than a comprehensive identification and hydrogeological assessment of individual drinking-water sources.

CLG Assessment

The protection of drinking-water supplies is a particularly important consideration because any adverse effect upon a domestic well can have an immediate consequence for the residents dependent upon that supply.



The CLG accepts that the Applicant has undertaken a substantial hydrological and hydrogeological assessment and has applied a conventional **source–pathway–receptor** methodology.

The issue is whether the evidence supporting the Applicant's conclusion is sufficiently site-specific and complete.

The HSE expressly requested identification of drinking-water sources

The Environmental Health Service's scoping response is directly relevant.

It stated that:

“All drinking water sources, both surface and ground water, must be identified.”

It specifically required identification of public and group water scheme sources and supplies **in addition to private wells supplying potable water to houses in the vicinity of the proposed development.**

Importantly, the Environmental Health Service recommended that a **walkover survey be undertaken in addition to desktop analysis of Geological Survey Ireland data in order to identify private wells used for drinking-water purposes.**

It further advised that the assessment should consider bedrock, overburden, groundwater vulnerability, groundwater flows, aquifers and catchment areas when assessing potential effects and mitigation.

This establishes an important benchmark against which the Applicant's response should be considered.

The relevant question is not simply whether known wells occur within an arbitrary distance of turbine infrastructure. It is whether the drinking-water receptors potentially affected by the development have actually been identified sufficiently to permit a reliable source–pathway–receptor assessment.

Absence of identified wells is not necessarily evidence of absence

The Applicant states that there are **“no local groundwater well supplies in the vicinity of the Wind Farm Site.”**

That conclusion requires scrutiny.



Private domestic wells are not necessarily comprehensively recorded within national groundwater databases. Consequently, a desktop search which does not identify registered wells cannot, by itself, demonstrate that no private groundwater abstractions exist.

This is precisely why the Environmental Health Service recommended a walkover survey specifically to identify private wells used for drinking-water purposes.

The Applicant's further statement that the potential impact would remain negligible **“regardless if private wells are located downslope of the Wind Farm Site or not”** does not remove the importance of identifying those receptors.

A source–pathway–receptor assessment is most reliable where the receptor is actually known.

If the location, abstraction depth, construction and hydrogeological setting of individual wells have not been established, the Applicant necessarily relies upon generalised assumptions regarding groundwater pathways and separation distances.

The asserted 300 m groundwater flow path is critical to the conclusion

A central component of the Applicant's case is that groundwater flow paths within the underlying low-permeability aquifer are typically very short, stated to be approximately **300 m maximum**.

That proposition materially underpins the conclusion that development infrastructure is too distant from potential wells for a significant pathway to exist.

The Commission should therefore be satisfied that this assumed maximum flow-path distance is sufficiently robust for the particular geological and hydrogeological conditions of the site.

Groundwater movement in fractured bedrock is not necessarily uniform. Localised fractures, faults, preferential pathways and connections between shallow groundwater, springs and surface-water systems can influence groundwater movement.

The Applicant itself recognises that much of the site's groundwater emerges as springs and baseflow to streams.

This reinforces the importance of considering the entire hydrological system rather than viewing groundwater and surface water as wholly separate receptors.



Where a drinking-water supply is influenced directly or indirectly by springs, shallow groundwater or surface-water catchments draining the uplands, protection of the supply may depend upon more than the horizontal distance between a turbine foundation and a recorded borehole.

Groundwater vulnerability remains relevant

The wider planning record demonstrates the importance of groundwater vulnerability within these uplands.

The CLG has previously identified areas of **high or extreme groundwater vulnerability** associated with the wider Knockshanvo/Oatfield landscape and has highlighted the dependence of surrounding rural residences upon private wells.

Groundwater vulnerability does not, by itself, establish that contamination will occur.

However, it describes the susceptibility of groundwater to contamination from activities at or near the surface and is therefore directly relevant when assessing construction involving excavation, turbine foundations, access roads, drainage works and the handling of fuels and other potentially contaminating substances.

The Applicant's reliance upon the low productivity or low permeability of the underlying aquifer should therefore not be treated as equivalent to low groundwater vulnerability.

These are different hydrogeological characteristics.

An aquifer may have limited regional productivity while shallow groundwater or fractured pathways remain vulnerable to localised disturbance or contamination.

Construction creates both quality and quantity pathways

The Applicant's assessment focuses substantially upon potential contamination of groundwater.

However, drinking-water security involves both **water quality and water quantity**.

Construction activities can potentially alter shallow drainage and groundwater behaviour through:

- excavation of turbine foundations;
- construction of access roads and drainage;



- dewatering;
- interception of shallow groundwater;
- excavation through peat and mineral soils; and
- creation or alteration of preferential drainage pathways.

The Applicant proposes mitigation to control construction contaminants, and these measures are appropriate.

However, measures designed to prevent fuel or sediment pollution do not necessarily address changes in groundwater flow or recharge which could affect the yield of a private well or spring.

The Commission should therefore be satisfied that the assessment addresses both aspects of drinking-water security.

Monitoring is not a substitute for establishing the baseline

The Applicant also relies upon monitoring as part of its overall water-protection strategy.

Monitoring is important and should form part of any construction environmental management regime.

However, monitoring can only reliably detect an adverse change to a private water supply where the supply has first been identified and an adequate **pre-construction baseline** has been established.

If individual wells or drinking-water sources surrounding the site have not been comprehensively identified and baseline-tested before construction, it may subsequently be difficult to determine whether any deterioration in water quality or quantity is attributable to the development.

This is particularly important for private household supplies because residents may have no alternative public mains supply readily available.

Accordingly, monitoring should complement rather than substitute for receptor identification and baseline characterisation.

The Ballycar evidence does not determine the Knockshanvo issue

The wider planning record includes the Ballycar Inspector's Report, where the National Environmental Health Service concluded on the evidence in that particular application



that protection of private wells had been adequately considered and that there was no hydrological connection to two identified group water schemes.

That demonstrates that drinking-water concerns can be satisfactorily resolved where the relevant receptors and hydrological relationships are adequately established.

However, the conclusion reached for Ballycar cannot simply be transferred to Knockshanvo.

The relevant issue here is whether **the Knockshanvo evidence itself** demonstrates the absence of significant pathways to the private and group water supplies potentially serving the surrounding community.

CLG Conclusion

The Further Information does not provide sufficient certainty to remove the concerns regarding private wells and drinking-water supplies.

The Applicant relies principally upon a source–pathway–receptor assessment, substantial separation distances and its conclusion that groundwater flow paths within the low-permeability aquifer are generally short, stated to be approximately **300 m maximum**. On that basis it concludes that significant effects upon local groundwater supplies will not occur.

However, the Environmental Health Service expressly required that **all drinking-water sources be identified** and recommended a walkover survey, in addition to desktop analysis, specifically to identify private wells used for potable supply.

The Applicant's statement that no local groundwater wells occur in the vicinity, coupled with its further assertion that effects would be negligible regardless of whether private wells are located downslope, does not demonstrate that all potentially relevant private drinking-water receptors have been individually identified and hydrogeologically characterised.

This is material because the Applicant's conclusion depends upon assumptions regarding groundwater flow paths and separation distances. Without identification of the individual receptors, their abstraction characteristics and their relationship to shallow groundwater, springs and surface-water catchments, the source–pathway–receptor assessment necessarily retains uncertainty.



The Commission should therefore require sufficient certainty that **all private wells and other drinking-water sources potentially affected by the development have been identified and appropriately baseline-tested before any construction activity occurs**, with enforceable arrangements for monitoring both water quality and quantity and for immediate investigation and remediation should an adverse change arise.

Given the dependence of rural households upon secure drinking-water supplies and the potentially serious consequences of contamination or loss of supply, the CLG submits that this matter should be resolved on the basis of **site-specific receptor evidence rather than generalised assumptions concerning groundwater flow distances**. The protection of private wells and drinking-water supplies therefore remains a **critical consideration in determining the application**.

Response 33 – Gortacullin Bog NHA: Hydrological Effects

Applicant's Response

Further Information Document FI-2, Appendix 2 – HES Response, *Gortacullin Bog Hydrology*, internal appendix pages.

The Applicant, through **Hydro-Environmental Services (HES)**, responds to concerns regarding the potential for the proposed Knockshanvo Wind Farm to alter the hydrology of **Gortacullin Bog Natural Heritage Area (NHA) [002401]**.

This is a material issue because Gortacullin Bog NHA directly adjoins the northern part of the proposed development site and is a nationally designated peatland of conservation importance. The EIAR identifies the NHA as containing a mosaic of upland blanket bog and wet heath and describes it as a site of national importance for peatlands. The NHA boundary is approximately **50 m from the nearest proposed infrastructure**, comprising an access road.

HES rejects the contention that the proposed development will cause a damaging hydrological effect upon the NHA. The Applicant relies upon its catchment mapping, topography and drainage-direction assessment, the separation between proposed



infrastructure and the NHA, the existing forestry drainage environment and the proposed drainage and water-management measures.

The Applicant's position is that the source–pathway–receptor assessment does not identify a hydrological pathway capable of causing a significant adverse effect upon Gortacullin Bog NHA and that the proposed drainage arrangements will maintain existing hydrological patterns and prevent development-related drainage from adversely affecting the designated peatland.

The Applicant therefore maintains that the proposed development will not result in a significant alteration to the hydrological regime of Gortacullin Bog NHA.

Issue

Whether the Applicant has demonstrated with sufficient site-specific hydrological and hydrogeological evidence that the proposed development, including access-road construction, drainage works, forestry felling and associated land disturbance close to the boundary of Gortacullin Bog NHA, will not alter the hydrological regime upon which this nationally protected peatland depends.

CLG Assessment

Gortacullin Bog NHA requires particular consideration because the conservation value of a blanket-bog system is intrinsically dependent upon its hydrological regime.

The relevant issue is therefore not confined to direct physical intrusion into the designated boundary.

Development outside an NHA can affect a peatland where excavation, drainage, forestry operations or changes in groundwater or surface-water movement alter the hydrological conditions necessary to maintain the protected habitat.

This distinction is particularly important at Gortacullin Bog because the Applicant's own EIAR confirms that the NHA **borders the proposed development site** and that proposed infrastructure comes to approximately **50 m of its boundary**.



The Applicant's own EIAR recognises Gortacullin Bog as being within the likely Zone of Influence

The EIAR does not screen Gortacullin Bog out as an ecologically remote receptor.

On the contrary, Chapter 6 expressly identifies the NHA as being within the **Likely Zone of Influence** and states that further assessment is required.

This is significant.

It confirms that the relationship between the proposed development and the NHA is sufficiently close that a potential effect cannot be excluded simply by reference to the fact that development infrastructure lies outside the designated boundary.

The EIAR states that the nearest proposed infrastructure is an access road approximately 50 m from the NHA. It then relies upon the *Peatland Code (IUCN 2023)* proposition that peatland is considered drained where it is within 30 m of an artificial drain or a natural drain formed by the presence of a hagg and gully. On that basis, together with the presence of existing commercial forestry and drains, it concludes that there is no potential for a significant drainage effect from the proposed infrastructure.

The CLG considers that this reasoning requires careful scrutiny.

A 30 m drainage criterion should not be treated as proof of hydrological separation

The fact that proposed infrastructure is approximately 50 m from the NHA, while the cited Peatland Code refers to a 30 m drainage influence, does not in itself demonstrate that the development is hydrologically disconnected from the designated bog.

The relevant question is the actual hydrological and hydrogeological relationship between the proposed works and the NHA.

Peatland hydrology is influenced by topography, peat depth, underlying mineral soils and geology, existing artificial drainage, groundwater movement and the direction and connectivity of surface and subsurface flow.

A generic distance criterion can assist assessment, but it cannot substitute for site-specific evidence where development occurs immediately adjacent to a nationally protected hydrologically dependent habitat.



This is particularly relevant because the proposed development would introduce additional excavation and drainage into an already modified forestry drainage environment.

The existence of existing drains does not necessarily demonstrate that further drainage effects will be insignificant. Existing drainage may itself mean that the remaining hydrological regime is already subject to pressure and therefore requires careful protection from additional alteration.

The statutory protection of the NHA extends to interference with its hydrology

The wider planning record contains specific evidence concerning the statutory designation of Gortacullin Bog NHA.

The Hydro-G evidence prepared in relation to the adjoining Oatfield proposal identifies **S.I. No. 434/2005**, the designation instrument for Gortacullin Bog NHA, and draws particular attention to Schedule 2, Article 3, which prohibits:

“Drainage works or water abstraction affecting the hydrology of the site.”

This wording is important.

The prohibition is not expressed as being confined to drainage works physically undertaken **within** the NHA.

Indeed, the same evidence notes that Article 4 expressly uses the word “within” when addressing alteration of the banks, bed or flow of a lake, pond or watercourse, whereas the hydrological provision is framed in terms of drainage works **affecting the hydrology of the site**.

Accordingly, the planning assessment must address whether works outside the NHA boundary are capable of altering its hydrological regime.

Physical separation from the designation boundary is therefore not determinative.

Forestry felling introduces an acknowledged potential effect

There is also an important qualification within the Applicant's own EIAR.



While Chapter 6 concludes that the proposed infrastructure will not significantly affect the NHA through drainage, it expressly states:

“However, a potential for significant effect to the NHA as a result of adjacent felling works required for the Proposed Development (associated with the Biodiversity Management Plan) has been identified.”

This is a material acknowledgement.

The Applicant's own assessment therefore identifies a potential significant pathway to Gortacullin Bog arising from an integral component of the proposed development.

Forestry felling can alter hydrological conditions through changes in interception, evapotranspiration, soil disturbance and the operation or modification of forestry drainage systems. It can also increase the potential for sediment and nutrient mobilisation during and following felling.

Accordingly, the assessment of Gortacullin Bog cannot be confined to the physical footprint of turbine and access-road infrastructure.

The entire package of works capable of altering the surrounding hydrological regime must be considered.

Compensation and biodiversity works must themselves be assessed as development effects

There is a particular complexity because some of the forestry works close to Gortacullin Bog arise from the Applicant's proposed biodiversity compensation and enhancement measures.

Those measures are intended to produce ecological benefits, particularly for Hen Harrier.

However, a measure intended to mitigate an effect upon one ecological receptor cannot be assumed to be environmentally beneficial in all respects.

If forestry removal or peatland restoration undertaken as part of the Biodiversity Management Plan has the potential to alter drainage or water movement affecting Gortacullin Bog NHA, that effect must itself be assessed.



The Applicant's own recognition of a potential significant effect from adjacent felling confirms the importance of this issue.

The Commission should therefore be satisfied that the proposed compensation strategy for one environmental receptor does not create or increase risk to another nationally protected receptor.

Catchment mapping alone does not necessarily determine peatland hydrology

HES relies materially upon catchment mapping and drainage direction in rejecting a significant hydrological pathway.

Catchment mapping is an essential part of the assessment, but mapped surface-water catchments do not necessarily provide a complete representation of the hydrological functioning of an upland peatland.

The hydrological condition of blanket bog can be influenced by local shallow groundwater, peat drainage, subsurface flow and the relationship between the bog and its surrounding landform.

The Hydro-G evidence elsewhere in the planning record specifically argues that the hydrology and hydrogeology of Gortacullin Bog require assessment in the context of the **surrounding landscape**, rather than solely within the mapped NHA boundary.

The Commission should therefore be satisfied that HES's conclusion is supported by sufficiently detailed field evidence regarding the actual direction and nature of surface and subsurface flows close to the NHA.

The proximity of the adjoining Oatfield development increases the cumulative significance

The cumulative context is particularly important at Gortacullin Bog.

The NHA lies within the same upland landscape affected by the proposed Knockshanvo and Oatfield developments.

The Hydro-G assessment of the Oatfield proposal identifies turbine T11 as approximately **0.1 km from the edge of Gortacullin Bog NHA** and specifically raises



concern regarding the potential for construction activity to affect the hydrology of the designated bog.

This means that the Commission cannot consider Knockshanvo's hydrological relationship with Gortacullin Bog entirely in isolation.

If development and associated drainage or forestry works occur on more than one side of the same hydrologically sensitive peatland system, the cumulative potential for alteration becomes particularly important.

The relevant question is whether the **combined development environment** could alter the water regime of the NHA, even where the effect attributed separately to each project is predicted to be limited.

This requires consideration of cumulative drainage, forestry felling, road construction, excavation and associated changes to runoff and shallow groundwater conditions across the wider landscape.

CLG Conclusion

The Further Information does not provide sufficient certainty to remove the concerns regarding the hydrological protection of Gortacullin Bog NHA.

The Applicant's own EIAR confirms that:

- Gortacullin Bog is a **nationally important peatland**;
- it directly borders the proposed development site;
- proposed infrastructure approaches to approximately **50 m** of the NHA;
- the NHA falls within the **Likely Zone of Influence** of the proposed development; and
- a **potential significant effect from adjacent forestry felling associated with the Biodiversity Management Plan has been identified**.

These findings require a precautionary and site-specific assessment of the hydrological relationship between the proposed works and the designated peatland.

The Applicant's reliance upon drainage direction, catchment mapping and the approximately 50 m separation from infrastructure does not, in itself, demonstrate hydrological independence, particularly where a generic 30 m drainage criterion forms part of the reasoning.



This is reinforced by the statutory protection afforded to Gortacullin Bog NHA. The designation instrument expressly addresses **“Drainage works or water abstraction affecting the hydrology of the site”**, demonstrating that the relevant concern extends beyond works physically undertaken within the NHA boundary.

The cumulative relationship with Oatfield is also material. Hydro-G identifies Oatfield infrastructure approximately 0.1 km from the NHA and raises the same fundamental issue concerning potential alteration of the bog's hydrological regime.

Accordingly, the CLG submits that the Commission should not conclude that significant hydrological effects upon Gortacullin Bog NHA have been excluded unless it is satisfied, on the basis of **site-specific field evidence addressing surface water, shallow groundwater, peat drainage, forestry felling and cumulative development**, that the proposed works will not adversely alter the hydrological conditions supporting the designated peatland.

Given the nationally protected status of Gortacullin Bog and the fundamental dependence of blanket bog habitat upon its hydrological regime, this remains a **critical consideration in the determination of the application**.

Response 34 – Water Framework Directive Compliance

Applicant's Response

Further Information Document FI-2, Appendix 2 – HES Response, *Water Framework Directive*, internal appendix pages.

The Applicant, through **Hydro-Environmental Services (HES)**, responds to concerns that the proposed development could cause deterioration in the status of affected surface-water or groundwater bodies or otherwise compromise achievement of the environmental objectives established under the **Water Framework Directive (WFD)**.

The Applicant maintains that the hydrological and hydrogeological assessment has considered the relevant water bodies, their existing status, potential pathways from the



proposed development and the measures incorporated into the design to protect water quality and hydrological conditions.

HES relies upon the drainage design, watercourse buffers, settlement and attenuation measures, pollution-prevention controls, construction-stage monitoring and other mitigation contained within the EIAR and Construction and Environmental Management Plan.

On that basis, the Applicant maintains that the proposed development will **not cause deterioration in the status of any relevant water body and will not prevent the achievement of the applicable WFD objectives.**

Issue

Whether the Applicant has demonstrated, with the degree of certainty required under the Water Framework Directive, that the proposed development will not cause deterioration of any relevant surface-water or groundwater quality element and will not compromise achievement of the environmental objectives applicable to the affected water bodies, particularly having regard to peat disturbance, drainage works, sediment mobilisation and the cumulative development context.

CLG Assessment

The WFD issue requires consideration separately from the more general conclusion that significant hydrological effects are unlikely.

The legal and environmental test under the Water Framework Directive is not simply whether an effect is sufficiently large to be classified as significant under conventional EIA methodology.

The relevant question is whether the development is capable of causing a **deterioration in water-body status or preventing achievement of the environmental objectives applicable to the water body.**

Accordingly, a conclusion of “no significant effect” under an EIAR significance matrix does not, without further analysis, necessarily establish WFD compliance.



The WFD assessment must address the relevant quality elements

The Applicant's conclusion is dependent upon its assessment of the affected water bodies and the pathways through which the proposed development could influence them.

For surface waters, this includes potential effects associated with:

- suspended sediment;
- altered runoff;
- changes to drainage;
- nutrient mobilisation;
- accidental pollution;
- forestry felling;
- peat excavation and management; and
- construction of roads, turbine foundations and other infrastructure.

For groundwater, the assessment must consider potential changes to groundwater quality and quantitative conditions, including potential effects associated with excavation, drainage and interaction with shallow groundwater systems.

The Commission should therefore be satisfied that the WFD conclusion has been reached at the level of the relevant water-body **quality elements**, rather than simply by transferring the overall EIA significance conclusion into the WFD assessment.

Peat disturbance presents a particular water-quality pathway

The proposed development involves substantial construction activity within an upland peatland and commercial forestry environment.

Excavation and disturbance of peat can create significant potential pathways for mobilisation of suspended solids and organic material into receiving watercourses.

The Applicant proposes extensive mitigation, including drainage controls, settlement systems, watercourse buffers and construction monitoring.

Those measures are appropriate.

However, the importance of the WFD assessment lies in determining whether those measures provide sufficient certainty that deterioration will actually be prevented.



This is particularly relevant where mitigation requires continuous and effective implementation throughout construction and where the consequences of failure can extend downstream beyond the immediate development footprint.

The Commission should therefore distinguish between the **existence of a mitigation measure on paper** and demonstrated confidence that the combination of design, construction controls and monitoring is sufficient to prevent deterioration of the receiving water environment.

Forestry felling must form part of the WFD assessment

Forestry felling is also relevant.

As already identified under RR-33, the Applicant's own biodiversity assessment recognises the potential for significant effects associated with forestry felling adjacent to Gortacullin Bog NHA.

Forestry removal can affect runoff, sediment mobilisation, nutrient release and local hydrological conditions.

Where felling is required either to facilitate development infrastructure or as part of biodiversity compensation and enhancement measures, those works remain part of the environmental consequences of the proposed development.

They must therefore be fully incorporated into the WFD assessment.

The fact that some forestry removal is proposed for an ecological compensation purpose does not remove the requirement to demonstrate that it will not cause deterioration of the receiving water environment.

Monitoring cannot substitute for prevention of deterioration

The Applicant relies in part upon water-quality monitoring.

Monitoring is necessary and provides an important mechanism for identifying unexpected changes during construction.

However, the WFD obligation is fundamentally preventative.

Monitoring which identifies deterioration after it has occurred does not itself establish compliance with the requirement to prevent that deterioration.



Accordingly, monitoring should operate as verification of an already robust pollution-prevention and drainage strategy, rather than as the principal mechanism upon which the conclusion of no deterioration depends.

This is particularly important where the Applicant proposes adaptive responses to monitoring results.

Adaptive management can provide an additional safeguard, but it cannot substitute for sufficient certainty at the planning stage that the principal construction and drainage strategy is capable of preventing deterioration.

The assessment must account for hydrological uncertainty identified elsewhere

The WFD conclusion is also dependent upon the reliability of the underlying hydrological baseline.

The HES defends the extent of rainfall, flow, water-quality, groundwater and catchment data relied upon for the assessment.

Similarly, RR-32 identifies uncertainty regarding private drinking-water receptors, while RR-33 addresses the hydrological relationship with Gortacullin Bog NHA.

These matters are relevant because the WFD assessment cannot be more certain than the hydrological model and baseline information upon which it depends.

Where uncertainty remains concerning flow pathways, groundwater/surface-water interaction or the response of peatland hydrology to development, that uncertainty must be reflected in the confidence attached to the WFD conclusion.

Cumulative effects are particularly important

The cumulative context is again material.

In this report **Cumulative Hydrology** is identified as a Critical response, stating that HES maintains Oatfield and other relevant projects were included and that no significant cumulative water effect arises.

This is particularly important for WFD purposes because water bodies receive effects according to hydrological catchments rather than planning application boundaries.



Where Knockshanvo and Oatfield drain towards the same receiving water environment, the relevant question is the combined pressure potentially exerted upon that water body.

The WFD assessment should therefore consider the environmental condition of the receiving water body after the reasonably foreseeable effects of all relevant developments are taken into account.

A project-specific conclusion that Knockshanvo alone will not cause significant deterioration is insufficient if cumulative pressures from adjoining development could alter the status or quality elements of the same receiving water body.

The exceptionally close relationship between Knockshanvo and Oatfield makes this particularly important.

WFD compliance requires a precautionary conclusion

The Applicant's conclusion is categorical: the development will not cause deterioration and will not prevent achievement of WFD objectives.

Such a conclusion requires a robust evidential basis.

The Commission should therefore be satisfied that all reasonably foreseeable pathways have been adequately assessed and that the proposed mitigation is sufficiently specific, effective and enforceable to prevent deterioration.

Where the assessment depends upon construction-stage management, the necessary controls should be clearly established before permission rather than left to substantive redesign or development of mitigation after consent.

Broadford Wastewater Infrastructure – Changing Environmental Baseline

A further material development has arisen since preparation of the Applicant's EIAR and cumulative assessment. Uisce Éireann is progressing strategic wastewater infrastructure for Broadford, involving the construction and operation of a wastewater treatment plant and a treated discharge to the receiving surface-water environment.

This is relevant not merely in terms of construction traffic. It represents a material change in the future environmental baseline against which the cumulative effects of the proposed Knockshanvo development must be considered.



The Applicant's hydrological, water-quality and Water Framework Directive assessments, including the proposed mitigation measures, were prepared without assessment of the future treated discharge associated with this infrastructure. The Commission should therefore be satisfied that the cumulative assessment remains valid having regard to the altered loading and assimilative capacity of the receiving surface-water environment and any potential interaction with construction drainage, sediment, nutrients or other pollutants associated with the proposed development.

This issue assumes additional significance when Knockshanvo is considered together with the adjoining Oatfield Wind Farm and the wastewater infrastructure. These are substantial projects capable of affecting the same wider receiving environment, and the cumulative assessment should reflect the environmental baseline reasonably expected to exist during their construction and operation rather than a baseline which has subsequently changed.

CLG Conclusion

The Applicant maintains that the proposed Knockshanvo Wind Farm will **not cause deterioration of any relevant water body and will not prevent achievement of Water Framework Directive objectives**. This as a Critical issue.

The Applicant has undertaken a WFD assessment and has incorporated substantial drainage, pollution-prevention and monitoring measures into the proposed development.

However, WFD compliance cannot be established solely by demonstrating that the overall hydrological effect has been classified as non-significant under the EIAR.

The Commission must be satisfied that the development will not cause deterioration of the relevant water-body quality elements and will not compromise achievement of their applicable environmental objectives.

That assessment must take full account of the potential effects associated with **peat excavation, drainage, forestry felling, sediment mobilisation, groundwater interaction and construction activity**, together with the effectiveness and enforceability of the mitigation upon which the Applicant relies.

The cumulative context is also material. Water bodies and hydrological catchments do not correspond to individual planning boundaries, and the close relationship between



Knockshanvo, Oatfield and other development affecting the same receiving environment must therefore form part of the WFD assessment.

Accordingly, the CLG submits that the Applicant's categorical conclusion of WFD compliance should only be accepted if the Commission is satisfied, on the basis of the complete hydrological evidence and cumulative assessment, that **deterioration has been excluded at the level of the relevant water-body quality elements and that the development will not impede achievement of WFD objectives.**

In light of the unresolved hydrological matters identified elsewhere in this submission, including those concerning Gortacullin Bog NHA, private water supplies and cumulative hydrology, the Applicant's WFD conclusion **cannot be treated as a standalone finding independent of those underlying uncertainties.**

Response 35 – Background Noise Methodology

Applicant's Response

Further Information Document FI-2, Appendix 3 – AWN Consulting Response, Section 2.3 – *Background Noise Measurements and Analysis*, p. 2-3.

The Applicant, through **AWN Consulting Ltd**, responds to the concerns raised by East Clare Environment Protection CLG regarding the methodology used to establish existing background noise levels, including the use of the **LA90,10min** parameter and the manner in which the results of the background-noise survey were presented and subsequently used in the operational noise assessment.

AWN states that the background-noise measurements were undertaken in accordance with the **Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (IoA GPG, 2013)** and the accompanying **Supplementary Guidance Note 1: Data Collection (2014)**. It further states that analysis of the collected data was undertaken in accordance with the same guidance and that the detailed results are contained in Appendix 12-7 of the EIAR.



The original EIAR records that unattended sound-level monitoring was undertaken at **seven representative locations** surrounding the proposed development. The monitoring locations were selected having regard to the predicted 35 dB LA90 turbine-noise contour, site visits, discussions with local residents, aerial imagery and other available information.

The Applicant also states that data collected during periods when individual monitoring locations were downwind of existing operational wind turbines was filtered out in accordance with the IoA GPG, in order to prevent existing turbine noise from artificially influencing the measured background-noise environment.

In response to the CLG's concern that predicted turbine-noise levels were not presented directly alongside the measured background-noise levels, AWN states:

“presentation of the predicted wind farm noise levels in the background noise graphs would not change the outcome of the assessment.”

AWN explains that the measured background levels are used to establish the applicable wind-turbine noise criteria and that the predicted turbine-noise levels are subsequently assessed against those criteria.

The Applicant therefore maintains that the background-noise survey, the use of LA90,10min, the monitoring locations, data treatment and derivation of background-noise curves are consistent with established wind-farm noise-assessment practice and provide an adequate basis for determining the applicable operational noise limits.

Issue

Whether the Applicant's confirmation that its background-noise assessment follows ETSU-R-97 and the IoA Good Practice Guide adequately addresses the substantive concern regarding the representativeness and transparency of the baseline noise assessment, particularly where those measured background levels are used to derive the operational noise criteria against which the acceptability of the proposed development is subsequently determined.



CLG Assessment

The CLG accepts that **LA90,10min is the conventional background-noise parameter used within the ETSU-R-97 methodology** and that its use is consistent with the IoA Good Practice Guide.

Accordingly, the CLG does not maintain that the assessment is invalid merely because AWN has used LA90 rather than another acoustic parameter.

The more important issue is the role that the background-noise measurements perform within the Applicant's assessment and whether the Further Information has adequately addressed the substantive concerns raised regarding transparency and the resulting change in the acoustic environment.

Background noise is fundamental to the Applicant's operational noise limits

The Applicant's own EIAR describes identification of baseline noise levels through on-site noise surveys as a “**critical aspect**” of wind-energy noise assessment.

It explains that ETSU-R-97 establishes operational noise limits partly by reference to the existing background-noise environment and that regression analysis of measured LA90,10min data against wind speed is used to derive the applicable daytime and night-time background-noise curves.

The accuracy and representativeness of the background-noise assessment are therefore not secondary matters.

They directly influence the limits against which predicted turbine noise is assessed.

The EIAR subsequently uses the measurements from the seven monitoring locations to derive noise criteria for surrounding noise-sensitive locations. For locations at which monitoring was not undertaken, the Applicant states that it applies a background-noise envelope based upon the **lowest average levels across the monitoring locations at each wind speed**, considered separately for daytime and night-time.

This is a relatively conservative approach for unmonitored receptors and should be acknowledged.



However, it does not remove the need to understand clearly the magnitude of the change from the existing acoustic environment which would occur at the representative monitored locations themselves.

The Applicant does not dispute the underlying background-noise figures

The Further Information does not identify any error in the background-noise figures relied upon by the CLG.

The EIAR's Table 12-11 demonstrates that the existing environment is particularly quiet at a number of monitoring locations, especially during night-time periods.

For example, the derived night-time LA90,10min background levels at a standardised wind speed of 4 m/s are:

- **Location A – 25.2 dB;**
- **Location B – 19.5 dB;**
- **Location C – 25.2 dB;**
- **Location D – 21.9 dB;**
- **Location E – 20.9 dB;**
- **Location F – 25.7 dB; and**
- **Location G – 20.2 dB.**

At 5 m/s, several locations remain between approximately **20.7 dB and 26.7 dB LA90,10min.**

These are objectively low background-noise levels.

They establish that parts of the receiving environment presently experience a very quiet night-time acoustic environment.

That baseline is important when assessing the environmental change which would result from the proposed development.

Compliance with a derived limit and magnitude of environmental change are different questions

The Applicant's response focuses upon the methodological sequence:

background noise → derived criterion → predicted turbine noise → compliance assessment.



That is the ETSU-based compliance methodology.

However, the CLG's concern also relates to the **magnitude of the change in the existing acoustic environment**.

Those are not identical questions.

The Applicant's own EIAR proposes, in summary:

- **40 dB LA90,10min** in quiet environments with typical background noise below 30 dB;
- **45 dB LA90,10min or background +5 dB**, whichever is higher, in other daytime circumstances; and
- **43 dB LA90,10min or background +5 dB**, whichever is higher, for night-time periods.

Consequently, a predicted turbine-noise level may comply with the adopted criterion while nevertheless representing a substantial increase over the existing measured acoustic environment.

This point is also recognised in the planning record by the National Environmental Health Service, which observes that application of the 2006 Guidelines can potentially result in a predicted increase of **up to 15 dB(A)** in the existing noise environment while remaining compliant with the criteria.

That distinction is highly material to EIA.

Numerical compliance with a planning noise criterion is relevant to acceptability, but the environmental assessment should also transparently identify the **nature and magnitude of the change from baseline conditions**.

The CLG's comparison was intended to expose that change

The original CLG submission extracted the Applicant's own daytime and night-time background-noise figures and compared them with the predicted cumulative turbine-noise levels.

The purpose of that exercise was to demonstrate the actual difference between the existing acoustic environment and the cumulative environment predicted if the relevant wind farms become operational.

AWN does not challenge the underlying figures used in that comparison.



Instead, it responds that placing predicted turbine-noise levels directly onto the background-noise graphs:

“would not change the outcome of the assessment.”

That response does not fully address the point raised.

The issue is not simply whether combining the information graphically would alter AWN's mathematical compliance conclusion.

The issue is whether presenting the information together would allow the Commission and the public to understand more readily the **scale of the predicted alteration to the existing noise environment**.

For EIA purposes, that is relevant information in its own right.

The baseline should not be obscured by the derived compliance threshold

Once the measured background levels have been converted into operational noise criteria, there is a risk that attention becomes focused exclusively upon whether the predicted turbine noise falls below the resulting limit.

That can obscure the original baseline.

For example, where an existing night-time background environment is approximately 20–25 dB LA90, a predicted cumulative turbine-noise level approaching 40 dB represents a materially different acoustic environment even if the applicable ETSU-derived criterion is higher.

The CLG is not suggesting that the numerical difference between background and predicted turbine noise can automatically be equated with annoyance or that decibel values should be interpreted as a simple linear scale.

Rather, the point is that the **change from baseline should itself be transparently identified and assessed**.

This is consistent with the fundamental purpose of environmental impact assessment, which is to identify and evaluate the likely significant effects of the proposed development upon the receiving environment.



Representativeness of the seven monitoring locations remains important

The Applicant states that seven monitoring locations were selected to represent noise-sensitive locations surrounding the site and that selection was informed by modelling, site visits, discussions with local residents and review of aerial imagery.

That is a recognised methodology.

However, the seven locations represent a substantially larger number of surrounding noise-sensitive receptors.

The reliability of the assessment therefore depends upon those locations being genuinely representative of the acoustic environments to which their derived background curves are subsequently applied.

The Applicant's use of the lowest background-noise envelope for remaining locations provides an element of conservatism.

Nevertheless, where a particular receptor has materially different local acoustic characteristics, the use of a representative curve cannot necessarily reproduce the actual baseline experienced at that property.

This reinforces the need for clear post-consent monitoring provisions if permission were granted, particularly at receptors predicted to experience the highest cumulative turbine-noise levels.

The cumulative context increases the importance of an accurate baseline

The Applicant's original background-noise survey necessarily measured the acoustic environment existing at the time of monitoring.

Several other wind farms included in the cumulative assessment, including Oatfield, were not operational and therefore did not form part of that measured background environment.

The Applicant correctly states that there was consequently no requirement to filter those non-operational developments from the monitoring data.

However, this creates an important distinction between:



- the **existing measured acoustic baseline**; and
- the **future cumulative turbine-noise environment** if Knockshanvo, Oatfield and other relevant developments operate.

The Commission should ensure that this distinction remains clearly visible in its assessment.

The cumulative noise environment should not be understood merely by reference to compliance with a derived limit. The degree to which it would alter the existing rural acoustic environment is also a material environmental effect.

Representativeness of Background Noise Monitoring Locations

The Applicant's assessment identifies **526 Noise Sensitive Locations within 3 km of the proposed turbines**, while the background noise environment used to derive the applicable assessment criteria was established from measurements undertaken at **seven representative monitoring locations**.

The CLG accepts that it is neither necessary nor standard practice to undertake background noise monitoring at every individual dwelling and that the use of representative monitoring locations is consistent with established wind turbine noise assessment methodology. The issue is therefore not the number of monitoring locations in itself, but whether those locations are sufficiently representative of the materially different acoustic environments experienced across the wider study area.

This is particularly relevant at Knockshanvo given the extent and character of the receiving environment. Residential receptors are distributed across an upland and rural landscape containing differing elevations, topographical screening, vegetation, proximity to roads and other local noise sources, and differing degrees of exposure to wind. These factors can materially influence existing background noise levels.

The Applicant's own description of the baseline monitoring locations identifies **wind-generated noise from local foliage**, together with road traffic and residential activity, as contributors to the measured background environment. The presence of such sources does not invalidate the measurements; they form part of the existing acoustic environment. However, it does mean that the Commission should be satisfied that a background curve obtained at a monitoring location materially influenced by vegetation or other local noise sources has not been applied to receptors whose actual environment is appreciably quieter.

This issue is particularly important because the Applicant's measurements demonstrate that parts of the receiving environment are already **exceptionally quiet**, with derived



night-time background levels at some monitoring locations falling to approximately **20–25 dB LA90,10min at lower wind speeds**. In such circumstances, relatively small differences in the background curve applied to an unmonitored receptor can materially affect both the assessment criterion and the apparent magnitude of change between the existing and predicted acoustic environments.

The CLG therefore does not contend that the seven-location monitoring programme is invalid simply because it does not measure every NSL. Rather, the Commission should be satisfied that the Applicant has demonstrated a clear and technically justified relationship between each monitoring location and the unmonitored receptors to which its background-noise data are applied, taking account of **topography, elevation, vegetation, exposure and existing local noise sources**.

Treatment of Transient and Weather-Related Noise

The Applicant states that the monitoring and analysis were undertaken in accordance with the Institute of Acoustics Good Practice Guide and associated supplementary guidance. The CLG therefore does not suggest, without supporting evidence, that the dataset is generally “contaminated” by rainfall, traffic, agricultural activity or other transient sources.

Nevertheless, because the derived background curves ultimately influence the operational noise criteria against which the development is assessed, the Commission should be satisfied that the data-selection and filtering process adequately excluded **rainfall and atypical or transient events** where these were not representative of the ordinary background acoustic environment.

This is particularly relevant where polynomial regression curves are derived from a relatively limited number of representative locations and subsequently applied to a much larger population of unmonitored receptors. The reliability of the resulting assessment depends not only upon compliance with the prescribed methodology, but also upon the underlying retained dataset being genuinely representative of the acoustic conditions it is intended to characterise.

CLG Conclusion

The Further Information confirms that the Applicant's background-noise survey was undertaken using the **LA90,10min parameter in accordance with ETSU-R-97, the IoA Good Practice Guide (2013) and Supplementary Guidance Note 1 (2014)**.



The CLG accepts that this is an established methodology for deriving wind-turbine noise criteria and does not contend that use of LA90,10min is, of itself, technically inappropriate.

However, the Applicant's response does not fully address the substantive concern.

The Applicant's own measurements demonstrate a **very quiet existing acoustic environment**, particularly at night, with several monitoring locations recording derived background levels in the region of approximately **20–25 dB LA90,10min at lower wind speeds**.

Those baseline conditions are environmentally relevant independently of the operational limits subsequently derived from them.

AWN's statement that presenting predicted turbine-noise levels alongside the background-noise results would not alter the outcome of its compliance assessment misses this distinction.

The relevant question is not solely whether the development can comply with an ETSU-derived numerical criterion. The Commission must also understand the **magnitude of the change from the existing acoustic environment**, particularly in circumstances where the planning record recognises that substantial increases above background can nevertheless remain technically compliant with the adopted criteria.

Accordingly, the CLG submits that the Applicant's background-noise measurements should be considered directly alongside the predicted **cumulative** turbine-noise levels when the Commission assesses the likely effect upon residential amenity and population and human health.

Compliance with a derived noise limit should not be treated as synonymous with the absence of a material environmental effect.

The background-noise methodology therefore remains a **critical component of the noise assessment**, not because the use of LA90 is inherently defective, but because the measured baseline establishes the exceptionally quiet acoustic environment against which the actual environmental change arising from Knockshanvo and the cumulative wind-energy developments must be judged.

Finally, given that seven monitoring locations are used to characterise background conditions relevant to 526 identified NSLs, and given the exceptionally low background levels recorded in parts of the study area, the Commission should be satisfied that each monitoring location is demonstrably representative of the receptors to which its derived



background curve is applied. Particular care is required where vegetation, traffic or other local sources materially influence a monitoring location but may not be present to the same degree at the unmonitored receptors represented by that location.

Response 36 – Sunyata Buddhist Retreat Centre: Noise and Tranquillity

Applicant's Response

Further Information Document FI-2, Appendix 3 – AWN Consulting Response, Section 2.4 – Sunyata Buddhist Retreat Centre, p. 2-3 to 2-4.

The Applicant, through **AWN Consulting Ltd**, responds specifically to the concerns raised by East Clare Environment Protection CLG regarding predicted operational wind turbine noise at the **Sunyata Buddhist Retreat Centre**.

AWN confirms that the Centre was included directly within the noise assessment. It was used as **baseline noise monitoring Location A** and is identified as **Noise Sensitive Location H310** in the predicted noise-level tables.

AWN states:

“The noise criteria applied to the Centre treat this location as permanent residence in terms of the protection of amenity, i.e. the same as all other locations.”

AWN further states that the **worst-case cumulative predicted noise level at H310 is 38.5 dB LA90**, as presented in Appendix 12-9 of the EIAR, and concludes that this level is within the applicable noise criteria for the location.

The Applicant therefore maintains that the Sunyata Buddhist Retreat Centre has been appropriately identified and assessed as a noise-sensitive receptor and that the predicted cumulative operational noise complies with the applicable criteria.



Issue

Whether treating the Sunyata Buddhist Retreat Centre in the same manner as an ordinary permanent residential receptor, and demonstrating compliance with the applicable residential noise criterion, adequately assesses the effect of operational and cumulative wind turbine noise upon a receptor whose established function is specifically dependent upon **peace, silence and tranquillity**.

CLG Assessment

The Applicant has clarified an important factual matter.

The CLG accepts that the Sunyata Buddhist Retreat Centre was **not omitted from the Applicant's noise model**. It was used as background-noise monitoring Location A and is expressly included as NSL H310.

Accordingly, the issue is not whether the Centre was geographically included in the acoustic assessment.

The substantive issue is whether the **nature and sensitivity of the receptor** have been adequately reflected in the assessment of significance.

Sunyata is not simply an ordinary residential receptor

The Applicant states that the Centre has been afforded the same protection as a permanent residence.

For a conventional dwelling, that would ordinarily represent an appropriate and precautionary approach.

However, Sunyata has a materially different function.

Sunyata is not simply accommodation situated in a quiet rural location. It is a Buddhist retreat centre operating within the Thai Forest tradition, in which silence, contemplation and insight meditation are central to the activities undertaken at the Centre. The absence of ordinary sources of internal domestic noise means that the existing external acoustic environment forms an unusually important component of the experience and function of the property.



Accordingly, tranquillity at Sunyata is not merely a desirable residential amenity. It is intrinsic to the established use of the Centre. An externally generated noise source which may be regarded as acceptable when assessed against a conventional residential criterion may therefore have a materially different effect at this receptor. This distinction is particularly important given that the Applicant's own baseline measurements demonstrate the exceptionally quiet existing acoustic environment at Sunyata.

The Applicant's own EIAR describes the Centre as being located approximately **90 m from the north-western boundary of the proposed Wind Farm Site** and confirms that it:

“offers residential retreats and a wide variety of other events to those who wish to learn about Buddhism, mindfulness and meditation.”

The Applicant's main Further Information response similarly acknowledges that concerns were raised because the EIAR had failed to recognise adequately the **tranquil nature of the property**. It accepts that Sunyata is a retreat centre providing residential retreats associated with Buddhism, mindfulness and meditation.

The particular environmental quality provided by the Centre is therefore not incidental to its use.

Tranquillity is an integral component of the receptor itself.

The question is consequently not confined to whether turbine noise remains below a limit considered acceptable for ordinary residential occupation.

The Commission must also consider whether the predicted change in the acoustic environment would materially affect the function and amenity for which this particular receptor exists.

The Applicant's own measurements demonstrate an unusually quiet environment

Sunyata is particularly important because, unlike many other receptors, the Applicant has **site-specific measured background-noise data at the Centre itself**.

It is Location A in the baseline survey.

The CLG's original submission compared those measured background-noise levels directly with the Applicant's predicted cumulative operational noise levels. It identified



that the predicted cumulative turbine-noise level exceeds the measured background level at **every assessed night-time wind speed** and at four of the seven assessed daytime wind speeds.

The Applicant predicts the following cumulative turbine-noise levels at H310:

Standardised wind speed	Predicted cumulative noise
3 m/s	26.9 dB LA90
4 m/s	28.7 dB LA90
5 m/s	33.0 dB LA90
6 m/s	37.4 dB LA90
7 m/s	38.4 dB LA90
8 m/s	38.5 dB LA90
9 m/s	38.5 dB LA90

These are the Applicant's own predicted cumulative values reproduced in the CLG submission from Appendix 12-9 of the EIAR.

The CLG specifically identified that at wind speeds of 6 and 7 m/s the predicted cumulative levels are approximately **10 dB or more above the measured night-time background levels**.

AWN does not dispute those figures in the Further Information.

Its response is instead that the maximum predicted cumulative level of 38.5 dB LA90 remains within the applicable criterion.

That does not fully address the environmental effect identified by the CLG.

Compliance does not establish preservation of tranquillity

The distinction identified under RR-35 is particularly important at Sunyata.

There are two separate questions:

1. **Will the predicted turbine noise comply with the applicable numerical noise criterion?**
2. **What effect will the predicted noise have upon the existing acoustic character and function of the receptor?**



AWN principally answers the first.

The CLG's concern relates materially to the second.

A noise level may comply with a criterion designed to protect ordinary residential amenity while still materially altering an environment whose defining characteristic is quietness and tranquillity.

This is not an argument for inventing a separate numerical wind-turbine noise limit specifically for Buddhist centres.

Rather, it is an issue of **receptor sensitivity and impact significance under EIA**.

The existing environmental conditions and the function of the affected receptor must form part of the assessment of the effect.

At Sunyata, the Applicant has unusually strong evidence with which to undertake that assessment because it actually measured the existing acoustic environment at the Centre.

Yet the Further Information does not provide a substantive assessment of whether the predicted increase over that measured baseline is compatible with the Centre's established use as a residential meditation and retreat facility.

The Applicant expressly acknowledges the Centre's tranquil function elsewhere

There is an important inconsistency between the Applicant's broader response and the AWN assessment.

In FI-1, the Applicant expressly states:

“the tranquil nature of the SBM has been fully acknowledged and considered within the EIAR”

and maintains that a comprehensive assessment of noise, shadow flicker and visual effects has been undertaken.

However, the AWN response demonstrates that, for noise purposes, the Centre is simply treated:



“as permanent residence in terms of the protection of amenity, i.e. the same as all other locations.”

Those two propositions are not necessarily equivalent.

Identifying Sunyata as a residential noise-sensitive location ensures that it receives the numerical protection applicable to a dwelling. It does **not demonstrate that its heightened dependence upon a tranquil acoustic environment has been separately assessed.**

The Applicant therefore appears to acknowledge the special nature of the receptor descriptively while applying no corresponding distinction when assessing the significance of the acoustic change.

The cumulative nature of the prediction is important

The CLG acknowledges that the 38.5 dB LA90 figure relied upon by AWN is a **cumulative** prediction rather than a Knockshanvo-only figure.

That is appropriate.

The Applicant's cumulative noise assessment includes Oatfield, Carrownagowan, Lackareagh, Fahybeg and Ballycar.

Accordingly, the predicted noise environment at Sunyata already demonstrates the potential effect of the broader concentration of wind-energy development rather than simply the contribution from Knockshanvo.

This is particularly significant because Sunyata lies within the immediate Knockshanvo/Oatfield landscape.

The Commission should assess the Centre on the basis of the **actual cumulative acoustic environment that may arise**, rather than considering the noise contribution from individual developments in isolation.

Noise must also be considered with the other effects upon the Centre

Sunyata is unusual in that several different effects of the proposed development converge upon the same sensitive receptor.



The Applicant's own Further Information confirms that the Centre is also predicted to experience daily **shadow flicker exceeding the 30-minute WEG threshold in the absence of mitigation**, although turbine-control measures are proposed to eliminate or control that effect.

Landscape and visual effects upon the Centre have also been raised extensively in the planning record.

The CLG's original submission describes Sunyata as a secluded retreat and identifies the proximity of proposed Turbine T02 as approximately **870 m**.

The environmental effect upon the Centre should therefore not be artificially fragmented into unrelated noise, visual and shadow-flicker assessments.

For a facility whose purpose is to provide a peaceful environment for meditation and retreat, the combined alteration of its acoustic, visual and experiential setting is relevant to the assessment of amenity.

CLG Conclusion

The Further Information confirms that the **Sunyata Buddhist Retreat Centre was included in the Applicant's noise assessment** as baseline monitoring Location A and Noise Sensitive Location H310.

The CLG therefore accepts that the Centre was not omitted from the acoustic model.

However, the Applicant's response does not satisfactorily resolve the substantive issue.

AWN treats Sunyata:

“as permanent residence in terms of the protection of amenity”

and relies upon the conclusion that the worst-case cumulative predicted level of **38.5 dB LA90** remains within the applicable numerical criterion.

That establishes predicted compliance with the criterion applied to an ordinary residential receptor. It does not establish that the **existing tranquillity upon which the function of the retreat centre depends will be preserved**.

The Applicant's own measurements demonstrate that Sunyata currently has a particularly quiet acoustic environment. The CLG's comparison of the Applicant's data



shows predicted cumulative turbine noise exceeding measured background noise throughout the assessed night-time wind-speed range, with differences of approximately **10 dB or more at certain wind speeds**.

Those figures are not disputed by AWN.

The Commission should therefore distinguish between **numerical compliance** and the **environmental significance of the change from the existing acoustic baseline**.

This distinction is especially important at Sunyata because tranquillity is not merely a desirable characteristic of a dwelling; it is integral to the established use of the property as a residential centre for meditation, mindfulness and spiritual retreat.

Accordingly, the CLG submits that the Applicant has demonstrated that Sunyata was included in its noise model, but has **not adequately demonstrated that treating this unusually sensitive receptor identically to an ordinary permanent residence provides a complete assessment of the effect upon its particular amenity and function**.

The predicted cumulative alteration of the Centre's existing quiet acoustic environment, considered together with the associated visual and shadow-flicker effects, therefore remains a **material and site-specific consideration in the Commission's assessment of the proposed development**.

Response 37 – Low-Frequency Noise and Infrasound

Applicant's Response

Further Information Document FI-2, Appendix 3 – AWN Consulting Response, Section 2.6.1 – Low-frequency Noise and Infrasound.

The Applicant, through **AWN Consulting Ltd**, responds to concerns raised regarding the potential effects of **low-frequency noise (LFN) and infrasound** generated by the proposed Knockshanvo Wind Farm, including concerns regarding the scale of the proposed turbines and potential effects upon nearby residents.



AWN maintains that the available scientific evidence does not support the proposition that low-frequency noise or infrasound from modern wind turbines, at the separation distances applicable to the proposed development, gives rise to adverse health effects where the development complies with the applicable operational noise criteria.

AWN distinguishes between **low-frequency noise**, which includes sound within the lower part of the audible frequency range, and **infrasound**, generally referring to sound at frequencies below approximately 20 Hz.

The Applicant relies upon published research and established wind-turbine noise guidance to maintain that infrasound produced by wind turbines at residential separation distances is normally at levels substantially below the threshold of human perception and that wind turbines are not a unique source of infrasound.

AWN further maintains that existing wind-turbine noise assessment criteria provide adequate protection against unacceptable low-frequency noise and that there is no technical justification for the application of separate low-frequency or infrasonic noise limits to the proposed development.

The Applicant therefore rejects the contention that the proposed Knockshanvo turbines require a separate LFN or infrasound assessment regime or additional specific limits beyond the operational noise criteria already applied in the EIAR.

Issue

Whether the Applicant's reliance upon the existing scientific literature and conventional overall wind-turbine noise criteria adequately addresses the potential effects of low-frequency noise and infrasound from the proposed development, particularly having regard to the scale of the proposed turbines, the quiet existing acoustic environment and the cumulative presence of the adjoining Oatfield and other wind energy developments.

CLG Assessment

The issue of low-frequency noise and infrasound requires careful treatment.

The CLG does not submit that the mere production of infrasound by wind turbines establishes that adverse health effects will occur. Nor would it be appropriate to assert that all low-frequency or infrasonic sound is inherently harmful.



Infrasound occurs naturally and is generated by numerous environmental and human sources.

The relevant planning question is narrower: **whether the Applicant has adequately assessed the low-frequency characteristics of the proposed and cumulative turbine noise environment and whether its conclusion that no separate assessment or limits are required is sufficiently supported for this particular development.**

The Applicant relies substantially upon general scientific evidence

AWN's response is principally evidence-based rather than project-specific.

Its position is that the scientific literature does not demonstrate adverse health effects from wind-turbine-generated low-frequency noise or infrasound at compliant residential separation distances and that measured infrasound levels from wind turbines are ordinarily below perceptibility thresholds.

That evidence is relevant and must be afforded appropriate weight.

However, general conclusions from the scientific literature do not remove the requirement to assess the characteristics of the **particular development before the Commission.**

The proposed Knockshanvo turbines are very large modern turbines, reaching approximately **185 m tip height**, and would operate in close cumulative proximity to the proposed Oatfield Wind Farm.

Accordingly, the relevant question is not simply whether previous studies of wind turbines have identified harmful infrasound.

It is whether the evidence relied upon by AWN is sufficiently representative of the turbine dimensions, operating characteristics, receptor distances and cumulative configuration proposed at Knockshanvo.

Overall A-weighted noise does not describe the complete frequency spectrum

The principal operational assessment is expressed in **dB LA90**, an A-weighted metric.



A-weighting is deliberately designed to approximate human hearing sensitivity and therefore substantially reduces the contribution of very low frequencies to the resulting numerical value.

This does not make A-weighted assessment inappropriate. It is the established metric used under the applicable wind-energy noise methodology.

However, an A-weighted overall level does not, by itself, provide a detailed description of the **frequency composition** of the sound.

That distinction is directly relevant where the concern being assessed relates specifically to low-frequency noise.

Demonstrating compliance with an overall A-weighted criterion therefore does not logically establish, without supporting evidence, that no particular low-frequency characteristic warrants consideration.

The Applicant's proposition that compliance with the conventional noise criteria provides adequate protection must consequently be supported by evidence demonstrating why that remains appropriate for the turbine technology and receptor circumstances involved.

Audible low-frequency noise and infrasound should not be conflated

The Applicant's response appropriately distinguishes low-frequency noise from infrasound.

This distinction should be maintained in the Commission's assessment.

The proposition that turbine-generated **infrasound** is below the conventional threshold of perception at residential distances does not necessarily answer concerns regarding **audible low-frequency noise**.

The two issues overlap but are not identical.

The relevant question regarding audible low-frequency sound is whether the spectral characteristics of turbine noise could result in a distinctive or intrusive low-frequency component at sensitive receptors, particularly under meteorological or operating conditions favourable to propagation.



Accordingly, evidence showing that infrasonic frequencies are below perception thresholds should not, by itself, be treated as disposing of the wider low-frequency-noise issue.

The scale of the proposed turbines warrants consideration

The proposed turbines are substantially larger than the turbine technology that existed when the **2006 Wind Energy Development Guidelines** were prepared.

Turbine scale does not automatically mean that unacceptable low-frequency noise will arise.

Nevertheless, it is reasonable for the Commission to ensure that evidence used to support conclusions regarding frequency characteristics remains applicable to contemporary turbines of the dimensions proposed.

The Applicant should therefore demonstrate that the scientific literature upon which it relies includes sufficiently representative modern utility-scale turbine technology or otherwise explain why turbine scale does not materially affect the conclusion.

A general statement that wind turbines do not generate harmful levels of infrasound cannot substitute for consideration of whether the evidence is technically applicable to the proposed machines.

The existing quiet acoustic environment remains relevant

As established under **RR-35 – Background Noise Methodology**, the Applicant's own measurements demonstrate particularly low night-time background-noise levels at several monitoring locations.

This matters because the perceptibility and potential intrusiveness of a sound are influenced not solely by its absolute level but also by the acoustic environment within which it occurs.

The CLG does not suggest that a quiet background environment transforms otherwise imperceptible infrasound into a health hazard.

However, the low existing background levels reinforce the importance of accurately characterising the audible operational noise environment, including any distinctive low-frequency component.



The Commission should therefore avoid treating compliance with an overall numerical criterion as a complete description of the resulting acoustic change.

Cumulative low-frequency noise requires consideration

The cumulative context is again particularly important.

Knockshanvo would not operate in isolation if the proposed Oatfield Wind Farm and other relevant developments proceed.

The Applicant's conventional cumulative noise assessment includes Oatfield and other relevant wind farms.

That is appropriate.

However, if the Applicant's position is that a separate frequency-specific assessment is unnecessary, the Commission should be satisfied that this conclusion remains valid for the **combined acoustic contribution of the relevant wind farms**, rather than only for an individual Knockshanvo turbine or the Knockshanvo development considered alone.

The close relationship with Oatfield is especially material because approximately 20 large turbines could ultimately operate within the same upland area.

Where several turbines contribute simultaneously to the acoustic environment at a receptor, the assessment should provide sufficient confidence that cumulative operation does not create a low-frequency characteristic materially different from that assumed in the general literature relied upon by the Applicant.

Health claims require an evidence-based approach

The CLG considers it important that this issue should not be overstated.

The planning record should distinguish between:

- evidence that wind turbines generate low-frequency and infrasonic acoustic energy; and
- evidence that such emissions at residential exposure levels cause particular adverse health outcomes.

Those are not equivalent propositions.



The Commission should determine the matter on the basis of established scientific evidence rather than anecdotal claims alone.

However, the same evidential standard applies to the Applicant.

The absence of established evidence demonstrating a particular causal health effect does not remove the requirement under EIA to **characterise the environmental exposure adequately**.

The Applicant's response therefore needs to establish both that the expected exposure is consistent with the evidence upon which it relies and that the existing assessment framework provides adequate protection for the specific development proposed.

The public-health issue must be considered alongside the HSE response

RR-37 should also be considered together with **RR-24 – HSE / Public Health**.

The HSE raised the broader question of contemporary health-based evidence in relation to wind turbine noise, while the Applicant maintains that the existing planning and acoustic assessment framework remains appropriate.

The CLG does not suggest that the HSE observation establishes that low-frequency noise or infrasound from Knockshanvo will cause adverse health effects.

However, it reinforces the importance of ensuring that the Commission's assessment is informed by **current scientific evidence**, rather than simply assuming that compliance with the older planning framework answers every potential acoustic and public-health issue.

CLG Conclusion

The Applicant maintains that the scientific evidence does not support adverse health effects from wind-turbine-generated low-frequency noise or infrasound at compliant residential separation distances and that **separate low-frequency or infrasound limits are unnecessary**.

The CLG accepts that the existence of wind-turbine-generated infrasound does **not**, in itself, demonstrate an adverse health effect and that infrasound is produced by many natural and anthropogenic sources.



The Commission should therefore avoid conclusions unsupported by established scientific evidence.

However, the Applicant's response relies substantially upon general literature and upon compliance with conventional **A-weighted operational noise criteria**.

An A-weighted overall noise level does not provide a complete description of the low-frequency spectrum, and evidence that infrasonic sound is below conventional perception thresholds does not necessarily address the separate issue of **audible low-frequency noise**.

The proposed development also involves turbines of approximately **185 m tip height** operating within an unusually quiet rural acoustic environment and, potentially, in close cumulative association with a further 11 Oatfield turbines.

Accordingly, the Commission should be satisfied that the scientific evidence relied upon by AWN is **representative of modern turbines of the scale proposed and applicable to the cumulative development scenario**, and that the absence of a separate frequency-specific limit does not leave a material component of the resulting acoustic environment inadequately assessed.

The CLG does not submit that the available evidence establishes that harmful infrasound will occur at Knockshanvo. Rather, it submits that the Applicant's conclusion should be accepted only where the Commission is satisfied that the **specific low-frequency characteristics of the proposed and cumulative turbine noise environment are adequately encompassed within the assessment methodology relied upon**.

Given the very quiet measured baseline, the scale of the proposed turbines, the close cumulative relationship with Oatfield and the broader public-health concerns raised by the HSE, **low-frequency noise and infrasound remain a material component of the Commission's assessment of operational noise and residential amenity**.



Response 38 – Cumulative Operational Noise

Applicant's Response

Further Information Document FI-2, Appendix 3 – AWN Consulting Response, Section 2.6 – Operational Noise / Cumulative Noise Assessment, including the response concerning downwind and cumulative noise.

The Applicant, through **AWN Consulting Ltd**, responds to concerns raised by East Clare Environment Protection CLG regarding the cumulative operational noise effects of Knockshanvo when considered together with existing, permitted and proposed wind energy developments in the surrounding area.

AWN maintains that the cumulative noise assessment undertaken for the EIAR represents a **worst-case assessment** and appropriately accounts for the simultaneous contribution of the relevant wind farms.

The cumulative assessment considered a number of surrounding wind energy developments. Following acoustic screening, the wind farms carried forward into the detailed cumulative assessment include:

- **Oatfield Wind Farm;**
- **Carrownagowan Wind Farm;**
- **Lackareagh Wind Farm;**
- **Fahybeg Wind Farm;** and
- **Ballycar Wind Farm.**

The Applicant explains that other developments were screened according to their potential acoustic contribution using the methodology set out in the **Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97**.

AWN further states that the noise modelling assumes **downwind propagation from each turbine to each receptor simultaneously**. The Applicant relies upon this as a conservative assumption because, in reality, a receptor cannot normally be directly downwind of geographically dispersed wind farms in different directions at the same time.



Accordingly, the Applicant maintains that the cumulative predictions represent a robust worst-case scenario.

The Applicant concludes that the predicted cumulative operational noise levels remain within the applicable noise criteria at the assessed noise-sensitive locations and that **no significant cumulative operational noise effect is predicted**.

Issue

Whether the Applicant has demonstrated that the cumulative operational noise effects of Knockshanvo, when combined with Oatfield and the other relevant existing, permitted and proposed wind farms, will remain acceptable at surrounding noise-sensitive receptors, particularly having regard to the very quiet measured background environment and the concentration of wind energy development within the East Clare uplands.

CLG Assessment

The cumulative operational noise assessment is one of the most important components of the Applicant's noise case.

The CLG accepts that the Applicant has undertaken a specific cumulative assessment and has not assessed Knockshanvo in isolation.

It also accepts that modelling simultaneous downwind propagation from multiple wind farms towards an individual receptor represents a conservative acoustic modelling assumption.

However, the Applicant's conclusion again depends substantially upon demonstrating compliance with the applicable numerical noise criteria.

The wider planning issue is whether that compliance adequately characterises the cumulative change which would occur within the existing rural acoustic environment.

Oatfield is particularly important to the cumulative assessment

The proposed Oatfield Wind Farm is not a remote development making a marginal contribution to the Knockshanvo cumulative assessment.



It comprises **11 proposed turbines approximately 500 m from the Knockshanvo development** and occupies substantially the same East Clare upland landscape.

The combined development scenario could therefore involve approximately **20 large wind turbines** operating within this immediate area.

For residents situated around the two developments, the distinction between an “Oatfield” turbine and a “Knockshanvo” turbine is acoustically irrelevant.

The relevant environmental effect is the **total turbine noise experienced at the receptor**.

The Commission must therefore determine Knockshanvo on the basis of the cumulative environment that could arise if both developments proceed, rather than assessing the acceptability of Knockshanvo principally by reference to its individual acoustic contribution.

The Applicant's simultaneous downwind assumption is conservative

The CLG acknowledges the Applicant's point concerning meteorological assumptions.

Noise propagation from a wind turbine is generally enhanced under downwind conditions. Modelling each relevant wind farm as though the receptor were simultaneously downwind from all contributing turbines will, where the developments lie in different directions, represent a conservative scenario that may not physically occur under a single wind direction.

This aspect of the methodology therefore provides an appropriate degree of conservatism.

The CLG does not dispute it.

However, the conservatism of the propagation assumption does not resolve the separate issue of the **criterion against which the resulting cumulative prediction is judged**.

A conservative prediction can still represent a substantial alteration to the existing acoustic environment while remaining below the adopted numerical limit.



The measured baseline demonstrates the significance of the environmental change

As addressed under **RR-35 – Background Noise Methodology**, the Applicant's own monitoring demonstrates that the existing environment is particularly quiet.

At several monitoring locations, derived night-time background levels at lower wind speeds are approximately **20–25 dB LA90,10min**.

The cumulative noise assessment predicts substantially higher turbine-noise levels at a number of receptors.

This does not automatically mean that the development is acoustically unacceptable.

However, it demonstrates why the Commission should consider two distinct matters:

1. **compliance with the applicable cumulative noise criterion; and**
2. **the magnitude and character of the change from the existing acoustic environment.**

The Applicant's response focuses principally upon the first.

Environmental impact assessment requires consideration of the second as well.

The planning record itself recognises that substantial increases above background can remain compliant

This distinction is supported by the observations of the **National Environmental Health Service** contained elsewhere in the planning record.

As addressed under RR-35, the Environmental Health Service observed that application of the existing Wind Energy Development Guidelines can permit predicted turbine noise representing an increase of up to approximately **15 dB(A)** above the existing noise environment while still remaining within the applicable criteria.

This is particularly relevant to cumulative noise.

A conclusion that the combined Knockshanvo, Oatfield and other wind farm noise remains numerically compliant does not therefore establish that the cumulative development would produce only a negligible change in the existing environment.



The Commission should assess the actual predicted increase and the sensitivity of the affected receptors.

Cumulative compliance should be demonstrated at the receptor level

The relevant cumulative test must apply to the **total predicted noise from all contributing wind farms**.

This is important because the applicable criterion represents the overall acceptable turbine-noise environment at a receptor; it is not an individual allowance available separately to each wind farm.

The Applicant's cumulative modelling appears to recognise this principle.

The Commission should nevertheless ensure that any operational limits or planning conditions reflect it.

If permission were granted, it would not be sufficient simply to require Knockshanvo to comply with a limit without establishing how compliance is to be determined where other wind farms are simultaneously contributing to the measured noise level.

This issue becomes particularly significant if Oatfield becomes operational.

Enforcement of cumulative limits presents a practical difficulty

Cumulative assessment at planning stage and cumulative enforcement after construction are different matters.

The Applicant can model the combined contribution of Knockshanvo, Oatfield and other developments.

However, if a resident subsequently experiences turbine noise approaching or exceeding the applicable limit, determining which development is responsible may be considerably more difficult.

This creates an important enforcement issue.

A conventional compliance measurement at a dwelling may identify the **total wind turbine noise**, but it may not readily distinguish the contribution from individual wind farms where several developments are audible simultaneously.



Accordingly, if the Commission is minded to grant permission, the operational noise conditions should establish a clear and workable procedure for:

- complaint investigation;
- measurement of cumulative turbine noise;
- identification of the contribution attributable to Knockshanvo;
- coordination where another wind farm contributes materially to the measured level; and
- implementation of operational mitigation where the applicable cumulative limit is exceeded.

Without such a mechanism, a cumulative limit may be difficult to enforce effectively.

Headroom within the cumulative criterion is material

The Commission should also consider the extent of **acoustic headroom** remaining between the Applicant's predicted cumulative levels and the applicable criteria.

Where predicted cumulative levels approach the relevant limit closely, relatively small differences between predicted and actual turbine performance, atmospheric propagation or operating conditions may become material.

This does not mean that modelling uncertainty should automatically be added arithmetically to the prediction.

However, the Commission should examine whether the cumulative assessment demonstrates a comfortable margin of compliance or whether compliance at particular receptors depends upon relatively limited headroom.

This is particularly relevant in a development landscape containing several wind farms whose final operating characteristics may differ from assumptions used in cumulative modelling.

Future changes in the status of surrounding projects must be reflected

The cumulative assessment includes projects at different stages of the planning and development process.

As identified elsewhere in the Further Information, the status of some surrounding wind farms has changed since preparation of the original EIAR, including developments progressing from proposed to permitted status.



The Commission must determine the application using the **current cumulative scenario**.

Accordingly, the cumulative noise assessment should reflect the latest available turbine layouts, turbine specifications and planning status for all relevant projects.

Where the precise turbine model for another permitted development has not yet been fixed, the cumulative assessment should use appropriately conservative sound-power assumptions.

Cumulative noise must be considered together with receptor sensitivity

The importance of cumulative operational noise is particularly evident at **Sunyata Buddhist Retreat Centre**, addressed under RR-36.

AWN predicts a worst-case cumulative level of approximately **38.5 dB LA90** at that receptor.

Although this is stated to comply with the applicable criterion, the Centre presently experiences a particularly quiet acoustic environment, and its established use depends materially upon tranquillity.

This demonstrates why cumulative numerical compliance cannot always provide the complete assessment of environmental significance.

The same principle applies, although to varying degrees, to rural residences throughout the surrounding uplands.

The cumulative assessment should not artificially separate related environmental effects

The concentration of wind energy development will potentially alter more than the acoustic environment.

Residents may simultaneously experience cumulative:

- turbine noise;
- landscape and visual effects;
- shadow flicker;
- aviation lighting where required; and



- construction and traffic effects during development.

Each environmental topic must of course be assessed according to its own technical methodology.

However, when considering **population, human health and residential amenity**, the Commission should remain conscious that residents experience the development as a whole rather than as separate EIA chapters.

The cumulative operational noise assessment is therefore an important component of the wider assessment of the consequences of concentrating multiple large wind energy developments within this rural landscape.

Amplitude Modulation

The cumulative assessment is principally expressed in terms of predicted overall **LA90,10min noise levels**. While this is consistent with the methodology applied by the Applicant, compliance with an overall A-weighted noise limit does not necessarily address all characteristics that may affect the subjective prominence or intrusiveness of wind turbine noise.

One such characteristic is **amplitude modulation (“AM”)**, whereby the level of aerodynamic turbine noise varies periodically over time, commonly perceived as a rhythmic “swish” or “thump”. Where enhanced AM occurs, the resulting noise may be more noticeable or intrusive than a relatively steady sound having the same overall A-weighted level. This is particularly relevant in the context of the very low existing night-time background levels identified at a number of locations surrounding Knockshanvo.

The Applicant's predicted cumulative noise levels therefore provide important information regarding overall noise exposure, but do not in themselves demonstrate how any material AM arising during operation would be investigated or controlled. This assumes greater importance in the cumulative Knockshanvo/Oatfield context, where multiple large turbines may operate simultaneously within the same receiving environment.

The CLG does not suggest that enhanced AM will necessarily occur or that a particular penalty should be imposed in advance without an appropriate evidential basis. However, the Commission should be satisfied that any permission contains a **clear and enforceable mechanism for investigating complaints where amplitude-modulated turbine noise is objectively identified and, where necessary, requiring appropriate operational mitigation or curtailment**. Compliance with an overall LA90 noise limit



should not prevent investigation of a materially intrusive noise characteristic that is not adequately represented by the overall level alone.

Practical enforceability of cumulative noise limits

The cumulative assessment is necessarily concerned with the **combined noise experienced at a receptor**, whereas any planning permission for Knockshanvo would regulate only the contribution from the Knockshanvo development. This creates a practical enforcement issue where Knockshanvo and Oatfield, together with other relevant wind farms, contribute simultaneously to the measured noise environment.

If a resident subsequently experiences noise at or above the applicable cumulative criterion, measurement of the total noise level at the dwelling will not, by itself, establish the contribution attributable to each individual wind farm. In those circumstances, effective enforcement may require the separate contribution of Knockshanvo to be identified while Oatfield and potentially other turbines are operating under the same meteorological conditions. The Applicant's demonstration of predicted cumulative compliance does not, in itself, explain how such attribution would be undertaken in practice if a complaint or apparent exceedance arises.

This is particularly important given the close proximity of Knockshanvo and Oatfield and the likelihood that both developments would contribute to the same acoustic environment at a number of receptors. The Commission should therefore be satisfied that any permission contains a **clear, technically workable and enforceable compliance mechanism** capable of distinguishing the Knockshanvo contribution from other wind farm noise and requiring investigation and corrective action where necessary. Without such a mechanism, there is a risk that residents could experience an unacceptable cumulative noise environment while responsibility for the measured level remains disputed between separate operators.

CLG Conclusion

The Applicant has undertaken a specific cumulative operational noise assessment incorporating **Oatfield, Carrownagowan, Lackareagh, Fahybeg and Ballycar** and applies conservative propagation assumptions, including simultaneous downwind conditions from the contributing turbines.



The CLG accepts that these aspects of the methodology provide an appropriate degree of conservatism and does not dispute the Applicant's use of a worst-case downwind modelling scenario.

However, the central issue is not resolved solely by demonstrating that the predicted cumulative levels remain within the adopted numerical criteria.

The Applicant's own background survey demonstrates a **very quiet existing rural acoustic environment**, particularly at night. The predicted cumulative turbine-noise environment would therefore represent a substantial change from existing conditions at a number of receptors even where formal compliance is achieved.

This distinction is particularly important given the exceptionally close relationship between Knockshanvo and Oatfield. If both developments proceed, approximately **20 large turbines would operate within the same immediate upland landscape**, and surrounding residents would experience their combined acoustic effect rather than their separate planning identities.

The Commission should therefore examine not only whether each assessed receptor remains numerically compliant but also:

- the magnitude of the predicted increase above the measured background environment;
- the remaining acoustic headroom at the most exposed receptors;
- the sensitivity of particular receptors, including Sunyata;
- the currency and conservatism of assumptions concerning surrounding wind farms; and
- the practical enforceability of cumulative operational noise limits.

In particular, any permission should not rely upon a cumulative criterion that cannot subsequently be effectively monitored and enforced where several wind farms contribute to the measured noise environment.

Accordingly, the CLG submits that the Applicant has demonstrated that cumulative operational noise has been **modelled**, but numerical compliance alone does not establish that the resulting cumulative alteration of the East Clare acoustic environment is environmentally insignificant or acceptable.

Given the very low measured background levels, the concentration of existing, permitted and proposed wind energy development and the immediate relationship between Knockshanvo and Oatfield, **cumulative operational noise remains a critical consideration for the Commission in determining the proposed development.**



Finally, the CLG further submits that predicted cumulative compliance must be accompanied by a practicable enforcement mechanism capable of identifying the contribution of Knockshanvo where more than one wind farm contributes to the measured noise environment; otherwise, numerical limits may prove difficult to enforce effectively in practice.

Response 39 – Aviation Consultations with AirNav Ireland

Applicant's Response

The Applicant relies upon its ongoing engagement with AirNav Ireland and meetings between AirNav and the Applicant's aviation consultants as evidence that the aviation issues associated with the proposed development are capable of resolution.

The Further Information refers to discussions concerning Instrument Flight Procedures, Woodcock Hill MSSR, radar mitigation, PBN and other potential technical and operational solutions.

The Applicant maintains that continued engagement with AirNav provides a pathway through which the outstanding aviation matters can be addressed.

CLG Assessment

The CLG accepts that substantial consultation has taken place and that continued engagement with AirNav is appropriate.

However, the existence of consultation does not demonstrate that agreement has been reached or that the substantive aviation constraints have been resolved.

This distinction is particularly important because the Applicant relies upon records of meetings when describing AirNav's position. In the related Oatfield Further Information process, AirNav expressly stated:



“The meeting minutes furnished in the RFI were not distributed for review or to be agreed with AirNav Ireland, prior to submission as part of the RFI process.”

Where meeting records have not been reviewed or agreed by AirNav, they should not be treated as authoritative statements of AirNav’s position. Greater weight should be attached to AirNav’s formal written correspondence and technical observations.

Those formal positions continue to identify material concerns, including radar deflection, shadowing and surveillance coverage. Most importantly, AirNav has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”

The Applicant has not demonstrated that AirNav has withdrawn or materially revised this position.

Continued consultation should therefore not be interpreted as acceptance of the development or evidence that a solution will necessarily be found.

There is an important distinction between using consultation to finalise the detailed implementation of an **agreed mitigation solution** and relying upon future consultation to determine **whether an acceptable solution exists at all**.

The present application remains in the latter position in relation to important aviation matters.

Specialist Aviation Response

The consultation history, status of meeting records and formal positions expressed by AirNav are examined in detail in Section 4 – **Specialist Aviation Response**, particularly:

- **Woodcock Hill MSSR;**
- **Proposed Radar Mitigation;**
- **Applicant’s Aviation Consultants and Evidential Reliability;** and
- **Proposed Planning Conditions and Deliverability.**

That specialist analysis should be read as an integral part of this response.



CLG Conclusion

The Applicant's engagement with AirNav is acknowledged, but **consultation is a process rather than a mitigation measure**.

The Commission should distinguish between the Applicant's or its consultants' interpretation of discussions and the formal written positions expressed by AirNav itself.

The CLG submits that the consultation history does not demonstrate that the aviation constraints have been resolved. Until consultation results in a clearly defined and accepted solution to the identified impacts, continued engagement cannot provide the certainty necessary to support permission.

The detailed basis for this conclusion is set out in Section 4 – **Specialist Aviation Response**.

Response 40 – Radar Technical Assessment

Applicant's Response

The Applicant relies upon additional specialist radar assessment, including modelling undertaken by TNO, to address concerns regarding the effects of the proposed development on the **Woodcock Hill Monopulse Secondary Surveillance Radar ("MSSR")**.

The additional assessment considers matters including:

- line of sight between Woodcock Hill and the proposed turbines;
- Off-Boresight Error ("OBE") / radar beam deflection;
- the extent of the affected radar sector;
- cumulative effects associated with the adjoining Oatfield development; and
- the availability of overlapping surveillance coverage.



The Applicant relies upon this analysis to support its position that the radar effects have been adequately characterised and are capable of management or mitigation.

CLG Assessment

The additional technical assessment is relevant, but it does not demonstrate that the Woodcock Hill radar issue has been resolved.

Importantly, the Applicant's own technical evidence confirms rather than eliminates material radar interaction. TNO identifies full line of sight between Woodcock Hill and the proposed turbines and predicts additional OBE / beam-deflection effects.

The assessment also identifies a further expansion of the affected radar sector when the adjoining Oatfield turbines are included. This reinforces the importance of assessing Knockshanvo within the realistic cumulative aviation environment.

The central distinction is therefore between **characterising a radar effect** and **demonstrating that the resulting effect is operationally acceptable**.

The additional modelling achieves the former. It does not establish the latter.

AirNav has provided real-world evidence of radar deflection within the Woodcock Hill environment and continues to identify concerns regarding deflection, shadowing, coverage gaps and degradation in probability of detection. AirNav has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”

The Applicant has not demonstrated that AirNav has withdrawn or materially revised that position.

The technical assessment should also not be interpreted as resolving all aspects of radar interference. The Specialist Aviation Response identifies that the TNO work principally addresses line of sight and OBE, whereas AirNav's concerns extend additionally to **shadowing, reflections and surveillance coverage**.

Similarly, reference to overlapping surveillance, including Tooman, does not itself establish that equivalent surveillance performance and resilience would remain available throughout all relevant airspace and operational circumstances.



Accordingly, additional modelling of the radar interaction does not substitute for evidence that the resulting surveillance configuration is acceptable to the operator of the affected safety-critical system.

Specialist Aviation Response

The radar technical evidence is examined in detail in Section 4 – **Specialist Aviation Response**, particularly:

- **Woodcock Hill MSSR;**
- **Proposed Radar Mitigation;** and
- **International Case Studies.**

Those sections address the TNO findings, OBE, AirNav's measured evidence, shadowing, reflections, cumulative effects with Oatfield and overlapping surveillance from Tooman.

That specialist analysis should be read as an integral part of this response.

CLG Conclusion

The additional radar assessment provides useful further information concerning the interaction between the proposed turbines and Woodcock Hill MSSR.

However, it confirms that material radar effects exist rather than demonstrating that those effects are operationally acceptable or have been successfully mitigated.

The CLG therefore submits that the technical assessment should not be treated as resolving the Woodcock Hill constraint. The relevant question is not simply whether the effect can be modelled, but whether the resulting surveillance performance remains safe and operationally acceptable and whether an effective mitigation solution has been accepted by AirNav.

On the evidence presently before the Commission, that has not been demonstrated.

The detailed basis for this conclusion is set out in Section 4 – **Specialist Aviation Response**



Response 41 – Radar Mitigation Proposals

Applicant's Response

The Applicant identifies a range of potential measures to mitigate the acknowledged effects of the proposed development on aviation radar infrastructure.

These include:

- modification or optimisation of existing radar systems;
- supplementary short-range or long-range MSSR;
- reliance upon overlapping surveillance coverage, including Tooman;
- Wide Area Multilateration (“WAM”) or other surveillance technologies; and
- potential modification or upgrade of the Shannon Primary Surveillance Radar.

The Applicant maintains that these options demonstrate that the identified radar effects are capable of mitigation.

CLG Assessment

The Further Information demonstrates that a number of **potential radar mitigation technologies exist**, but it does not demonstrate that an accepted and deliverable mitigation solution has been established for Knockshanvo.

This distinction is fundamental.

AirNav has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”

It has also identified concerns regarding turbine shadowing, coverage gaps within controlled airspace and degradation in probability of detection.

The Applicant has not demonstrated that AirNav has withdrawn or materially revised these positions.



The alternatives identified by the Applicant — including modification of Woodcock Hill, supplementary radar, reliance upon Tooman and alternative surveillance technologies — remain potential technical pathways. No single option has been demonstrated as:

- addressing all identified surveillance effects;
- capable of accommodating the cumulative Knockshanvo/Oatfield configuration;
- preserving the required surveillance performance and resilience;
- accepted by AirNav;
- capable of obtaining the necessary safety and regulatory approvals; and
- practically deliverable.

The same concern applies to the Shannon Primary Surveillance Radar. Possible modification or upgrade is discussed, but no final technical solution accepted by the relevant aviation bodies has been demonstrated.

The Applicant's willingness to fund or facilitate future radar mitigation does not establish that such mitigation can actually be delivered. Implementation would remain dependent upon AirNav, regulatory approval and, depending upon the option selected, potentially new infrastructure, suitable land and other third-party arrangements.

The Commission should therefore distinguish between a **menu of possible technical options** and an **established mitigation solution**.

Detailed implementation of an established solution may appropriately be dealt with after permission. Determining after permission which solution might work, whether AirNav will accept it and whether it can obtain the necessary approvals is fundamentally different.

Specialist Aviation Response

The radar mitigation proposals are examined in detail in Section 4 – **Specialist Aviation Response**, particularly:

- **Woodcock Hill MSSR;**
- **Shannon Primary Surveillance Radar;**
- **Proposed Radar Mitigation;**
- **International Case Studies;** and
- **Proposed Planning Conditions and Deliverability.**



Those sections address supplementary radar, Tooman coverage, alternative surveillance technologies, Shannon PSR mitigation, cumulative effects with Oatfield and the practical and regulatory requirements for implementation.

That specialist analysis should be read as an integral part of this response.

CLG Conclusion

The Applicant has identified several technologies and infrastructure options which could potentially be investigated as radar mitigation.

It has not demonstrated a **specific, accepted and deliverable solution** which resolves the identified radar effects and preserves the required surveillance performance.

This is particularly significant given AirNav's continuing position that the radar-deflection issue cannot, in its opinion, be mitigated.

Accordingly, the CLG submits that the Commission should not treat a range of possible future radar interventions as equivalent to a demonstrated mitigation solution. The necessary radar mitigation remains unresolved and should not be deferred for determination after permission has been granted.

The detailed basis for this conclusion is set out in Section 4 – **Specialist Aviation Response**.

Response 42 – International Radar Case Studies

Applicant's Response

The Applicant relies upon a number of domestic and international examples to support its position that wind farm effects on aviation radar can be successfully mitigated.

The examples cited include experience at:



- Newcastle;
- Schiphol;
- Boolnaglegagh; and
- Australia,

together with other examples of wind energy development operating in proximity to aviation surveillance infrastructure.

The Applicant relies upon these case studies as evidence that radar interference associated with wind turbines is not an insurmountable constraint and that technical mitigation can be developed for Knockshanvo.

CLG Assessment

The case studies demonstrate that wind farm/radar conflicts can, in some circumstances, be addressed through technical, operational or development-specific measures.

However, they do not demonstrate that the effects identified at **Woodcock Hill and Shannon** can be successfully mitigated.

The relevance of any comparator depends upon the extent to which it reflects the circumstances of the proposed development, including:

- radar type and function;
- distance between turbines and radar;
- turbine height and number;
- terrain and line of sight;
- surveillance range and airspace function; and
- the nature of the mitigation actually implemented.

The examples relied upon by the Applicant differ materially from Knockshanvo in one or more of these respects.

This is particularly important because AirNav specifically sought evidence of an operational wind farm at a comparable distance from an **en-route MSSR performing a similar surveillance role to Woodcock Hill**, with turbines of comparable scale, demonstrating acceptable surveillance performance.

The case studies submitted do not provide a directly comparable operational example satisfying that request.



Some of the examples also demonstrate the opposite of the simple proposition that radar effects can always be accommodated. They show that successful outcomes may depend upon substantial radar intervention, operational changes, alterations to wind farm design or changes to the number or location of turbines.

Accordingly, the case studies establish that **site-specific solutions may sometimes be possible**. They do not establish that a solution exists for the particular Knockshanvo/Oatfield configuration.

The Commission should therefore assess the proposed development on the evidence relating to the actual affected systems — particularly Woodcock Hill MSSR and Shannon PSR — and the position of the bodies responsible for operating those systems.

Specialist Aviation Response

The individual case studies and their relevance to Knockshanvo are examined in detail in **International Case Studies** of the Specialist Aviation Response.

That section considers:

- Newcastle;
- Schiphol;
- Boolnaglegagh;
- the Australian examples;
- the mitigation actually employed in each case; and
- the extent to which each provides a valid comparator for the Woodcock Hill and Shannon radar environment.

The related technical and deliverability issues are also addressed in **Proposed Radar Mitigation** and **Proposed Planning Conditions and Deliverability**.

That specialist analysis should be read as an integral part of this response.

CLG Conclusion

The Applicant's case studies demonstrate that aviation/radar conflicts associated with wind energy development can sometimes be addressed.



They do **not** demonstrate that the specific effects of Knockshanvo, cumulatively with Oatfield, upon Woodcock Hill MSSR and Shannon's surveillance infrastructure can be successfully mitigated.

Most importantly, they do not provide the directly comparable operational evidence sought by AirNav.

The CLG therefore submits that the international and domestic case studies should not be relied upon as proof that an acceptable radar mitigation solution exists for Knockshanvo. The acceptability of this development must be determined by reference to its specific effects, the characteristics of the affected aviation systems and the position of the responsible aviation bodies.

The detailed assessment of the case studies is set out in Section 4 – **Specialist Aviation Response**.

Response 43 – Overall Aviation Conclusions

Having considered the observations of AirNav Ireland, Shannon Airport Authority and other parties, together with the additional technical assessments submitted as Further Information, the Applicant concludes that aviation does not represent an insurmountable constraint to the proposed development.

The Applicant relies upon a combination of:

- future changes to Instrument Flight Procedures and PBN;
- radar technical assessment;
- potential radar mitigation measures;
- domestic and international case studies;
- continued engagement with AirNav and other aviation bodies; and
- proposed planning conditions.

On this basis, the Applicant maintains that the identified aviation effects can be satisfactorily addressed and that permission can be granted subject to appropriate mitigation and conditions.



CLG Assessment

The CLG does not agree that the Further Information establishes this conclusion.

The additional material provides substantially more information about the aviation interactions associated with the proposed development. However, **additional assessment of an impact is not the same as resolution of that impact.**

The evidence confirms continuing interaction with safety-critical aviation systems and procedures, including:

- Instrument Flight Procedures and the ATCSMAC;
- Woodcock Hill MSSR;
- Shannon Primary Surveillance Radar; and
- associated navigation and surveillance infrastructure.

The Applicant identifies potential pathways by which these effects might be addressed, but important elements remain dependent upon future procedure redesign, PBN implementation, radar modification or supplementary infrastructure, safety and regulatory approval, and agreement with independent aviation bodies.

Most significantly, AirNav has stated:

“The issue of radar deflections cannot be mitigated in our opinion.”

AirNav has also identified turbine shadowing, coverage gaps within controlled airspace and degradation in probability of detection. The Applicant has not demonstrated that these formal concerns have been withdrawn or that AirNav has accepted a specific alternative solution.

The Applicant's case therefore remains dependent to a material extent upon **future resolution of identified aviation constraints**, rather than upon mitigation which has already been demonstrated to be technically feasible, operationally acceptable and deliverable.

This distinction is particularly important because the affected systems perform safety-critical functions and because the final acceptance of any solution is not within the Applicant's unilateral control.

The cumulative relationship with Oatfield must also be considered. The realistic aviation environment may involve approximately 20 turbines across Knockshanvo and Oatfield,



and the Applicant's own technical evidence identifies increased radar effects when the adjoining development is included.

Specialist Aviation Response

Because the aviation issues are technically interconnected, the CLG has consolidated its detailed assessment in Section 4 – **Specialist Aviation Response**.

That specialist report addresses:

- **A. Executive Summary**
- **B. Aviation Safeguarding History**
- **C. Instrument Flight Procedures and ATCSMAC**
- **D. Navaid Flight Calibration**
- **E. Woodcock Hill MSSR**
- **F. Shannon Primary Surveillance Radar**
- **G. Proposed Radar Mitigation**
- **H. International Case Studies**
- **I. Applicant's Aviation Consultants and Evidential Reliability**
- **J. Proposed Planning Conditions and Deliverability**
- **K. Climate Policy Does Not Override Aviation Safety**
- **L. Overall Aviation Conclusion**

That report should be read as an integral part of this response and contains the detailed technical and evidential basis for the CLG's aviation conclusions.

CLG Conclusion

The Further Information demonstrates that the Applicant has undertaken substantial additional aviation assessment and has identified a range of potential technical and procedural responses.

However, the central aviation question remains unresolved.

The Applicant has **not demonstrated a complete aviation solution which is presently operationally acceptable, regulatorily approvable and practically deliverable**, particularly in relation to the Woodcock Hill surveillance constraint.



The Commission should not equate the existence of possible future mitigation options, continued consultation or proposed planning conditions with evidence that the underlying aviation constraints have been resolved.

Where permission depends upon future changes to safety-critical aviation systems or procedures, the fundamental feasibility and acceptability of those changes should be established before permission is granted, rather than left to be determined afterwards.

Accordingly, for the reasons set out in the Specialist Aviation Response, the CLG submits that the aviation effects remain unresolved and constitute a substantial and independent basis for refusal of permission.

The detailed evidential and technical basis for this conclusion is set out in Section 4 – **Specialist Aviation Response**.

Response 44 – Landowner Consent / Legal Interest

Applicant's Response

Further Information Document FI-1, Section 3.1.14 – Landowner Consent, pp. 57–58.

The Applicant responds to observations questioning whether it has sufficient legal interest in the lands required for the proposed development and whether the necessary landowner consents have been obtained.

The Applicant's position is that it has sufficient legal interest and the necessary landowner consent to make the planning application and to implement the proposed development. It therefore rejects the suggestion that uncertainty regarding land ownership or consent represents an impediment to the grant or implementation of permission.



Issue

Whether the Applicant has demonstrated sufficient legal interest and control over all lands and infrastructure necessary not only to make the planning application, but also to implement the development and all material mitigation, compensation and enhancement measures upon which the environmental acceptability of the proposed development depends.

The issue is particularly important where implementation requires access to or control over third-party lands or infrastructure, or the agreement and cooperation of parties other than the Applicant.

CLG Assessment

The CLG considers that an important distinction must be maintained between:

- sufficient legal interest or landowner consent to **make a planning application;** and
- sufficient legal and practical control to **implement the development and the mitigation upon which permission depends.**

The CLG does not suggest that An Coimisiún Pleanála is required to adjudicate upon private property disputes or determine competing ownership claims.

The planning issue is narrower and more important to the determination of this application:

Has sufficient evidence been provided to demonstrate, with reasonable certainty, that the development and all material mitigation, compensation and enhancement measures relied upon in the EIAR, NIS and Further Information are capable of being implemented?

A general assertion that sufficient legal interest exists does not, in itself, answer that question.



Legal control over essential mitigation is part of the question of deliverability

The environmental conclusions supporting the application depend upon more than the Applicant's ability to construct turbine foundations, access roads, hardstands and other physical wind farm infrastructure.

The EIAR, NIS and Further Information rely upon a range of mitigation, compensation, enhancement, monitoring and land-management measures to avoid, reduce or compensate for identified environmental effects.

Where such a measure is relied upon in reaching a conclusion that a significant environmental effect will be avoided, reduced or compensated, its **deliverability is material to the environmental assessment**.

The Commission must therefore be satisfied not simply that the proposed measure is technically or ecologically appropriate, but that there is a sufficiently certain legal and practical mechanism by which it can actually be implemented and maintained for the period necessary to achieve its stated function.

A future intention to obtain whatever rights may subsequently prove necessary does not provide the same degree of certainty as a demonstrated and credible implementation mechanism at the decision-making stage.

Habitat compensation and enhancement lands

This issue is particularly relevant to the Applicant's proposed habitat compensation and enhancement measures.

As addressed elsewhere in this submission, the Applicant relies upon the **Hen Harrier Enhancement and Compensation Plan**, habitat restoration and management, ecological monitoring and associated long-term land-management measures in support of its conclusions concerning habitat loss, forestry effects, displacement and effects upon Hen Harrier.

These measures are not merely desirable additions to the project.

To the extent that they are relied upon to avoid, reduce or compensate for environmental effects, they form part of the basis upon which the Applicant asks the Commission to conclude that the proposed development is environmentally acceptable.



The Commission must therefore be satisfied not only as to the ecological adequacy of the proposed compensation and enhancement lands, but also as to their **legal and practical deliverability**.

This includes sufficient certainty that the Applicant can:

- obtain the necessary access;
- undertake the proposed habitat works;
- control or secure the required land management;
- undertake monitoring;
- maintain the measures for the required duration; and
- prevent incompatible land-management activities where these would undermine the intended ecological function.

A planning condition can regulate the manner in which mitigation is implemented. It cannot, by itself, create property rights or third-party consents which do not otherwise exist.

Landowner consent, legal interest and effective control are not necessarily the same thing

The Commission should also distinguish between **landowner consent, legal interest and effective control**.

Consent from a landowner to make a planning application does not necessarily demonstrate that the Applicant possesses every right required subsequently to undertake construction, permanently manage habitat, carry out ecological compensation or maintain mitigation for decades.

This becomes particularly relevant where land may be affected by:

- multiple ownership interests;
- commonage interests;
- leases or occupational interests;
- rights held by persons other than the registered owner; or
- other legal interests capable of affecting implementation.

Submissions before the Commission have raised questions regarding the Applicant's demonstrated legal interest and landowner consent in respect of a number of folios within the application boundary.



The CLG does not ask the Commission to determine the underlying private legal rights.

However, where any such land is necessary for the development or for mitigation upon which the environmental assessment depends, the Commission must be satisfied that uncertainty regarding those rights does not undermine the **practical deliverability of the proposal**.

The significance of the issue depends upon the importance of the mitigation

Not every uncertainty concerning land has the same planning significance.

Where a proposed measure is supplementary or desirable but not required to support an environmental conclusion, uncertainty regarding its implementation may be of relatively limited importance.

The position is materially different where mitigation or compensation is relied upon to support a conclusion that a potentially significant effect will be avoided or adequately compensated.

In those circumstances, implementation cannot simply be assumed.

The greater the importance of the mitigation to the environmental conclusion, the greater the need for certainty that it can actually be delivered.

A related but distinct issue arises in relation to aviation mitigation

The issue of legal and practical deliverability also arises, in a related but distinct form, in relation to the Applicant's aviation mitigation proposals.

As addressed in Responses 40–43 of this submission, the Applicant's Further Information identifies potential mitigation pathways involving aviation procedures, Woodcock Hill MSSR and/or other surveillance infrastructure and continuing engagement with AirNav Ireland, Shannon Airport and relevant third parties.

Some of those potential mitigation pathways cannot be implemented unilaterally by the Applicant.



They may require third-party agreement, technical implementation by infrastructure operators, regulatory approval and, depending upon the final solution, access to or works upon infrastructure or lands outside the Applicant's direct control.

The relevant distinction is therefore between:

- **the Applicant's willingness to fund or implement a mitigation solution, and**
- **the Applicant's demonstrated ability to secure and deliver that solution.**

A commitment to fund or contribute financially towards works does not, by itself, establish the legal rights, third-party agreement or regulatory approval necessary to implement them.

This issue is particularly significant because aviation mitigation is not peripheral. It concerns a safety-critical constraint identified in relation to the proposed development.

Relevance of the Ballycar Wind Farm decision

The recent Ballycar Wind Farm decision is relevant to this question of deliverability.

In that case, the Commission's reason for refusal included the finding that, because aviation mitigation measures were required, it was not satisfied that the applicant had:

“sufficient legal interest, or can acquire such interest to implement such mitigation measures”

on lands which had not been identified within the application site boundary, the applicant's landholding or otherwise demonstrated as being within its control through appropriate landowner consent.

The CLG recognises that Ballycar concerns a separate development and that Knockshanvo must be determined on the evidence and circumstances of this application.

The relevance of Ballycar is therefore not that the same outcome must automatically follow.

Rather, it demonstrates the importance of the underlying planning question:

where the environmental or technical acceptability of a development depends upon mitigation requiring third-party lands, infrastructure or cooperation, the



Commission must be satisfied that there is a sufficiently certain and credible pathway by which that mitigation can actually be implemented.

This is directly relevant to Knockshanvo where the Applicant asks the Commission to rely upon mitigation measures that may depend upon parties or infrastructure outside its unilateral control.

Essential mitigation should not simply be deferred to post-consent agreement

The Applicant may argue that outstanding implementation matters can be secured by planning condition or resolved following the grant of permission.

There is an important distinction, however, between:

- using a condition to regulate the detailed implementation of a mitigation measure whose deliverability has already been established; and
- using a condition to defer the question of whether the Applicant will actually be able to secure the rights, third-party cooperation or infrastructure necessary for that mitigation to occur.

The first may be an appropriate use of a planning condition.

The second presents a materially different issue where the mitigation is fundamental to the conclusion that the development is environmentally or technically acceptable.

A planning condition cannot itself confer rights over third-party land, compel an infrastructure operator to alter its equipment or guarantee regulatory approval of a future technical solution.

Accordingly, where essential mitigation depends upon such matters, sufficient certainty regarding the implementation pathway should exist **before the Commission relies upon that mitigation in determining the application.**

The Commission does not need to resolve every private property issue

The CLG is not suggesting that every property right associated with a large infrastructure project must be finally adjudicated or perfected before planning permission can ever be granted.



Nor is it suggested that planning permission itself confers property rights.

The point is narrower.

There is an important distinction between:

- **a private property matter affecting whether a developer ultimately chooses or is able to exercise a planning permission, and**
- **an absence of demonstrated control, agreement or implementation capability concerning land or infrastructure required for mitigation upon which the Commission itself relies in concluding that the development is acceptable.**

The latter is directly relevant to the planning and environmental assessment.

The question for the Commission is therefore not whether every private landownership issue has been conclusively determined.

It is whether the evidence before it provides **sufficient certainty that the measures necessary to make the proposed development environmentally and technically acceptable are actually deliverable.**

CLG Conclusion

The Applicant states that it has sufficient legal interest and landowner consent to make and implement the proposed development.

That assertion does not, however, resolve the wider issue.

The Commission must be satisfied that there is sufficient legal and practical control, or another sufficiently secure and credible implementation mechanism, for all material elements upon which the environmental and technical acceptability of the development depends.

This is particularly important in relation to:

- habitat compensation and enhancement lands;
- long-term ecological management and monitoring obligations;
- mitigation requiring access to or management of third-party lands; and



- aviation mitigation involving third-party infrastructure, agreement or regulatory approval.

Where such measures are relied upon to avoid, reduce or compensate for material environmental effects, their implementation cannot simply be assumed or left dependent upon uncertain future arrangements.

The Ballycar decision is particularly relevant in demonstrating that uncertainty regarding legal interest and the ability to implement essential mitigation may constitute a planning issue rather than merely a private property matter.

The CLG therefore submits that the Applicant's general assertion of sufficient legal interest does **not, of itself, demonstrate the deliverability of all mitigation upon which the Knockshanvo assessment relies.**

Before permission could be granted, the Commission should be satisfied on the evidence before it that all lands, infrastructure, third-party agreements and implementation mechanisms necessary for material mitigation, compensation and enhancement measures are sufficiently secure and capable of being maintained for the required duration.

Where that certainty has not been demonstrated, the Commission should not rely upon the relevant mitigation in reaching its environmental or planning conclusions, nor should the matter simply be deferred to post-consent agreement or treated as a private landownership issue.

Response 45 – Ornithological Survey Adequacy and Collision Risk Modelling

Applicant's Response

Further Information Response to Observations (FI-1), Sections 3.1.7.1, 3.1.7.2, 3.1.7.3 and 3.1.7.5 – Ornithology, pp. 36–37.

The Applicant responds to observations concerning the adequacy of the ornithological assessment under four principal headings:



- Adequacy of Survey Methods;
- Adequacy of Vantage Point Coverage;
- Aviation Lighting; and
- Snipe and Woodcock.

Bird displacement is addressed separately in **Response 08** of this submission, while Hen Harrier-specific collision risk is addressed in **Response 22**.

The Applicant states that ornithological surveys were undertaken between 2018 and 2023 in accordance with NatureScot guidance, comprising five winter seasons and six breeding seasons, and maintains that this represents a robust survey effort exceeding normal minimum requirements.

The Applicant acknowledges that commercial forestry and topography restricted visibility from some vantage points. An additional vantage point, VP6, was introduced following refinement of the turbine layout. The Applicant maintains that the Band Collision Risk Model (“CRM”) can accommodate gaps in viewshed coverage and that significant differences in bird distribution within areas of restricted visibility are unlikely given the predominance of commercial forestry.

The Applicant's Collision Risk Assessment identifies seven Key Ornithological Receptors recorded at potential collision height: **Hen Harrier, Peregrine, Kestrel, Snipe, Woodcock, Buzzard and Sparrowhawk**, with collision-risk calculations undertaken for each.

The Applicant also modelled three turbine-envelope scenarios covering the potential dimensional range of the proposed turbines and adopted the highest predicted collision risk for each species.

In relation to Snipe and Woodcock, dedicated surveys were undertaken, including dusk surveys for Woodcock, and precautionary assumptions regarding nocturnal activity were incorporated into the collision-risk calculations.

The Applicant concludes that the ornithological survey programme and collision-risk assessment provide a sufficiently robust basis for determining the likely effects of the proposed development.

Issue

Whether the ornithological baseline and collision-risk assessment, considered together with the Further Information, adequately address the acknowledged limitations in



vantage-point visibility, the uncertainty associated with crepuscular and nocturnal bird activity, aviation lighting and the cumulative collision environment associated with Knockshanvo and Oatfield, such that the predicted significance of effects on relevant bird populations can be relied upon.

CLG Assessment

The CLG acknowledges the substantial duration of the Applicant's ornithological survey programme.

Five winter seasons and six breeding seasons represent a considerable body of survey effort, and the CLG does not contend that the assessment is inadequate merely because additional survey work could theoretically have been undertaken.

Similarly, the CLG acknowledges that the Applicant has undertaken collision-risk modelling for seven identified Key Ornithological Receptors and has modelled three potential turbine-envelope scenarios, adopting the highest predicted collision risk for each species.

The outstanding concern is therefore more specific: **whether the underlying flight-activity information and assumptions are sufficiently representative to support the collision-risk predictions, particularly where the Applicant itself identifies limitations in visibility and nocturnal activity.**

Vantage-point coverage was not complete

The Applicant's Collision Risk Assessment expressly acknowledges the difficulty in obtaining full visibility of the proposed turbine layout because of the site's topography and commercial forestry.

In particular, the Applicant records that **T4 was not covered by a vantage-point survey at the lowest swept height** and that, prior to the introduction of VP6, **T7 was also not covered** at that height.

The Applicant's recognition of these limitations is important.

The Applicant maintains that the Band CRM can account for gaps in viewshed coverage and that significant differences in avian distribution within those gaps are unlikely because the relevant landscape consists predominantly of commercial forestry.



The CLG does not suggest that incomplete visibility automatically invalidates the assessment. However, the proposition that broadly similar habitat necessarily supports broadly similar flight activity requires caution.

Bird movements may be influenced by more than broad habitat classification. They can also respond to:

- forestry edges and openings;
- variations in forestry age and structure;
- topography and ridgelines;
- localised feeding opportunities;
- nesting and roosting locations; and
- commuting routes between habitat areas.

Accordingly, the fact that an unseen area is also predominantly commercial forestry does not, by itself, demonstrate that flight activity within it is equivalent to that observed elsewhere.

The introduction of VP6 improved survey coverage and is acknowledged. However, the relevant question remains whether the total dataset adequately characterises flight activity across all areas intersecting the turbine rotor-swept zone.

Walkover surveys do not perform the same function as vantage-point surveys

The Applicant also refers to walkover surveys as supplementary evidence supporting its understanding of bird activity across the site.

Such surveys provide valuable information regarding species presence, breeding activity and habitat use.

However, they do not perform precisely the same function as vantage-point observations undertaken for collision-risk modelling.

Collision-risk calculations depend materially upon information concerning the **frequency, duration and height of flights through the rotor-swept area.**

Accordingly, walkover records can supplement the ornithological baseline but cannot necessarily substitute for flight-activity observations in areas where vantage-point visibility is restricted.



The Commission should therefore be satisfied that the Applicant's treatment of viewshed gaps does not introduce material uncertainty into the collision-risk calculations for the affected turbine locations.

The turbine-envelope assessment is appropriately precautionary, but remains dependent upon the baseline data

The CLG acknowledges that the Applicant has not simply modelled a single assumed turbine configuration.

Three turbine-envelope scenarios were assessed, representing the range of potential rotor-swept heights, and the highest predicted collision-risk result for each species was carried forward.

That represents a precautionary element of the assessment and should be acknowledged.

However, modelling a conservative turbine envelope does not resolve uncertainty in the **flight-activity dataset entered into the model**.

The reliability of the resulting collision prediction remains dependent upon the reliability and representativeness of the underlying observations concerning flight frequency, height and spatial distribution.

The principal CLG concern therefore relates not to the mathematical modelling of turbine dimensions, but to whether the observational dataset adequately captures bird activity within the rotor-swept environment.

Snipe – the Applicant itself acknowledges potential underestimation

The assessment of Snipe deserves particular attention.

The Applicant's Collision Risk Assessment expressly acknowledges that:

“the predicted number of transits, and hence predicted rate of collision, for snipe may be largely underestimated”

because Snipe flight activity is substantially crepuscular whereas the vantage-point surveys were predominantly undertaken during daylight hours.

This is a significant qualification to the underlying collision-risk prediction.



The Applicant seeks to address this uncertainty by applying the precautionary assumption that Snipe and Woodcock may be active for **25% of the night in addition to daylight hours**, based upon the relevant guidance.

The use of a precautionary nocturnal activity assumption is acknowledged.

However, where the Applicant itself accepts that observed Snipe transits may be **“largely underestimated”**, the Commission should be satisfied that the assumed 25% nocturnal activity allowance provides an adequately conservative representation of actual activity at Knockshanvo.

In particular, it should be clear how sensitive the predicted collision mortality is to that assumption and whether materially greater nocturnal activity would alter the significance of the predicted effect.

Woodcock and nocturnal activity

The Applicant undertook dedicated Woodcock surveys, including dusk surveys, and this represents an appropriate species-specific response.

Nevertheless, Woodcock, like Snipe, exhibits substantial crepuscular and nocturnal activity.

The ordinary daytime vantage-point dataset will therefore inevitably provide a less complete picture of flight activity for these species than for predominantly diurnal species.

The issue is not that nocturnal activity was ignored; the Applicant has expressly attempted to account for it.

Rather, the Commission should be satisfied that the assumptions used to extrapolate nocturnal activity are sufficiently conservative and supported to ensure that collision risk has not been materially underestimated.

Aviation lighting should not be considered solely in relation to Hen Harrier

The Applicant's response concerning aviation lighting is framed principally by reference to Hen Harrier.



It notes that Hen Harrier is predominantly diurnal, generally flies at relatively low heights while hunting and has limited temporal overlap with turbine aviation lighting.

That reasoning is relevant to Hen Harrier.

However, it does not necessarily address species such as **Snipe and Woodcock**, whose activity extends substantially into dusk, darkness and dawn.

The CLG does not assert that aviation lighting will necessarily result in a significant effect on these species.

Rather, given the acknowledged crepuscular/nocturnal activity of species recorded at the site, the Commission should be satisfied that required aviation lighting does not introduce a material behavioural or collision-risk effect that is not adequately represented within the existing assessment.

This should also be considered cumulatively where aviation lighting would be associated with multiple large wind turbines within the same wider upland landscape.

Cumulative collision risk should reflect the combined Knockshanvo/Oatfield landscape

The cumulative context is particularly important.

Knockshanvo proposes **nine turbines**. If the proposed Oatfield Wind Farm also proceeds, the same wider upland landscape would contain a combined **20 turbines** associated with the two developments.

For mobile bird species using the Knockshanvo/Oatfield uplands, those developments do not represent separate ecological environments merely because they are subject to separate planning applications.

Birds may move across and between both development areas while foraging, commuting, breeding or dispersing.

The relevant question is therefore not simply the predicted collision mortality associated with the nine Knockshanvo turbines considered in isolation, but whether the **combined collision risk across the wider 20-turbine landscape** has been adequately assessed at the relevant population scale.



This is particularly important for species recorded using both development areas and for species whose movements extend across substantial areas of the East Clare uplands.

The CLG does not suggest that collision probabilities from separate projects can simply be added without regard to species ecology, flight behaviour and population characteristics.

Rather, the cumulative assessment should transparently demonstrate how predicted mortality associated with Knockshanvo has been considered alongside mortality and displacement associated with Oatfield and other relevant wind-energy development and whether the resulting cumulative effect could be significant for the relevant population.

This cumulative issue also interacts with the displacement concerns addressed separately in **Response 08**. Collision mortality and displacement are different effects, but both can act upon the same bird population and therefore require consideration within the overall cumulative assessment.

Post-construction monitoring does not resolve uncertainty in the pre-consent assessment

The Applicant proposes post-construction monitoring, including carcass searches and other ornithological monitoring.

The CLG supports appropriate post-construction monitoring.

Such monitoring can test predictions, identify unexpected effects and inform operational management.

However, post-construction monitoring cannot substitute for an adequate pre-consent assessment of likely significant effects.

In particular, monitoring undertaken after turbines become operational cannot retrospectively resolve material uncertainty in the flight-activity dataset or collision-risk calculations relied upon when deciding whether permission should be granted.

The relevant collision-risk assessment must therefore be sufficiently robust at the decision-making stage, with post-construction monitoring serving to verify predictions rather than establish for the first time whether those predictions were reliable.



CLG Conclusion

The Applicant has undertaken an extensive ornithological survey programme and has provided a substantial collision-risk assessment. The CLG acknowledges in particular that:

- surveys extended across multiple breeding and winter seasons;
- seven Key Ornithological Receptors were subject to collision-risk modelling;
- the Applicant modelled three potential turbine-envelope scenarios and adopted the highest predicted collision risk for each species;
- an additional vantage point, VP6, was introduced to improve coverage; and
- species-specific measures were taken to address Snipe and Woodcock activity.

The CLG's concern is therefore not that the Applicant failed to undertake ornithological assessment.

It is that **material uncertainties expressly identified within the Applicant's own assessment remain relevant to the reliability of its conclusions.**

In particular:

- vantage-point visibility was incomplete at parts of the proposed turbine layout;
- the assumption that broadly similar forestry habitat implies no significant difference in flight activity within viewshed gaps requires caution;
- walkover surveys cannot fully substitute for flight-activity observations required for collision-risk modelling;
- the Applicant expressly acknowledges that Snipe transits, and therefore predicted collision risk, **may be largely underestimated** because of the predominantly daytime nature of vantage-point surveys;
- the reliability of the assumed nocturnal activity allowance for Snipe and Woodcock therefore remains important;
- the aviation-lighting response is principally Hen Harrier-specific despite the presence of crepuscular and nocturnal species; and
- the cumulative assessment must address bird use of a wider landscape potentially containing **20 Knockshanvo/Oatfield turbines**, rather than considering collision risk solely within the individual Knockshanvo planning boundary.

The CLG therefore submits that the Commission should scrutinise the acknowledged limitations and assumptions within the ornithological assessment before relying upon the predicted collision effects.



In particular, the Commission should be satisfied that the underlying flight-activity dataset and treatment of nocturnal activity are sufficiently robust to support the collision-risk predictions and that cumulative mortality and displacement have been assessed at the **relevant bird-population and landscape scale**.

These matters remain material to the assessment of the proposed development and should be considered alongside the separate concerns regarding **bird displacement in Response 08 and Hen Harrier-specific collision risk in Response 22**.

Response 46 – Marsh Fritillary

Applicant's Response

Further Information Document FI-1, Section 3.1.6.3 – Impacts on Marsh Fritillary

The Applicant responds to observations concerning Marsh Fritillary by stating, in summary, that:

- records of Marsh Fritillary within the wider area were acknowledged in the EIAR;
- field surveys concluded that the proposed development footprint lies outside suitable Marsh Fritillary habitat;
- areas containing Devil's-bit Scabious adjacent to forestry tracks and peatland were identified during surveys and will not be affected by the proposed development;
- drainage associated with the proposed development will not affect adjacent peatland habitats because of the separation between infrastructure and those habitats and the presence of existing forestry drains;
- no significant loss of suitable Marsh Fritillary habitat or habitat connectivity will occur; and
- consequently, no specific mitigation measures are required.

The Applicant therefore maintains its conclusion that the proposed development will not result in significant effects on Marsh Fritillary.



Issue

Whether the Further Information adequately addresses the concerns raised regarding the identification and assessment of Marsh Fritillary habitat, including potential habitat connectivity, wet grassland associated with the grid connection route, indirect drainage effects, survey methodology and cumulative habitat fragmentation.

The relevant issue is not confined to whether proposed infrastructure directly overlaps a mapped area of suitable breeding habitat. It also concerns whether the assessment has adequately considered the ecological functioning and connectivity of suitable and potentially suitable habitat within the wider landscape.

CLG Assessment

The Applicant's response does not fully address the concern raised

The Applicant's response focuses substantially upon its conclusion that the proposed development footprint lies outside areas identified as suitable Marsh Fritillary habitat.

However, this does not fully address the concern raised in the original observations.

The issue identified was not simply whether a turbine foundation, road or other item of infrastructure directly overlaps an identified Marsh Fritillary breeding location. The concern extended to:

- whether all suitable and potentially suitable habitat had been correctly identified;
- the ecological connectivity between habitat patches;
- wet grassland and other potentially suitable habitat associated with the grid connection route;
- indirect hydrological effects;
- fragmentation of the wider habitat network; and
- whether the survey methodology was sufficient to support the conclusion reached.

The Further Information largely restates the Applicant's original conclusion without fully resolving these underlying matters.



Marsh Fritillary ecology requires consideration beyond the immediate development footprint

Marsh Fritillary populations are dependent upon networks of suitable habitat rather than simply isolated individual patches.

The species can occur as a metapopulation, with the continued functioning of local populations influenced by the availability, quality and connectivity of suitable habitat across the surrounding landscape.

This is important because habitat may contribute to the ecological functioning of a Marsh Fritillary population even where a particular patch is not occupied during an individual survey.

Accordingly, establishing that infrastructure does not directly overlap habitat identified as suitable at the time of survey does not, by itself, demonstrate that effects upon the species have been adequately excluded.

The assessment must also consider whether the development could:

- reduce the quality or extent of potentially suitable habitat;
- interfere with connectivity between suitable habitat patches;
- alter hydrological conditions supporting such habitat; or
- contribute to fragmentation when considered together with existing land uses and other development.

The Applicant's Further Information does not clearly demonstrate how these wider ecological considerations have been incorporated into its conclusion of no significant effect.

Devil's-bit Scabious and potential habitat connectivity

The Applicant acknowledges areas containing **Devil's-bit Scabious**, the principal larval food plant of Marsh Fritillary, including areas adjoining forestry tracks and peatland.

The Applicant states that these areas will not be affected by the proposed development.

However, the presence of Devil's-bit Scabious is relevant not simply because infrastructure may or may not directly remove individual plants.



The original concern relates to the wider distribution of potentially suitable habitat and the extent to which areas containing suitable vegetation may contribute to connectivity between habitat patches.

The CLG does not suggest that every occurrence of Devil's-bit Scabious constitutes occupied Marsh Fritillary breeding habitat or a proven movement corridor.

Rather, where potentially suitable habitat occurs within or adjoining the development area, the assessment should demonstrate how its ecological function and connectivity have been evaluated before concluding that fragmentation or loss of connectivity will not arise.

The Further Information does not clearly provide that analysis.

Wet grassland and the grid connection route

The original observations also raised a specific concern regarding wet grassland and potentially suitable habitat associated with the proposed grid connection route.

The concern was that potentially relevant habitat along this route had not been adequately incorporated into the Marsh Fritillary assessment.

This is particularly important where comparable ecological assessment associated with the adjoining Oatfield Wind Farm has identified wet grassland along the same or overlapping route.

If comparable habitat occurring along the same wider corridor has been identified differently between the two assessments, that discrepancy requires explanation.

The Further Information does not clearly demonstrate that the potentially suitable habitat along the full grid connection route has been systematically assessed for Marsh Fritillary or explain how potential connectivity along that route was considered.

The conclusion that no significant habitat or connectivity effects will occur is therefore not adequately supported simply by demonstrating that the principal wind farm infrastructure avoids habitat mapped as suitable.



Indirect drainage effects remain relevant

The Applicant also relies upon separation distances and existing forestry drainage in concluding that adjacent peatland habitat will not be adversely affected by drainage associated with the proposed development.

However, the concern raised by the CLG relates primarily to **indirect alteration of habitat conditions**, rather than direct physical encroachment.

The ecological suitability of Marsh Fritillary habitat can depend upon the maintenance of appropriate vegetation and hydrological conditions.

Consequently, the relevant question is not simply whether infrastructure physically enters an area of suitable habitat, but whether drainage, excavation, road construction or associated changes to surface-water and shallow groundwater behaviour could alter the conditions supporting habitat adjoining the works.

The existence of pre-existing forestry drains does not, of itself, demonstrate that additional drainage and construction works cannot produce further hydrological change.

The Further Information should therefore demonstrate the hydrological basis upon which potentially suitable adjoining habitat can be excluded from indirect effects.

The CLG does not consider that reliance upon separation distance and the existence of forestry drainage, without a clear receptor-specific analysis, fully resolves this concern.

Survey methodology remains material to the conclusion

The Applicant relies upon its field surveys in concluding that the development footprint lies outside suitable Marsh Fritillary habitat.

However, the original observations questioned the basis upon which suitable habitat was identified in the first place, including whether potentially suitable habitat and areas contributing to ecological connectivity had been sufficiently surveyed.

This distinction is important.

Where the concern relates to the **adequacy of the methodology used to identify suitable habitat**, simply restating the resulting conclusion does not resolve the methodological concern.



The Applicant needs to demonstrate that:

- the survey extent encompassed all areas potentially affected by the development;
- potentially suitable habitat was correctly identified;
- the grid connection route and associated wet grassland were adequately considered;
- areas containing Devil's-bit Scabious were appropriately evaluated; and
- potential indirect and connectivity effects were considered in determining the survey area and assessment methodology.

Without that information, the conclusion that the development lies outside suitable Marsh Fritillary habitat remains dependent upon the very habitat classification and survey methodology that the observations questioned.

Cumulative fragmentation requires consideration

The original observations also raised concerns regarding cumulative habitat fragmentation.

The Knockshanvo site exists within a landscape already substantially influenced by commercial forestry, forestry drainage and associated habitat modification.

The proposed development would introduce further roads, turbine infrastructure, drainage works, forestry removal and other physical changes.

For a species whose conservation is dependent upon the availability and connectivity of suitable habitat across the landscape, cumulative fragmentation is relevant even where individual areas of direct habitat loss may be limited.

The assessment should therefore consider whether the proposed development, together with existing forestry and other relevant developments and land-use pressures, could incrementally:

- reduce suitable habitat;
- increase separation between habitat patches;
- degrade potentially suitable connecting habitat; or
- reduce the ability of the wider habitat network to support Marsh Fritillary populations over time.



The Further Information does not clearly explain how these cumulative effects upon habitat connectivity have been assessed before concluding that significant effects will not occur.

The conclusion that no mitigation is required depends upon the preceding assessment

The Applicant concludes that no specific Marsh Fritillary mitigation is required because no significant effect has been identified.

That conclusion is necessarily dependent upon the completeness and reliability of the preceding assessment.

If potentially suitable habitat has been omitted, habitat connectivity has not been adequately evaluated, the grid connection route has not been fully assessed or indirect hydrological effects remain uncertain, the absence of identified significant effects cannot itself provide the justification for the absence of mitigation.

The sequence must be the reverse:

the potential effects must first be adequately identified and assessed before it can reliably be concluded that mitigation is unnecessary.

CLG Conclusion

The Applicant's Further Information provides additional explanation regarding Marsh Fritillary but does not, in the CLG's view, fully resolve the substantive concerns raised in the original observations.

In particular, uncertainty remains regarding:

- whether the assessment has adequately considered Marsh Fritillary ecology beyond the immediate construction footprint;
- the distribution and ecological significance of potentially suitable habitat containing Devil's-bit Scabious;
- potential habitat connectivity between suitable habitat patches;
- wet grassland and potentially suitable habitat associated with the proposed grid connection route;
- the potential for indirect hydrological effects upon adjoining habitat;
- the adequacy and extent of the survey methodology; and



- cumulative habitat fragmentation within a landscape already substantially affected by commercial forestry and drainage.

The CLG does not contend that every area containing Devil's-bit Scabious constitutes occupied breeding habitat, nor that the existence of potentially suitable habitat demonstrates that significant effects will necessarily occur.

The concern is that the Applicant's conclusion of no significant effect depends substantially upon the proposition that the development footprint lies outside suitable Marsh Fritillary habitat, while the wider questions of **habitat identification, connectivity, indirect effects and cumulative fragmentation remain insufficiently resolved.**

Accordingly, the CLG does not consider that the Further Information provides a sufficient basis for accepting the Applicant's conclusion that no Marsh Fritillary mitigation is required.

Before accepting a conclusion of no significant effect, the Commission should be satisfied that the full area potentially affected by the development, including the grid connection route and adjoining potentially suitable habitat, has been adequately surveyed and assessed and that potential effects upon habitat quality, hydrology and ecological connectivity have been appropriately considered.

Until those matters are resolved, the Applicant's conclusion that the proposed development will not result in significant effects upon Marsh Fritillary or the habitat network supporting the species has not, in the CLG's view, been adequately demonstrated.



6. Overall Conclusion and Request to the Commission



Overall Conclusion

The Applicant's Further Information is extensive and contains a significant volume of additional technical explanation, updated material and proposed mitigation.

East Clare Environment Protection CLG has reviewed that material against the wider planning record and has not sought to maintain objections where the Applicant has satisfactorily clarified or resolved a matter.

However, the Further Information does **not** resolve a number of issues which remain material to the Commission's determination of the proposed Knockshanvo Wind Farm.

In the CLG's submission, the most important unresolved matters relate to:

- aviation safeguarding;
- cumulative and piecemeal development within the Knockshanvo/Oatfield uplands;
- Hen Harrier and the adequacy of habitat compensation and enhancement;
- hydrology, peatland and water protection;
- landscape and visual effects; and
- cumulative operational noise and sensitive receptors.

These matters must be considered not only individually, but also in combination, because several of the Applicant's conclusions depend upon the same underlying assumptions concerning cumulative development, mitigation effectiveness and the availability of future technical solutions.

Aviation Safeguarding

The aviation issue remains the most significant unresolved constraint.

The Applicant has undertaken substantial additional technical work and has identified credible possible mitigation pathways in relation to both:

- Instrument Flight Procedures serving Shannon Airport; and
- the Woodcock Hill MSSR surveillance system.



However, the Further Information does not demonstrate a final, agreed and deliverable aviation solution.

The Applicant itself acknowledges that Turbines T01, T02 and T03 cannot presently be constructed consistently with the existing Instrument Flight Procedure environment and proposes that those turbines should await future redesign measures.

Similarly, the radar mitigation package remains dependent upon further technical assessment, further engagement with AirNav Ireland, potential radar optimisation or upgrades, possible additional surveillance infrastructure, system integration and subsequent safety and regulatory approval.

The distinction is therefore clear.

The Applicant has demonstrated that mitigation **may be technically possible**.

It has not demonstrated that mitigation has been **finally defined, validated, accepted and secured**.

That distinction is particularly important in light of the Commission's recent decision in relation to Ballycar Wind Farm, where the Commission was not satisfied that measurable, evidence-based, demonstrable and credible aviation mitigation had been provided which could be agreed and implemented to the satisfaction of the relevant aviation authorities.

The same fundamental issue remains at Knockshanvo.

In the absence of a defined aviation mitigation scheme accepted by the competent aviation bodies, the Commission would effectively be granting permission while leaving unresolved whether the development can ultimately coexist safely with established aviation infrastructure.

The CLG submits that this is not an appropriate matter to defer by planning condition.

Cumulative and Piecemeal Development

The relationship between Knockshanvo and Oatfield remains a central planning concern.



The Applicant relies upon the fact that the two projects are separate legal and planning entities. That is not disputed.

However, the environmental and planning consequences arise from the combined physical development of the same upland landscape.

If both projects proceed, the area would contain approximately 20 very large turbines in close proximity, together with associated roads, electrical infrastructure, forestry disturbance and construction activity.

The Commission must therefore assess the actual future receiving environment rather than allowing the separate planning identities of the projects to obscure their combined effects.

This is especially relevant to landscape, ecology, hydrology, noise and aviation.

The concern regarding piecemeal development is not resolved simply because cumulative assessments have been prepared. A cumulative assessment may identify combined effects, but it does not necessarily demonstrate that the overall development strategy represents the most coherent or environmentally appropriate use of the Strategic Area.

The CLG therefore considers that Clare County Council's concern regarding piecemeal development remains material.

Hen Harrier and Habitat Compensation

The Applicant relies heavily upon habitat compensation and enhancement measures to support its conclusion that significant residual and cumulative effects on Hen Harrier will not arise. The CLG accepts that appropriately designed and secured habitat management can provide genuine ecological benefit.

However, the adequacy of compensation depends first upon the **full functional habitat effect being correctly identified and quantified**. As addressed in Response 30, material uncertainty remains regarding the Applicant's **58.57 ha habitat-loss figure**, including its reliance upon assumed complete displacement within 250 m, the treatment of reduced Hen Harrier activity beyond that distance, the transferability of displacement evidence derived from substantially smaller turbines, and the changing location and connectivity of suitable habitat through the commercial forestry lifecycle.



These uncertainties are particularly important because the predicted adverse effects arise from a defined development, whereas the claimed benefits of compensation and enhancement depend upon future ecological outcomes, including successful habitat establishment and management, prey availability, functional connectivity and actual use of the lands by Hen Harrier.

The Commission should therefore be satisfied not only that the proposed compensation is **additional, functionally equivalent, timely, secure, ecologically effective and sufficient in the wider cumulative context**, but that it has been dimensioned against a robust and precautionary assessment of the underlying habitat effect in the first instance.

The Further Information does not, in the CLG's submission, provide sufficient certainty on either side of that equation: the full functional habitat effect remains uncertain, and the ecological outcome of the measures intended to compensate for that effect is itself dependent upon future performance.

Hydrology, Peatland and Water Protection

The proposed development involves substantial works within an upland peatland and commercial forestry environment.

The Applicant has proposed a detailed drainage and environmental-management strategy, but the CLG remains concerned that several critical conclusions depend upon the same hydrological assumptions.

These include conclusions relating to:

- private wells and drinking-water supplies;
- Gortacullin Bog NHA;
- peat stability;
- forestry felling;
- sediment and water-quality control; and
- Water Framework Directive compliance.



The Commission should be particularly cautious where a conclusion of no significant effect depends upon future monitoring or adaptive management.

Monitoring can verify performance. It cannot substitute for an adequate understanding of the receiving environment before development occurs.

The CLG therefore submits that the hydrological and peatland issues remain material, especially where the Applicant's own documentation identifies sensitive receptors close to the proposed works.

Landscape and Visual Effects

The proposed turbines are of exceptional scale and would materially alter the character of the 12 O'Clock Hills uplands.

The Applicant relies strongly upon the site's wind-energy policy designation and upon the capacity of the upland landscape to accommodate wind development.

However, strategic support for wind energy in principle does not determine the acceptability of this specific layout, turbine scale or cumulative development scenario.

The Applicant's own LVIA identifies significant effects at certain residential and landscape receptors.

The cumulative relationship with Oatfield is particularly important because both developments would occupy the same wider visual unit and would frequently be experienced together.

Accordingly, the relevant planning question is not simply whether Knockshanvo alone can be accommodated, but whether the resulting combined landscape can absorb the overall scale and density of development proposed.

The CLG submits that this remains unresolved.



Noise, Public Health and Sensitive Receptors

The Applicant has undertaken an extensive operational and cumulative noise assessment and relies upon established ETSU-R-97 and Institute of Acoustics methodology.

The CLG accepts that this is the conventional framework used for wind turbine noise assessment.

However, the Applicant's own baseline data demonstrate a very quiet existing rural acoustic environment.

The Commission should therefore consider not only numerical compliance, but the magnitude of change from baseline conditions.

This is particularly important where cumulative operation of Knockshanvo, Oatfield and other relevant wind farms may materially alter the existing acoustic environment.

The Sunyata Buddhist Retreat Centre requires particular consideration because tranquillity is integral to the established function of that receptor.

The CLG also considers that the HSE's public-health concerns and the relevance of more recent health-based evidence should not be dismissed merely because the 2006 Wind Energy Development Guidelines remain the applicable statutory planning guidance.

The Further Information Does Not Remove the Material Uncertainty

A recurring feature of the Applicant's Further Information is reliance upon measures that remain to be developed, implemented or verified in the future.

These include:

- future habitat-management outcomes;



- future ecological monitoring;
- future construction-stage verification;
- future IFP redesign;
- future radar optimisation or upgrades;
- future third-party agreements; and
- future regulatory or technical approvals.

Such measures may be appropriate where they relate to detailed implementation of an already established solution.

They are not sufficient where the unresolved matter concerns the fundamental environmental acceptability or technical feasibility of the development.

The Commission must therefore distinguish between mitigation that is **defined and secured** and mitigation that remains **prospective or conceptual**.

In the CLG's submission, too many of the critical issues remain dependent upon the latter.

Impact on the Local Community

The CLG also considers it important that the human dimension of this planning process is not lost within the extensive technical material before the Commission. The communities affected by Knockshanvo comprise ordinary rural residents, families, farmers and people working in the locality. Over a number of years, residents have been required to engage with successive and overlapping wind energy proposals affecting the same relatively small geographical area, including Knockshanvo, Oatfield and other developments within the wider East Clare uplands.

Meaningful participation in developments of this scale requires residents to review thousands of pages of technical documentation, understand complex specialist evidence, engage professional advisers and prepare detailed submissions such as this response. This work has been undertaken voluntarily by members of the community alongside employment, farming, family responsibilities and ordinary daily life. It has required a very substantial commitment of personal time and resources.

The cumulative effect of repeatedly having to engage with major development proposals affecting people's homes and surrounding environment has also created considerable



stress, uncertainty and disruption within the community. These impacts are real even though they are difficult to quantify within the conventional headings of an environmental assessment.

There is inevitably a substantial imbalance in resources between a local community participating voluntarily in the planning process and a commercial developer capable of retaining teams of planning, environmental, engineering and legal specialists. That makes it particularly important that detailed concerns raised by local residents are considered on their substance and are not afforded less weight simply because communities do not have equivalent professional or financial resources.

The CLG has nevertheless sought throughout this submission to engage with the Applicant's Further Information carefully, constructively and on the evidence. The extent of this response itself reflects both the complexity of the issues raised by the proposed development and the seriousness with which the local community regards its potential consequences.

The CLG respectfully asks the Commission, when considering the extensive technical record before it, not to lose sight of the people and communities who live within this landscape and who will experience the consequences of its decision long after the planning process itself has concluded.

Request to the Commission

Having regard to the entirety of the planning record, the Applicant's Further Information and the matters set out in this submission, East Clare Environment Protection CLG respectfully submits that the Applicant has not demonstrated that the proposed Knockshanvo Wind Farm can proceed without unresolved material effects upon the environment, residential amenity, protected ecological receptors and safety-critical aviation infrastructure.

Most significantly, the aviation safeguarding issues remain unresolved and are dependent upon future mitigation which has not been finally defined, validated, accepted or secured.

The cumulative implications of Knockshanvo and Oatfield, together with the remaining concerns regarding Hen Harrier, hydrology, peatland, landscape, noise and sensitive receptors, further weigh against a conclusion that the development is acceptable.



Accordingly, **East Clare Environment Protection CLG** respectfully requests that **An Coimisiún Pleanála** refuse permission for the proposed Knockshanvo Wind Farm.

Thank you for considering this detailed input.

Yours sincerely,

Submitted by:

East Clare Environment Protection CLG